शारीरिक शिक्षा
Physical Education

कक्षा / Class XII

2025-26

विद्यार्थी सहायक सामग्री
Student Support Material

केन्द्रीय विद्यालय संगठन~Kendriya Vidyalaya Sangathan

संदेश

विद्यालयी शिक्षा में शैक्षिक उत्कृष्टता प्राप्त करना एवं नवाचार द्वारा उच्च – नवीन मानक स्थापित करना केन्द्रीय विद्यालय संगठन की नियमित कार्यप्रणाली का अविभाज्य अंग है। राष्ट्रीय शिक्षा नीति 2020 एवं पी. एम. श्री विद्यालयों के निर्देशों का पालन करते हुए गतिविधि आधारित पठन-पाठन, अनुभवजन्य शिक्षण एवं कौशल विकास को समाहित कर, अपने विद्यालयों को हमने ज्ञान एवं खोज की अद्भुत प्रयोगशाला बना दिया है। माध्यमिक स्तर तक पहुँच कर हमारे विद्यार्थी सैद्धांतिक समझ के साथ-साथ, रचनात्मक – विशेषणात्मक एवं आलोचनात्मक चिंतन भी विकसित कर लेते हैं। यही कारण है कि वह बोर्ड कक्षाओं के दौरान विभिन्न प्रकार के मूल्यांकनों के लिए सहजता से तैयार रहते हैं।उनकी इस यात्रा में हमारा सतत योगदान एवं सहयोग आवश्यक है - केन्द्रीय विद्यालय संगठन के पांचों आंचलिक शिक्षा एवं प्रशिक्षण संस्थान द्वारा संकलित यह विद्यार्थी सहायक- सामग्री इसी दिशा में एक आवश्यक कदम है । यह सहायक सामाग्री कक्षा 9 से 12 के विद्यार्थियों के लिए सभी महत्वपूर्ण विषयों पर तैयार की गयी है। केन्द्रीय विद्यालय संगठन की विद्यार्थी सहायक- सामग्री अपनी गुणवत्ता एवं परीक्षा संबंधी - सामग्री संकलन की विशेषज्ञता के लिए जानी जाती है और शिक्षा से जुड़े विभिन्न मंचों पर इसकी सराहना होती रही है। मुझे विश्वास है कि यह सहायक सामग्री विद्यार्थियों की सहयोगी बनकर निरंतर मार्गदर्शन करते हुए उन्हें सफलता के लक्ष्य तक पहुँचाएगी।
शुभाकांक्षा सहित ।

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CBSE SYLLABUS 2025-26

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UNIT-1
MANAGAMENT OF SPORTING EVENTS

CONTENT:

• Aspects /steps of Sports Events' Management (Planning, Organising, Staffing, Directing & Controlling)

• Various Committees & their Responsibilities (pre, during & post)

• Fixtures and their Procedures – Knock-Out (Bye & Seeding) & League (Staircase, Cyclic, Tabular MethoD) and Combination Tournament

• Intramural & Extramural tournaments – Meaning, Objectives & Its Significance

• Community sports program (Sports Day, Health Run, Run for Fun, Run for Specific Cause & Run for Unity)

LEARNING OBJECTIVES

- To make the students understand the need and meaning of planning in sports, committees, and their responsibilities for conducting the sports event or tournament.

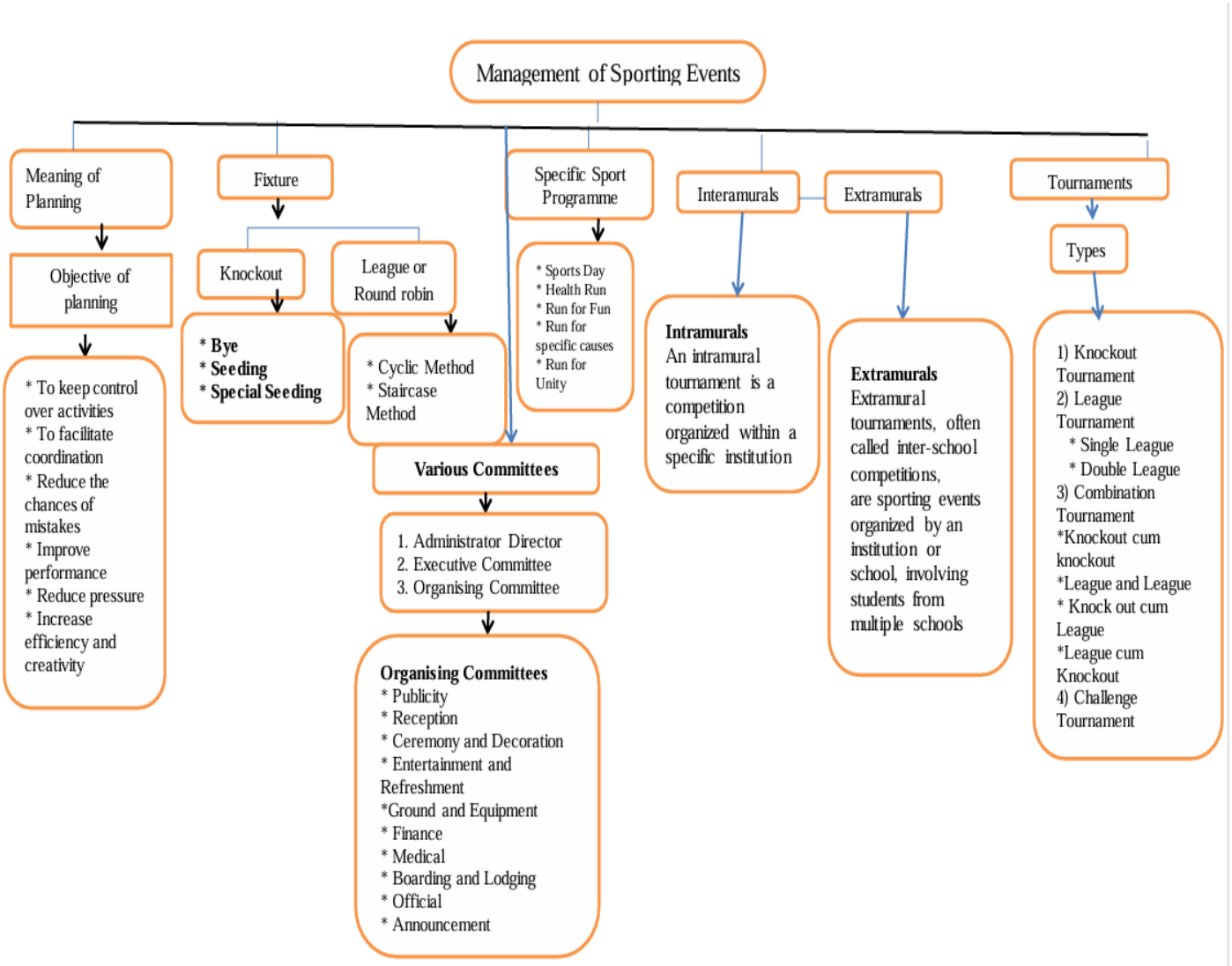
- To teach them about the different types of tournaments and the detailed procedure of drawing fixtures for Knock Out, League Tournaments, and Combination tournaments.
- To make the students understand the need for the meaning and significance of intramural and extramural tournaments
- To teach them about the different types of community sports and their importance in our society.

LEARNING OUTCOMES

1. Describe the functions of Sports Event management.
2. Classify the committees and their responsibilities in sports events.
3. Differentiate between various kinds of tournaments.
4. Prepare fixtures of knockout, league & combination.
5. Distinguish between intramural and extramural sports events.
6. Design and prepare for different types of community sports events.

MIND MAP

Marks Weightage – 5+4b* Marks



1.1 Functions of Sports Events Management
(Planning, Organizing, Staffing, Directing & Controlling)

FUNCTIONS	CHARACTERISTICS
PLANNING	Planning is deciding in advance what needs to be done in order to achieve specific objectives. Proper planning enables the individual to achieve the goal with ease and results are thus assured.
ORGANISING	Organising is the process of implementation of the plan to achieve the specific goal. It involves identification of people and facilities.
STAFFING	It is to identify appropriate people for suitable works to achieve goals.
DIRECTING	To motivate, guide, supervise and lead people to give their best for achieving the goal.
CONTROLLING	Planning and control are closely connected. Effective planning keeps good control over the activities.

1.2 Various Committees & their Responsibilities - (PRE, DURING & POST)

To conduct/manage the Sports Events successfully, the formation of Committees is very important.

These committees have the responsibility to do the required , for the successful conduct of Sports

Events. Basically, these can be divided into three parts-Pre-tournament/ Sports event, During tournament and Post/after tournament.

COMMITTEES	RESPONSIBILITES		
	PRE-TOURNAMENT	**DURING-TOURNAMENT**	**POST-TOURNAMENT**
ORGANISING COMMITTEE	The Organizing Committee in sports management is responsible for the overall planning, coordination, and execution of sports events. This includes creating a schedule, managing logistics, securing venues, handling finances, and ensuring the smooth operation of all aspects of the event. It takes care of all the pre, during and after the sports event jobs.		
REGISTRATION COMMITTEE	The Registration Committee will register the participants.		
TRANSPORTATION COMMITTEE	To receive the out-station teams from the bus station/ railway station to the venue of their stay	If there is considerable distance between the stay and play venues, transportation committee makes transport arrangements.	After the completion of the tournaments and closing ceremony, the committee arranges the transport of students from the venue of their stay to the bus/railway station.
Finance Committee	Budget preparation, sponsorship management, and financial oversight during the event. They purchase necessary equipment, stationery, and other materials required for the event. They ensure that sufficient funds are available for all aspects of the event.	They track the inflow and outflow of funds, including payments to officials and vendors	They prepare a comprehensive financial report summarizing the event's finances. They review all bills and accounts to ensure accurate financial records. They finalize all financial matters related to the event and submit the same to the Organizing Committee.

Technical Committee	Ensuring the smooth and fair conduct of events by managing technical aspects like preparation of fixtures, draws, officiating, and result compilation. They also handle tasks like procuring equipment and confirming the officials. To conduct meeting of officials with participating managers to discuss the rules and regulations of tournament/ sports meet.	They appoint and supervise officials like referees, umpires, and judges, ensuring they are competent and qualified. They collect and compile results from officials, ensuring accuracy and fairness. They are responsible for procuring and ensuring the availability of necessary equipment, as well as the layout and condition of the venue.	They collect and compile results from officials, ensuring accuracy and fairness. To handover the results of the Sports meet to the Organizing Committee.
Boarding and Lodging Committee	To keep stay arrangements ready, Distribution of material for Stay and Preparation of Menu.	To see that the Menu is maintained properly, to serve hygienic food to the participants and to ensure the timely arrangement of food and the maintenance of cleanliness.	Collecting the materials issued for the participants' stay ,back from them
Inauguration & Valedictory and Prize Distribution Committee	This committee is responsible for planning and executing the opening ceremony, which typically includes a welcome speech, the lighting of a lamp or torch, and the oath-taking ceremony for participants.	The committee ensures that all logistical aspects of the ceremonies are well-managed, including venue arrangements, decorations, refreshments, entertainment, and security.	The committee also plans and organizes the closing ceremony, which marks the end of the sports activities and often includes a speech by the principal, a presentation of awards, and a thank you note to the participants and organizers. This committee is responsible for arranging the

			presentation of prizes and certificates to the winners and participants.
JURY OF APPEAL	This committee is constituted by head of the Organizing committee, chief referee and members of the Organizing committee to resolve a the protests if any.		

1.3 Fixtures and their Procedures – Knock-Out (Bye & Seeding) & League (Staircase, Cyclic, Tabular method) and Combination tournaments.

TYPES OF TOURNAMENT

1.3.1 KNOCK OUT:

A knockout tournament is a type of competition where a team or player is eliminated from the tournament after losing a match. Only the winners move to the next round, and this continues until a final winner is decided.

Example:

If 8 teams are playing, after the first round 4 teams remain, then 2, and finally 1 winner.

This is also called as Elimination Tournament.

Advantages of Knockout Tournaments:

1. **Simple Structure**: Easy to run and follow, with players eliminated at each round.
2. **High Stakes**: Every match matters—one loss and you're out.
3. **Clear Winner**: The champion is decided by direct wins over others.
4. **Exciting to Watch**: Every match is important and engaging.
5. **Versatile Format**: Works for sports, games, and academic contests.
6. **Time-Efficient**: Fewer matches mean faster results.

Disadvantages of Knockout Tournaments:

1. **One Bad Day Ends It**: A single mistake or injury can knock out even the best players.
2. **Unfair Matchups**: Strong teams might face weak ones early, making games less exciting.
3. **Early Exits**: Top players can be eliminated too soon by chance or bad luck.
4. **No Second Chance**: There's no way to recover from an early loss.

5. **Focus on One Game**: Success depends on single matches, not consistent performance.
6. **Eliminated Means Out**: Once out, players have no more role, which can reduce fan interest.
7. **Seeding Issues**: Poor seeding can lead to unfair matchups and early exits for top contenders.

STEPS/FORMULA TO DRAW FIXTURES USING KNOCK-OUT TABLE

		No.of Matches	No.of Rounds	Teams in Upper Half	Teams in Lower Half	Byes
Knockout Tournament	**Knockout - Odd**	**N - 1**	**k**	$\frac{(N+1)}{2}$	$\frac{(N-1)}{2}$	$2^k - N$
	Knockout - Even	**N - 1**	**k**	$\frac{(N)}{2}$	$\frac{(N)}{2}$	$2^k - N$
		Where k is the next highest power of 2, such that $2^k > N > 2^{k-1}$				

Example:

In school intramural, 9 kabaddi teams are going to participate in a knockout tournament. Draw the fixtures for the 9 teams with proper calculation

Steps:

1.To Calculate total number of Matches = (N-1) = 9 -1 = 8 matches

2. To Calculate Number of Rounds = Number of Rounds = K

(Where K is the Next highest Power of 2, such that ***the next power of two is 16 for 9 teams that is***

2x2x2x2= 16: $2^k = 2^4$ ***= 4 rounds***

Number of rounds = [$2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$],

$16 \geq N > 8$, So, $K = 4$

3. Total Number of halves = 2 (One is Upper half and other is Lower half)

4. To divide the Number of Teams for Upper half and Lower half we need to apply the following formula:

A) Number of Teams in Upper Half (If the Number of the participating Teams are in Odd Number) = (N+1)/2 =**9+1/2 = 5**

B) Number of Teams in Lower Half (If the Number of the participating Teams are in Odd Number) = (N-1)/2 = **9-1/2= 4**

5.To Calculate the Number of Byes in the Entire Fixtures/tournament = 2k (Next power of two total participating teams) – N (Number of teams participating) = **16-9= 7 byes**

6. To Calculate the Number of Byes in the Upper Half = NB (Total Number of Byes) -1/2 = **7-1/2=3**

7. To Calculate the Number of Byes in the Lower Half = NB (Total Number of Byes) + 1 /2 = **7+1/2=4**

8.The Sequence of Allocation/arrangement of Byes in Fixtures –

A) 1st Bye – Last team in Lower Half

B) 2nd Bye – First team in Upper Half

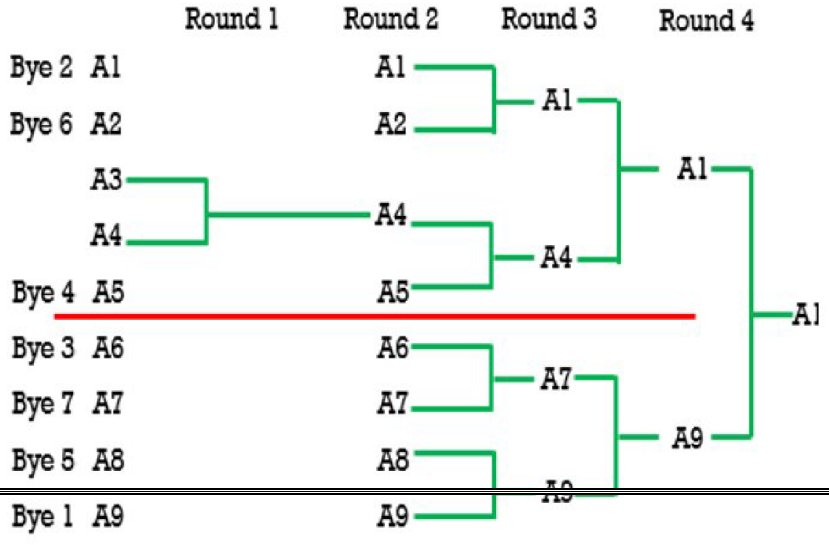
C) 3rd Bye –First team in Lower Half

D) 4th Bye – Last team in Upper Half.

e) 5th Bye – Second Last team of the lower Half.

f) 6th Bye- Second team in Upper Half

g) 7th Bye – Second upper team of the lower Half



Example 2:
In Inter district Tournament, 10 kabaddi teams are going to participate in a knockout tournament. Draw the fixtures for the 10 teams with proper calculation

Steps:

1.To Calculate total number of Matches = (N-1) = 10 -1 = 9 matches

2. To Calculate Number of Rounds = Number of Rounds = K

(Where K is the Next highest Power of 2, such that ***the next power of two is 16 for 10 teams that is***

2x2x2x2= 16: $2^k = 2^4 =$ ***4 rounds***

Number of rounds = [$2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$],

$16 \geq N > 8$, So, $K = 4$

3. Total Number of halves = 2 (One is Upper half and other is Lower half)

4. To divide the Number of Teams for Upper half and Lower half we need to apply the following formula:

A) Number of Teams in Upper Half (If the Number of the participating Teams are in even Number) = N/2 **=10/2 = 5**

B) Number of Teams in Lower Half (If the Number the participating Teams are in even Number) = N/2 **= 10/2= 5**

5.To Calculate the Number of Byes in the Entire Fixtures/tournament = 2k (Next power of two total participating teams) – N (Number of teams participating) =**16-10= 6 byes**

6. To Calculate the Number of Byes in the Upper Half = NB /2 = **6/2=3**

7. To Calculate the Number of Byes in the Lower Half = NB /2 = **6/2=3**

8.The Sequence of Allocation/arrangement of Byes in Fixtures –

A) 1st Bye – Last team in Lower Half

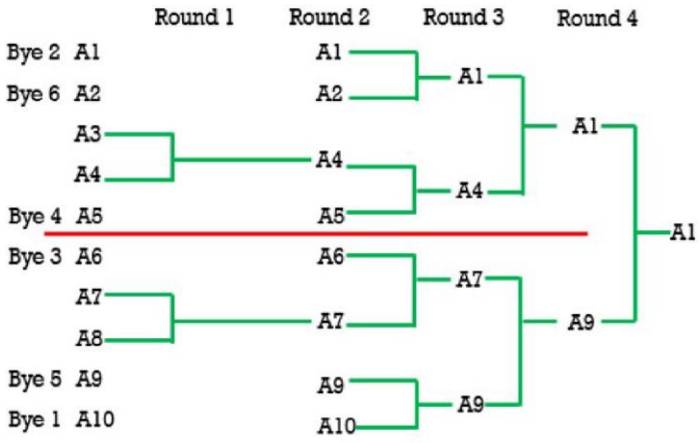
B) 2nd Bye – First team in Upper Half

C) 3rd Bye –First team in Lower Half

D) 4th Bye – Last team in Upper Half.

e) 5th Bye – Second Last team of the lower Half.

f) 6th Bye- Second team in Upper Half



1. Seeding-

- **Definition**: Seeding is the process of arranging top players or teams in a Knock out tournament so they do not meet in the early rounds.
- **Purpose**: To ensure that the best competitors don't eliminate each other early.
- **Basis**: Rankings, past performances, or selection committee decisions.

2. Bye

Definition: A "bye" allows a player or team to automatically advance to the next round / /play the second round directly without playing in the first round.

- **When Used**: Given when the number of participants is not a power of 2.
- **Usually Awarded To**: Higher-seeded players or top seeded players.

3. Special Seeding

- **Definition**: A provision to allow certain players or teams to enter or directly play the Quarter or Semi Final in the tournament or at a specific stage.
- **Examples**:
  - ✓ Defending champions
  - ✓ Top-ranked players returning from injury
- **Purpose**: To maintain competitive balance and fairness.

1.3.2 LEAGUE TOURNAMENT FIXTURE (SINGLE LEAGUE) FORMULA SUMMARY

		No. of Matches	No. of Rounds
League Tournament	**Cyclic & Staircase (OdD)**	$\frac{N(N-1)}{2}$	**N**
	Cyclic & Staircase (Even)	$\frac{N(N-1)}{2}$	**N-1**

A league tournament is a type of competition where all participants or teams compete against each other in a series of matches, often over a prolonged period. Unlike knockout tournaments where players or teams are eliminated after a loss, a league tournament allows participants to play a set number of matches, typically against every other competitor. The overall winner is determined by the total points or wins accumulated across all rounds, rather than through a single-elimination format.

There are two types of league tournaments

1. **Single league Tournaments:**
   Every team (or participant) plays once against every other team in the competition
2. **Double league Tournaments**
   Every team (or participant) plays twice against every other team in the competition

There are 3 types of fixtures in league tournaments

1.Staircase Method

2. Cyclic Method.

3.Tabular Method

STEPS TO DRAW FIXTURE USING CYCLIC METHOD
(EVEN NUMBER OF TEAMS)

Number of matches $= \frac{N(N-1)}{2}$

Number of Rounds = N-1

Example: Drawing a Fixture of 6 teams

Number of Matches $= \frac{N(N-1)}{2} = \frac{6(6-1)}{2}$ = 15 Matches

Number of Rounds = N-1 = 6 – 1 = 5 Rounds

Round 1	Round 2	Round 3	Round 4	Round 5
A6 — A1	A5 — A1	A4 — A1	A3 — A1	A2 — A1
A5 — A2	A4 — A6	A3 — A5	A2 — A4	A6 — A3
A4 — A3	A3 — A2	A2 — A6	A6 — A5	A5 — A4

STEPS TO DRAW FIXTURE USING CYCLIC METHOD FOR 5 TEAMS
(ODD NUMBER OF TEAMS)

Number of matches $= \frac{N(N-1)}{2}$

Number of Rounds = N

Example: Drawing a Fixture of 5 teams

Number of Matches = $\frac{N(N-1)}{2} = \frac{5(5-1)}{2}$ = 10 Matches

Number of Rounds = N = 5 = 5 Rounds

Round 1	Round 2	Round 3	Round 4	Round 5
A5 — Bye	A4 — Bye	A3 — Bye	A2 — Bye	A1 — Bye
A4 — A1	A3 — A5	A2 — A4	A1 — A3	A5 — A2
A3 — A2	A2 — A1	A1 — A5	A5 — A4	A4 — A3

STEPS TO DRAW FIXTURE USING CYCLIC METHOD
(EVEN NUMBER OF 06 TEAMS)

Number of matches $= \frac{N(N-1)}{2}$

Number of Rounds = N

Example: Drawing a Fixture of 5 teams

Number of Matches = $\frac{N(N-1)}{2} = \frac{6(6-1)}{2}$ = 15 Matches

Number of Rounds = N; N = 5; = 5 Rounds

ROUND 1	ROUND 2	ROUND 3	ROUND 4	ROUND 5
A6-A1	A5-A1	A4-A1	A3-A1	A2-A1
A5-A2	A4-A6	A3-A5	A2-A4	A6-A3

A4-A3	A3-A2	A2-A6	A6-A5	A5-A4

STEPS TO DRAW FIXTURE USING STAIRCASE METHOD

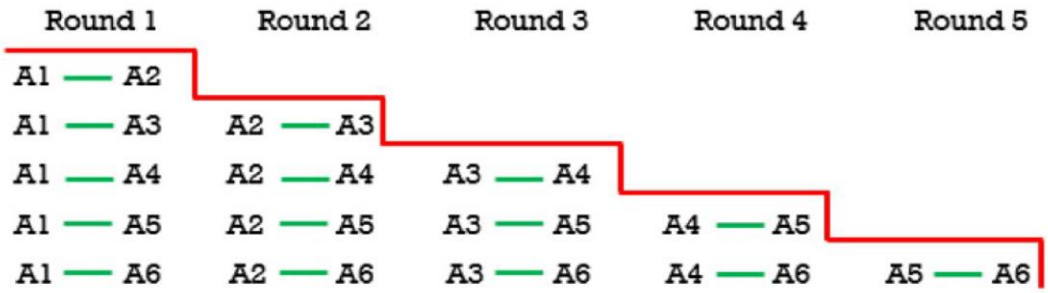
Number of matches $= \frac{N(N-1)}{2}$

Number of Rounds = N-1

Example: Drawing a Fixture of 6 teams

Number of Matches = $\frac{N(N-1)}{2} = \frac{6(6-1)}{2}$ = 15 Matches

Number of Rounds = N-1 = 6 – 1 = 5 Rounds



1.3.3 COMBINMATION TOURNAMENTS

In sports and competitions, combination tournaments are formats that mix two or more basic types of tournament structures (like knockout, league, or round-robin). This helps accommodate a large number of teams, time constraints, and fairness requirements.

Types of Combination Tournaments:

There are four types of combination Tournaments

1. Knockout cum League Tournament

Description: Teams are first divided into groups (league format), and the top teams qualify for a knockout stage.

Example: FIFA World Cup.

2. League cum Knockout Tournament

Description: All teams first play a full league. The top teams then enter a knockout stage to determine the final winner.

Example: Some cricket tournaments like IPL (Indian Premier League).

3. **Knockout cum Knockout Tournament**

Description: An initial knockout stage is followed by another knockout stage with winners from the first.

Used when: There's a need to filter many teams quickly, then ensure high competitiveness in the final rounds.

4. **League cum League Tournament**

Description: Teams are divided into groups, each playing a league format. The top teams from each group form a new group and play another league.

Example: Used in some zonal level sports meets.

1.4. Intramural & Extramural tournaments – Meaning, Objectives & Its Significance

TYPE	MEANING	OBJECTIVE	SIGNIFICANCE
Intramural	An intramural tournament is a competition organized within a specific institution, like a school or university, where participants are all members of that same institution	They are to identify the skill and to measure the physical fitness levels of the participants. They aim to create an atmosphere conducive to the promotion of sports in the institution.	They promote fun, physical activity, and social interaction among the participants. Intramural programs can offer a wide range of sports, from popular choices like basketball and volleyball to more unique activities like dodge ball or even trivia competitions.

Extramural	Extramural tournaments, often called inter-school competitions, are sporting events organized by an institution or school, involving students from multiple schools	They provide a platform for a larger number of students to participate in sports and experience the thrill of competitive play. The competitions foster a sense of fair play and sportsmanship among the participating students. Extramural tournaments give exposure and opportunity to participants to understand their own capabilities and to improve themselves.	They offer opportunities for students to showcase their talent, - learn new techniques, and contribute to their institution's reputation - development of leadership and teamwork, developing social interaction.

1.5. Community sports program (Sports Day, Health Run, Run for Fun, Run for Specific Cause & Run for Unity):

Community Sports Programs are basically designed for recreation and they aim to bring awareness about social and health issues of the society. These programs can also play a significant role in fostering social cohesion and addressing social inequalities by targeting underrepresented groups.

1.Sports Day: Generally, Sports Day is conducted in Educational Organizations as the culmination of sports activities in that particular academic year. Or Sports day can be conducted to bring the community together through a day of recreational sports and games.

Significance: Develops an environment conducive to the promotion of sports in an organization, fosters community bonding and social cohesion.

2.Health Run: A health run is a community event designed to promote health and fitness through running or walking.

Significance: Health Run encourages people to adopt healthy life style and helps create awareness about the specific health issues.

3.Run for Fun: Run for Fun is a recreational physical activity for enjoyment which helps in maintaining physical and mental health.

Significance: A fun run is a friendly race that involves either road running or cross country running with participants taking part for their own enjoyment rather than for competition.

4.Run for Specific Cause: "Running for a specific cause" refers to participating in a run or race to raise awareness and funds for a particular issue or charity.

Significance: It develops social awareness, helps to raise funds for a particular charity or issue. Develops community health.

5. Run for Unity: Runs for unity can be organized to maintain or develop peace and harmony among the community and to promote national or international integration and brotherhood.

Significance: Run for Unity is not only promotes social cohesion but also encourages progress and development.

MULTIPLE CHOICE QUESTIONS – 1 Mark

1) The total number of matches in a knockout tournament for 34 teams are_____

(A) 31 (B) 32 (C) 33 (D) 35

Answer : (C)

2) What is the formula to calculate the number of matches in a single league tournament?

(A) N-1 (B) N(N-1). (C) N(N-1)/2 (D) 2N-N

Answer : (C)

3) Which one of the following is an advantage of the Round Robin Tournament?

(A) Time consuming (B) More number of officials

(C) Expensive. (D) Decides the real strong team

Answer : (D)

4) When a team is directly participating in quarter/semi-final due to its win in previous Tournament,is known as _____

(A) seeding (B) bye (C) robin round (D) Special seeding

Answer : (D)

5) Which among the following are the parts of sports management?

(A) Planning (B) Organizing and staffing

(C) Directing and controlling (D) All of the above

Answer : (D)

6) Pre-Tournament works of organising secretary are.

(A) Good planning (B) Staff grouping and their cooperation

(C)Raising funds (D) All of the above

Answer : (D)

7) In knockout tournament teams have to

(A) Play a large number of matches (B) play till they are winning

(C) Gets bye (D) play one match

Answer : (B)

8) Planning should be

(A) Specific (B) Logical (C) Flexible (D) All of the above

Answer : (D)

9) Publishing rules and regulations for the tournament is ……tournament work.

(A) Pre (B) During (C) post (D) any time

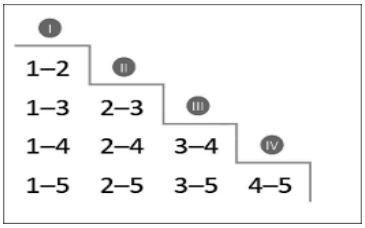
Answer : (A)

10) Schedule of the tournaments is also named as……

(A) Seeding (B) Fixture (C) Heat (D) All of the above

Answer : (B)

11)



The above table is related to _____

(A) Knockout Fixture (B) League Fixture

(C) Combination Fixture (D) None of the Above

Answer : (B)

12) What is the formula for calculating number matches in a single knock out tournament ?

(A) 2N-1 (B) N-1 (C) N-2 (D) N-3

Answer : (B)

13) Seeding method helps in elimination of……..

(A) Weak team (B) Strong team (C) Favorite team (D) Local team

Answer : (A)

14) Umpires, Referees, Recorders and Time Keepers are part of…….

(A) Organising committee (B) Ground Arrangement committee .

(C) Technical committee (D) Reception committee

Answer : (C)

15) The number of Bye's in knockout fixture of 71 teams is……

(A) 71 (B) 57 (C) 128 (D) 70

Answer : (B)

16) What is the first step in organizing a sports event?

A. Selection of teams B. Formation of committees
C. Budget preparation D. Fixing the venue

17) _____ committee is responsible for arranging trophies and certificates.

A. Transport committee B. Reception committee
C. Prize distribution committee D. Boarding and lodging committee

18) The Tournament where the number of matches are less____

A. Knock-out B. League
C. Round robin D. Challenge

19) What does the term 'fixture' mean in sports event management?

A. Arrangement of food B. Schedule of matches
C. List of officials D. Rules of the game

20) In a league tournament with 6 teams, how many total matches will be played (single league)?

A. 15 B. 6 C. 30 D. 12

VERY SHORT ANSWERS -2 MARKS

1) What is planning in games and sports?

Answer: Planning is a process of development of a strategy to achieve desired objectives, to solve problems and to facilitate action. With the help of appropriate planning in the field of games and sports, even some hitherto unachievable tasks can be achieved.

2) What are knock-out tournaments?

Answer: This type of tournament is also known as elimination tournament. In this type of tournament, loser of each bracket is immediately eliminated from the tournament.

3) What is bye?

Answer: Bye is a privilege given to a team which is decided generally by seeding it or by draw of lots. The team which gets bye will directly go to the second round.

4) What do you mean by extramural?

Answer: Extramural means 'between institutions' or we can say that these competitions are conducted between the players of two or more institutions.

5) Mention any four specific types of sports programs.

Answer: Specific sports programs are

1. Health run 2. Run For fun 3. Run for specific cause 4. Run for unity

6) What is meant by 'fixture' in sports events?

Answer: In sports events, fixture refers to a scheduled match or game between teams or individual competitors. It includes the **date, time, and venue** where the event will take place.

7) What are the two objectives of intramurals?

Answer:1. To provide incentive, motivation and opportunity to learn various skills.

2. To develop sportsman spirit among students.

8) What do you mean by league tournament?

Answer: A league tournament is also known as round robin tournament. In this type of tournament, each contestant meets all other contestants in turn.

9) Explain the staircase method of a League Tournament.

Answer: In staircase method, fixtures are made just like a ladder or staircase. This method is the easiest method because no bye is given to any team and there is no need of the stipulation of odd or even number of teams.

10) Why budget is important in sports event management?

Answer: Budgeting acts as a financial roadmap, ensuring the sports event runs smoothly, meets its objectives, and remains financially sustainable.

11) Mention one major responsibility of the organizing committee.

12) What is the role of the technical committee in a sports event?

13) What is seeding in sports tournaments?

14) What is the main objective of a sports event?

15) Mention any three Pre – Tournament duties of an Organization?

SHORT ANSWER QUESTIONS -3 MARKS

1) Write the names of various committees.

Answer : Arrangement Committee, Technical Committee, Discipline Committee, Reception Committee, Boarding and Lodging Committee, Certificate Writing

Committee, Medical Committee, Announcement Committee, Recorders and Bulletin Board Committee.

2) Mention any two advantages of conducting tournaments.

Answer : The two advantages of conducting tournaments are

1. Source of Recreation. A large number of people go to watch various games and sports for getting recreation. Sports tournaments provide ample recreation to the spectators.

2.Development of Social Qualities. Social qualities such as cooperation, tolerance, sympathy, group cohesion, brotherhood and discipline are developed among participants through sports tournaments

3) What are the advantages of knock-out tournaments?

Answer: Advantages of knock-out tournaments are

- ✓ Minimum number of officials are required in organising tournaments.
- ✓ Less number of matches are played, thus requiring less time to complete the tournaments.
- ✓ It helps in enhancing the standard of sports

4) Draw the rough work/ steps to be prepared to draw a Knock-out fixture for 7 (seven) teams.

Answer: Total number of matches = N -1 = 7 -1 = 6

Number of teams in upper half =N+1/2=7+1/2=8/2=4 teams

Number of teams in lower half

=N−1/2=7−1/2=6/2=3 teams

Total number of byes = Next power of two – Total teams = 8 – 7 = 1 bye

5) Briefly explain types of league tournaments.

Answer: There are two types of league tournaments

* Single League Tournament In single league, every team plays with every other team once.

Number of matches =N(N−1)//2

(N=number of teams)

* Double League Tournament In double league, every team plays with every other team twice.

Number of matches =N(N—1) (IV= number of teams).

6) Briefly mention the objectives of intramurals.

Answer: The objectives of intramurals are

1.To provide incentive, motivation and opportunity to learn various skills.
2.To develop sportsman spirit among students.
3.To help in recreation of the students.
4.To improve social interaction among the students.

7) What is the meaning of management in sports?

Answer: Management in sports refers to the process of planning, organizing, directing, and controlling the activities and resources involved in sports events. It ensures the efficient and smooth functioning of sports activities to achieve specific objectives.

8) List any three objectives of sports event management.

Answer: Three main objectives of sports event management are:

1. To ensure the smooth and successful conduct of the event.
2. To promote maximum participation and fair play.
3. To manage resources such as time, equipment, and manpower efficiently.

9) Name any three types of sports tournaments.

Answer: Three common types of sports tournaments are:

1. Knock-out tournament
2. League or round-robin tournament
3. Combination tournament (e.g., Knock-out + League)

10) Mention three committees formed for organizing a sports event.

Answer: Three important committees formed for organizing a sports event are:

1. Reception Committee
2. Technical Committee
3. Transport Committee

11) What are the responsibilities of the technical committee in a sports event?

12) Discuss any three challenges commonly faced during the organization of large-scale sports events and suggest solutions.

13) Draw the fixtures for 7 (seven) teams in a Single League tournament?

14) What are the major committees formed for organizing a sports event? Briefly describe the role of any two.

15) What is a fixture? Describe any method used for drawing fixtures in knockout tournaments.

CASE STUDY QUESTIONS- 4 MARKS

1.Sunrise Public School is going to organize its Annual Athletic Meet. Ms. Anita Sharma, the Physical Education teacher, is in charge of planning and executing the event. To ensure smooth functioning, she decides to form various committees with specific responsibilities before, during, and after the event.

(1) Which committee is mainly responsible for collecting entries and preparing list of participants before the event?
(A) First Aid Committee (B) Registration Committee
(C) Prize Distribution Committee (D) Transport Committee

Answer: (B) Registration Committee

(2) Which committee ensures smooth conduct of events on the ground during the sports day?
(A) Decoration Committee (B) Registration Committee
(C) Officials Committee (D) Announcement Committee

Answer: (C) Officials Committee

(3) After the completion of Sports Day, which committee ensures distribution of medals and certificates to the winners?
(A) Officials Committee (B) Awards Committee
(C) First Aid Committee (D) Discipline Committee

Answer: (B) Awards Committee

(4) Which committee is responsible for making the event schedule or match fixtures?
(A) Welcome Committee (B) Fixtures Committee
(C) Registration Committee (D) Transport Committee

Answer: (B) Fixtures Committee

2) Mr. Dinesh Kumar is the Physical Education teacher in a well-known high school. He has to organise the Sports Day in his school with the help of other teachers and students. Based on the case answer the given question.

(1) Name the important committee required by Mr. Dinesh.
(A) Technical & Ground Arrangement (B) Finance and Announcement
(C) Accreditation & Ceremonial **(D) All of the above**

(2) Identify the role played by Mr. Dinesh in organizing Sports Day.
(A) President of Tournament **(B) Organising Secretary**

(C) Coordinator of Tournament (D) Announcement in charge

(3) What is the main purpose of Sports Day ?

(A) Mass participation (B) Finding new, talented students

(C) To improve socialisation **(D) All of the above**

(4) Medals distribution arrangements will be done by_____

(a) prize distribution committee (B) opening Ceremonial

(C) Coordinator of Tournament (D) All of the above

3) ABC School has been given the responsibility to conduct a CBSE Zonal Volleyball competition. A group of students are volunteered to help the teacher in charge. Based on the case answer the given question

(1) To help the teams and to check their food and stay arrangements, a group of students will be assigned with the-------- committee.

(A) Transport **(B) Boarding and lodging** (C) Registration (D) Decoration

(2) Students good at art and craft and creative designing will be assigned with------- committee

(A) Reception **(B) Decoration** (C) Entertainment (D) Registration

(3)A few students will be assigned as_____ during the sports meet for helping the participants in various things

(A) Reception (B) Transport (C) Registration **(D) Volunteers**

(4) When we have a large number of entries, mention which kind of tournament can be conducted to complete it in the stipulated time?

(A) Knock-out tournament (B) League (C) Combination (D) Challenge

4) Your school has received an invitation for participation in a Badminton competition being organized by XYZ School. There is an entry fee for the competition due to which very few students have shown their willingness to participate. Based on the case answer the given questions.

(1) Which is the type of fixture preferred if there are a smaller number of teams?

(A) Knock-out/Elimination. (B) Seeding (C)Challenge. (D) League

(2) What are the advantages of using this particular fixture?

(A) More time consuming (B) less expenditure.

(C) More opportunities (D) Both (B) and (C)

(3) What are the possible causes for the lack of interest among students?

(A) More time consuming (B) Details not specified
(C) Poor communication. (D) All of the above

(4) Whom will you nominate as the Organising secretary of the meet?

(A) Physical education teacher (B) chief of technical committee
(C) Principal of the School (D) Teacher from school

5. Suppose you are the event manager for a school sports tournament, describe how you would handle the event of a sudden downpour during the sports event, ensuring the safety of participants and spectators.

1. As the event manager, what should be your *first* priority during a sudden shower at the sports tournament?

A) Announce the winners immediately
B) Ensure safety of participants and spectators
C) Distribute refreshments
D) Continue the event as scheduled

2. Which action would be most appropriate to protect electrical equipment during a rain shower?

A) Move equipment indoors or cover it with waterproof material
B) Turn up the volume to alert people
C) Leave it in place and hope the rain stops
D) Assign students to hold umbrellas over it

3. How should you communicate the emergency plan during the rain?

A) Only inform the teachers
B) Shout instructions from the centre of the field
C) Use a public address system or loudspeaker
D) Wait until the rain stops to give instructions

4. After moving people to shelter, what should be your next step?

A) Cancel the entire tournament
B) Start a different event indoors
C) Assess weather conditions and plan accordingly
D) Ask participants to leave immediately

6.A school is planning to organize a Health Run to promote physical activity and health awareness. Describe the steps you would take to plan and execute the event successfully.

1. What should be the *first* step in organizing a successful Health Run at school?

A) Distribute certificates
B) Promote the event on social media
C) Form a planning committee
D) Start registering participants

2. Why is it important to plan a safe and well-marked route for the Health Run?

A) To impress the local authorities
B) To prevent participants from getting lost or injured
C) To increase the length of the run
D) To make the event more competitive

3. Which of the following is essential to ensure participants' health and safety during the run?

A) Free snacks at the end
B) Providing first-aid support and water stations
C) Inviting media coverage
D) Giving prizes to all runners

4. How can you effectively spread awareness about the upcoming Health Run?

A) Keep it a surprise
B) Share details only with teachers
C) Promote it through posters and announcements
D) Avoid telling parents to limit the crowd

LONG ANSWER QUESTIONS - 5 Marks

1) You are the sports captain of the school. Prepare five important committees to conduct a one day 'Run for Health' race. Mention their individual responsibilities.

Answer; As the sports captain I will form five committees. These are as follows…

Publicity Committee: -This committee will prepare the advertisement plans, announce the sports events' dates, venues and notify the same to public through newspaper, television, e-mail and websites.

Boarding and Lodging Committee: -This committee will arrange the accommodation of the participants and ensure the provisions for food and refreshment.

Transportation Committee: - This committee provides the necessary transportation to the participants to and from the venue.

Grounds and Equipment Committee: - This committee takes care of the ground where the event is to take place. At the same time, it also takes care of the equipment and check if they are running properly.

Reception Committee: - The members of this committee have the responsibility to welcome the Chief Guest and spectators at opening and closing ceremonies.

2) What do you understand by intramural? What is its importance?

The word intramural is derived from the Latin words intra and muros, which means 'within walls'. The teams Compete within the walls of an institution e.g. inter-class tournament or inter-house tournament in a school.

Importance of Intramurals

- It improves the sense of citizenship and responsible living .
- It helps in selection of teams for participation in extramural competitions.
- It brings out the hidden talents of the students.
- It develops leadership qualities in students.
- It creates recreational atmosphere among the teachers and students.
- It helps the students to learn about the conduct of various games.
- It develops the physical fitness of students. &It develops social values and qualities.
- It develops personality.It provides relaxation from strenuous school work.

3) What do you mean by tournament? Draw a fixture of 13 teams in knock-out tournaments.

Answer: Fixture is the process of arranging the teams in systematic order in various groups for competition in a physical activity. In other words, it is the set-up of various teams for competitive matches where they play in a systematic order as per the fixture schedule. A tournament is a competition held among various teams in a particular activity according to a fixed schedule where a winner is decided.

Fixture of 13 teams

Total teams =13

Total matches = N – 1 = 13 – 1 = 12 matches

Number of teams in upper half =N+1/2=13+1/2=14/2=7 terms

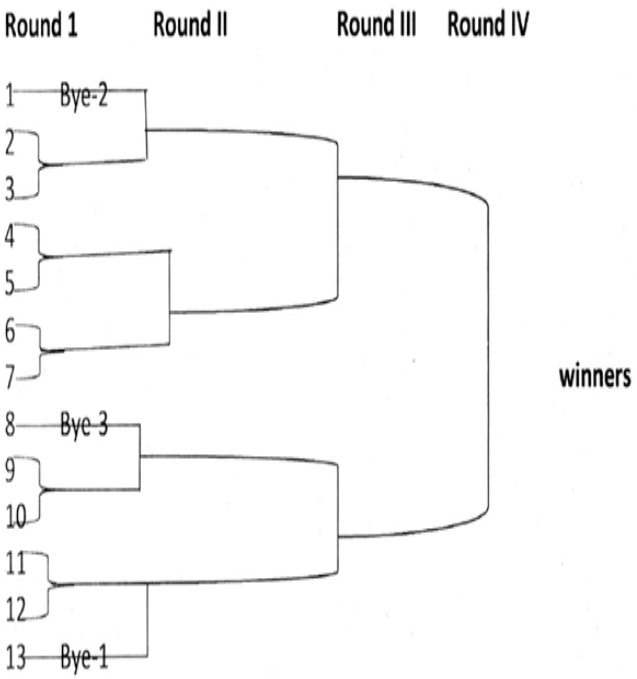
Number of teams in lower half =N−1/2=13−1/2=12/2=6 teams

Total number of byes = Next power of two – total teams = 16-13= 3 byes

Number of byes in upper half = Total number of byes

−12=3−1/2=2/2=1 bye

Number of byes in lower half = Total number of byes +12=3+1/2=4/2=2 bye



4) **Explain in detail the various committees formed for the organization of a sports event. Discuss their roles and responsibilities with suitable examples.**

5) **What are the different types of tournaments conducted in sports? Compare knock-out, league, and combination tournaments with advantages and disadvantages of each.**

UNIT-2

CHILDREN &WOMEN IN SPORTS

CONTENT:

- Exercise guidelines of WHO for different age groups.
- Common postural deformities-knock knees, flat foot, round shoulders, Lordosis, Kyphosis, Scoliosis, and bow legs and their respective corrective measures.
- Women's participation in Sports – Physical, Psychological, and social benefits.
- Special consideration (menarche and menstrual dysfunction).
- Female athlete triad (Osteoporosis, Amenorrhea, eating disorders)

LEARNING OBJECTIVES

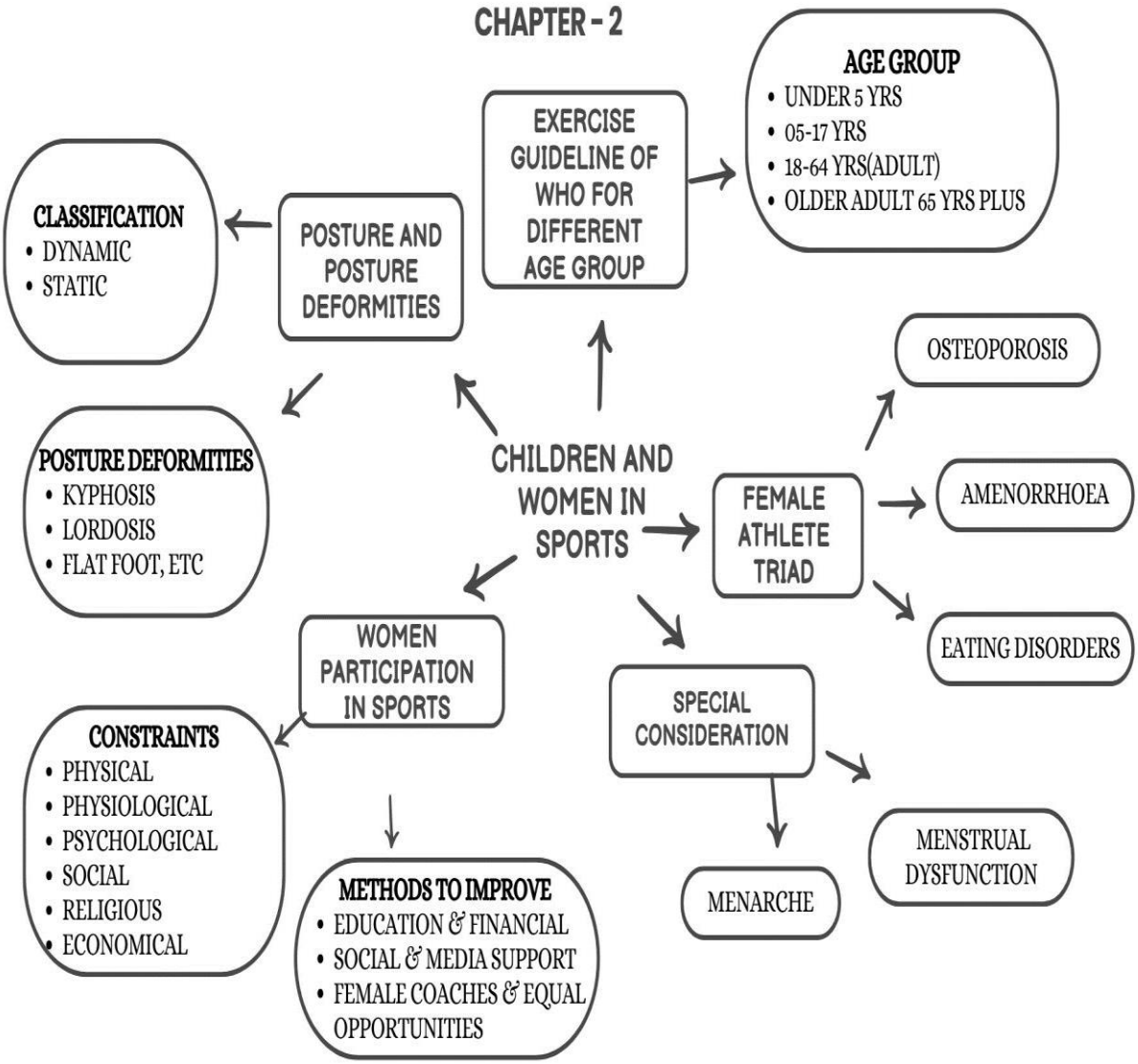
- To make students understand the exercise guidelines of WHO for different age groups
- To make students aware of the common postural deformities
- To make students aware of women's sports participation in India and about the special conditions of women
- To make students understand menarche and menstrual dysfunction among women athletes
- To make them understand about female athlete triad

LEARNING OUTCOMES

- Differentiate exercise guidelines for different stages of growth and development.
- Classify common postural deformities and identify corrective measures.
- Recognize the role and importance of women's sports participation in India.
- Identify special considerations related to menarche and menstrual dysfunction.
- Express the female athlete triad according to eating disorders.

MIND MAP

(MARKS WEIGHTAGE-O7 MARKS)



2.1.1 EXERCISE GUIDELINES OF WHO FOR DIFFERENT AGE GROUPS

- The World Health Organisation (WHO) lists physical inactivity as the fourth leading cause of global deaths (6%).
- Regular physical activity supports physical, mental, and social well-being.
- Participation in sports boosts self-confidence and emotional control.
- It helps reduce stress, anxiety, and depression.
- Physical activity also supports healthy weight maintenance.
- It promotes better social interaction and academic performance.
- All age groups benefit from physical activity: infants, children, adolescents, and adults.
- Children should avoid long hours of inactivity, like watching TV or playing video games.
- WHO's Global Recommendations provide guidelines on the right amount and type of physical activity to prevent lifestyle diseases.

Infants (0–1 year)

- Should be active several times a day. Let them crawl, roll, reach, and play on the floor (tummy time).
- No screen time. Encourage storytelling when resting.
- Sleep: 14–17 hours (0–3 months), 12–16 hours (4–11 months).

Toddlers (1–2 years)

- At least 3 hours of physical activity spread across the day.
- No more than 1 hour of screen time for 2-year-olds.
- Sleep: 11–14 hours with naps and regular sleep time.

Preschoolers/ pre-primary children (3–4 years)

- 3 hours of varied activity; at least 1 hour should be energetic (like running or jumping).
- Limit screen time to less than 1 hour.
- Sleep: 10–13 hours with naps.

Children & Teens (5–17 years)

- At least 1 hour of moderate to vigorous activity daily.

- Activities should include running, jumping, throwing, and team sports.
- It helps with fitness, stronger bones, and better mental health.

Adults (18–64 years)

- 150–300 minutes of moderate activity or 75–150 minutes of intense activity per week.
- Include muscle-strengthening activities twice a week.
- Helps in managing weight and reducing disease risk.

Seniors (65+ years)

- Same as adults, but add balance exercises (e.g., standing on one leg).
- Helps prevent falls, keeps bones strong, and maintains health.
- Consult a doctor if there are health issues.

INFANTS (0–1 YEAR)

Age	Sedentary Behaviour	Physical Activity	Sleep
Less than 1 year	Not to be restrained for more than 1 hour at a time. Encourage reading and storytelling when sedentary. Screen time is not recommended.	Physically active several times a day through interactive floor-based play including 30 minutes of tummy time.	14–17 hours (0–3 months of age), 12–16 hours (4–11 months of age) of good quality sleep, including naps.
1–2 years	Not to be restrained for more than 1 hour at a time or sit for extended periods of time. No screen time for 1-year-olds. For 2 years, sedentary screen time should be no more than 1 hour. Encourage reading and storytelling.	At least 180 minutes in a variety of types of physical activities including moderate- to vigorous-intensity physical activity, spread throughout the day.	11–14 hours of good quality sleep, including naps, with regular sleep and wake-up times.

3–4 years	Not to be restrained for more than 1 hour at a time or sit for extended periods of time. Sedentary screen time should be no more than 1 hour; less is better. Encourage reading and storytelling.	At least 180 minutes in different types of physical activities at any intensity, of which at least 60 minutes is moderate- to vigorous-intensity physical activity, spread throughout the day.	10–13 hours of good quality sleep, which may include a nap, with regular sleep and wake-up times.

2.1.2 CHILDREN AND YOUTH OF 05 TO 17 YEARS

Parameter	Details
Intensity	Moderate to Vigorous.
Volume/Duration	At least one hour in a day; more than 60 minutes will provide additional health benefits.
Frequency	One session of 1 hour or two sessions of 30 minutes each.
Types of Activities	Aerobic, basic exercises for strengthening of muscles, Fundamental activities (Jumping, running, throwing, turning, twisting, etc.)
Benefits	Regular exercise helps to develop the musculo-skeletal system (bones, muscles, and joints), cardiovascular system (heart and lungs), neuromuscular system (coordination, movement control, motor learning), and maintain healthy body composition. Physical activities also help to develop psychological (control over emotions, anxiety, depression, and stress) and sociological aspects (interaction, integration, leadership), result in healthy behaviour (avoidance of tobacco, alcohol, drugs), and promote academic performance.
Activities	Play, games, sports, recreation, physical education, unplanned to planned exercises with or within family, school, and community.

2.1.3ADULTS OF 18 TO 64 YEARS

Parameter	Details
Intensity	Moderate to Vigorous.
Types of Activities	Muscular strengthening (strength) and Aerobic physical activities
Aerobic Activities	150 to 300 minutes per week with moderate intensity or 75 to 150 minutes per week with vigorous intensity; one aerobic activity bout should be at least 10 minutes
Muscle Strengthening Activities	Activities involving major muscles two or more days in a week
Benefits	Regular physical activity helps to lower the risk of all causes of mortality (e.g., heart diseases, blood pressure, stroke, Type 2 diabetes, metabolic syndrome, colon and breast cancers, and depression), hip or vertebral fractures. It helps develop higher cardiorespiratory and muscular fitness, maintain a healthy weight and body composition, improve bone health, and reduce the risk of Non-Communicable Diseases and depression.
Activities	Physical activities (walking, jogging, swimming, weight training, dancing, etc.), occupational work, household work (car wash, gardening, etc.), games, sports,

	recreation, transportation (walking, cycling), and planned exercises with or within family and community.

2.1.4 OLDER ADULTS OF 65 YEARS AND ABOVE

Parameter	Details
Intensity	Moderate to Vigorous.
Types of Activities	Muscular strengthening (strength) and Aerobic physical activities and Balance-enhancing exercises.
Aerobic Activities	150 to 300 minutes per week with moderate intensity or 75 to 150 minutes per week with vigorous intensity; one aerobic activity bout should be at least 10 minutes.
Muscle Strengthening Activities	Activities involving major muscles involved activity, two or more days in a week.
Balance-enhancing Activities	Older adults, with poor mobility, should perform physical activity to enhance balance and prevent falls on 3 or more days per week.
Benefits	Regular physical activity helps to lower the risk of all causes of mortality (e.g., heart disease, blood pressure, stroke, Type 2 diabetes, metabolic syndrome, colon and breast cancers, and depression), hip or vertebral fractures. It improves cardiorespiratory and muscular fitness, helps maintain a healthy weight and body composition, and lowers the risk of Non-Communicable Diseases, depression, and cognitive decline.
Activities	Physical activities (walking, jogging, swimming, weight training, dancing, etc.), occupational work, household work (car wash, gardening, etc.), games, sports, recreation, transportation (walking, cycling), and planned exercises with or within family and community.

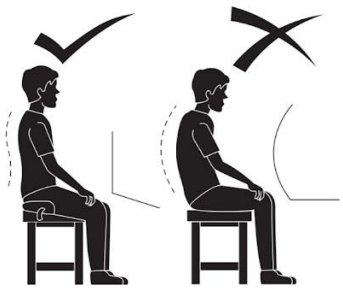
2. 2 POSTURE:

Posture is defined as the attitude assumed by the body either with support during the course of muscular activity, or as a result of the coordinated action performed by a group of muscles working to maintain stability.

Posture is classified into two categories.

- **Dynamic posture** refers to body alignment while moving (e.g., walking or bending), requiring muscles to adapt to motion.

- **Static posture** is body alignment while still (e.g., sitting or standing), maintained by muscle coordination to resist gravity.

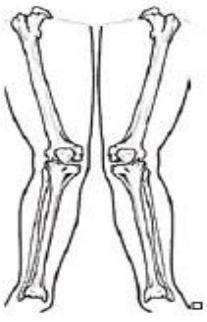


Maintaining good posture ensures proper body alignment, reducing stress on joints and muscles, preventing fatigue, and promoting better productivity and well-being. Postural deformities can result from heredity, illness, injury, poor habits, lifestyle factors, or lack of exercise.

2.2.1 COMMON POSTURAL PROBLEMS IN CHILDREN

- Common postural deformities include knock knees, flat feet, bow legs, round shoulders, scoliosis, lordosis, and kyphosis. These can affect body alignment and movement. Corrective exercises, posture training, and medical support can help manage them. Such measures should always be done under the supervision of a doctor or physiotherapist.

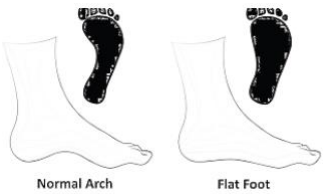
2.1.2 Knock Knees



Knocked knees, medically known as **genu valgum**, is a condition where a person's knees touch or angle inward while the ankles remain apart when standing straight. This causes the legs to form an "X" shape and can affect posture, balance, and walking pattern.

- Causes: Weak bones, obesity, or lack of vitamins.
- Fix: Leg exercises, horse riding, yoga, and reducing weight.

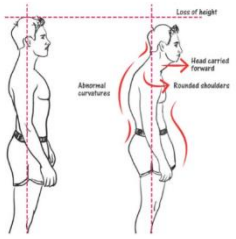
2.2.3 Flat Foot



- Feet have no arch; full sole touches the ground.
  - Causes: Poor footwear, weak muscles, or obesity.

- Fix: Toe exercises, walking on toes, yoga, and massages.

2.2.4 Round Shoulders



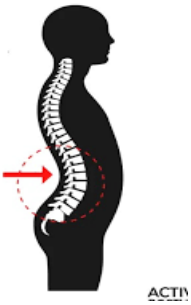
- Shoulders bend forward.
  - Causes: Poor posture, long computer use, weak muscles.
  - Fix: Stretching, yoga (ChakrasanA), and back exercises

.

2.2.5 Kyphosis (Hunch Back)

- The upper back curves outward too much.
  - Causes: Poor posture, weak bones, or heavy school bags.
  - Fix: Back-strengthening exercises and yoga (BhujangasanA).

2.2.6 Lordosis (Sway Back)



- **Lordosis** is a condition in which there is an **excessive inward curvature of the spine**, usually in the **lower back (lumbar region)**.
- Causes: Obesity, poor posture, or weak muscles.
  - Fix: Pelvic exercises, wall pushbacks, and yoga.

2.2.7 Scoliosis

- Spine bends sideways in a 'C' or 'S' shape.
  - Causes: Poor posture or unknown reasons.
  - Fix: Side-stretching, hanging from bars, and yoga (TrikonasanA).

2.2.8 Bow Legs

- Legs curve outward at the knees.
  - Common in toddlers and may correct on its own.
  - Fix: Braces, proper shoes, and a healthy diet.

2.3 Women in Sports

In the past, women had fewer chances to play sports. But today, more women are joining and doing well in sports. Famous Indian women athletes include PV Sindhu, Mary Kom, and Hima Das. Playing sports helps women stay fit, gain confidence, and break social barriers.

2.3.1 Women's Participation in Sports

I. **Physical Benefits**

- Reduces Lifestyle Diseases: Lowers risk of diabetes, obesity, and high blood pressure.
- Increases Bone Density: Prevents osteoporosis, especially common in women.
- Tones Muscles: Enhances strength and muscle tone.
- Improves Cardiovascular Health: Boosts oxygen intake and stamina.
- Controls Obesity: Helps maintain a healthy body weight.

II. **Psychological Benefits**

- Stress Management: Exercise releases hormones that reduce stress.
- Emotional Control: Builds resilience through challenging sports situations.
- Confidence: Small wins build confidence and self-belief.
- Self-Esteem: Enhances self-worth and positive self-image.
- Leadership Skills: Encourages decision-making and responsibility.

III. **Social Benefits**

- Coordination: Promotes teamwork and collective effort.
- Communication: Improves expression and interaction.
- Relationships: Fosters respectful inter-personal relationships.
- Cooperation: Teaches working in harmony with others.

Ways of Encouraging Women in Sports

- Promote sports from school to university level.
- Organize awareness programs and ensure family support.
- Increase media coverage and sponsorship.
- Develop women-specific sports facilities and gear.
- Appoint women coaches and offer competition opportunities.
- Eliminate cultural barriers and offer state incentives.

Achievements of Indian Women in Sports

- Karnam Malleswari: First Olympic medal (2000).
- Mary Kom, Saina Nehwal, Sakshi Malik, P.V. Sindhu: Olympic and world-level medalists.
- P.T. Usha, Anju Bobby George: Athletics icons.
- Mirabai Chanu, Lovlina Borgohain: Medalists in weightlifting and boxing.
- Saina Nehwal: Former world no. 1 in badminton.
- Indian women's cricket, wrestling, boxing, and badminton teams are achieving international success.

Global and National Support

- IOC: 49% participation of women in the next Olympic Games; supports seminars for women in sports roles.
- Indian Constitution: Ensures gender equality and prohibits gender bias.
- Sports as Empowerment: A powerful tool for gender equity and societal change.

Challenges/Constraints Faced by Women in Sports

- **Physical**: Body structure, less muscle strength, or posture problems.
- **Physiological**: Hormone issues, lower hemoglobin, menstrual problems.
- **Psychological**: Low confidence, fear, or stress.
- **Social**: Lack of family support, strict culture, or religion.
- **Economic:** Less money, fewer facilities, and no sponsors.

But many women overcome these barriers with support, training, and a strong will.

2.4 SPECIAL CONSIDERATION (MENARCHE AND MENSTRUAL DISFUNCTION)

2.4.1 Menarche

Menarche is a girl's first period, usually between the ages of 8 to 15. Menstrual problems can include heavy bleeding, pain, irregular cycles, or no periods.

Common issues: Premenstrual Syndrome (PMS), Amenorrhea (no perioD), and Dysmenorrhea (painful perioD).

Causes: Stress, poor diet, intense exercise, or sudden weight change.

Fix: Proper nutrition, regular exercise, and medical help if needed.

2.4.2 Menstrual Dysfunction

There are several types of menstrual disorders:

1. **Pre-menstrual Syndrome (PMS):** Causes symptoms like depression, anxiety, headache, and fatigue before periods. It can be managed with exercise, a balanced diet, and proper rest.

2. **Amenorrhea:** Absence of menstruation.

    - Primary: Periods never start at puberty.

- Secondary: Periods stop for 3+ months.

3. **Dysmenorrhea:** Painful periods with cramps, back pain, nausea, and fatigue.
4. **Menorrhagia:** Heavy or prolonged menstrual bleeding.
5. **Polymenorrhea:** Frequent periods occurring less than 21 days apart.
6. **Oligomenorrhea:** Infrequent periods occurring more than 35 days apart.
7. **Metrorrhagia:** Irregular or abnormal bleeding between periods.
8. **Postmenopausal Bleeding:** Bleeding after a year of menopause.

Low levels of oestrogen and progesterone due to intense exercise or being underweight, can disrupt normal menstrual cycles.

2.5 FEMALE ATHLETE TRIAD

The Female Athlete Triad is a serious health condition that affects some girls and women involved in intense sports or physical activities, especially when they do not eat enough to support their energy needs.

- Participation in sports and physical activities offers numerous benefits, especially for girls, including improved physical health, mental well-being, leadership, and teamwork skills. It helps regulate weight, reduces the risk of conditions like diabetes and high blood pressure, and supports emotional balance.

- However, when athletic training and competition cross a certain limit, especially in sports that emphasize leanness or weight categories, like gymnastics, distance running, judo, or wrestling, it can lead to serious health concerns.

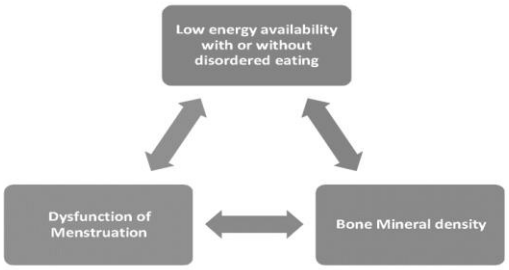
- The pressure to maintain low body weight and high performance may push female athletes toward unhealthy behaviours such as restrictive eating and overtraining.

- This increases the risk of developing the **Female Athlete Triad**, a serious condition involving:
  (A) Disordered eating
  (B) Amenorrhoea (absence of menstruation)
  (C) Osteoporosis (low bone density)

- The triad can have long-term consequences on reproductive and bone health, making awareness, early detection, and proper guidance essential for female athletes.

- The terminology for the Female Athlete Triad has been updated to better reflect the issues involved:
  (A) Low energy availability (with or without an eating disorder)
  (B) Menstrual dysfunction
  (C) Low bone density

- These components are closely linked and can often be corrected by restoring proper energy balance. Ensuring that the body receives enough calories to support both physical activity and basic functions helps maintain menstrual health and bone strength. Addressing these factors early is key to preventing long-term health issues in female athletes.



Female Athlete Triad results from an imbalance between energy intake and expenditure, leading to three interrelated conditions:

1. **Low Energy Availability (with or without Disordered Eating):**
   Athletes may develop eating behaviour disorders, from calorie restriction to clinical conditions like anorexia nervosa and bulimia nervosa. These are more common in sports that emphasize leanness. Symptoms include menstrual dysfunction, fatigue, weight loss, digestive issues, and mental health challenges. Coaches, parents, and staff must recognize signs early to prevent long-term or fatal effects.

2. **Menstrual Dysfunction:**
   Irregular or missed periods are common in female athletes and often ignored. If unmanaged, they can impair bone health and athletic performance. Early education and management are essential to avoid long-term complications. Over 15% of Olympic female athletes may experience amenorrhea, which negatively impacts skeletal health.

3. **Low Bone Mineral Density (BMD):**
   Caused by hormonal imbalance and poor nutrition, low BMD increases the risk of fractures and early osteoporosis. Bone mass peaks in the 20s–30s and is influenced by genetics, nutrition, and physical activity. Monitoring training intensity and considering genetic factors can help reduce risk.

Treatment & Management:
The key to recovery is restoring energy balance, which includes proper nutrition, weight gain, and menstrual regularity. Cognitive behavioural therapy and family-based support

are effective for treating disordered eating. Sports nutritionists play a crucial role in planning balanced diets and supplements to restore bone health and overall well-being.

HOW TO PREVENT AND TREAT

- ✓ Eat a balanced diet rich in calcium, vitamin D, and protein.
- ✓ Avoid extreme dieting or overtraining.
- ✓ Seek help from a doctor if periods stop or bones ache.
- ✓ Parents and coaches must provide support and watch for signs.

1 MARK QUESTIONS MCQ (SolveD)

1. Scoliosis is a postural deformity related to _____

   A. Muscles B. Shoulder C. Legs D. Spine

   Answer: D

2. Which domain involves emotional growth?

   A. Physical B. Affective C. Cognitive D. Psychomotor

   Answer: B

3. Sakshi Malik won a medal in

   A. Badminton B. Chess C. Wrestling D. Weightlifting

   Answer: C

4. How much physical activity is recommended daily for a 10-year-old child?

   A. 20 minutes B. 30 minutes C. 60 minutes D. 90 minutes

   Answer: C

5. Which is the type of exercise recommended for adults of 18–64 years?

   A. Only yoga B. Light walking

   C. 150–300 mins of moderate activity D. No need for activity

   Answer: C

6. The transition period between childhood to adulthood is called

   A. Senescence B. Adolescence C. Early childhood D. Infant hood

   Answer: B

7. What is one common cause of knock knees?

A. Not enough calcium B. Being overweight

C. Sitting for a long time D. None of these

Answer: B. Being overweight

8. Which exercise helps correct flat foot?

   A. Swimming B. Walking on toes C. Heel raise D. Sit-ups

Answer: C

9. Who is the Indian woman who won a gold medal in World Badminton Championship?

A. Mary Kom B. Saina Nehwal C. P.V. Sindhu D. Sania Mirza

Answer: B

10. What is one big reason that stops many women from playing sports?

A. Being too tall B. Low red blood cells

C. Having high stamina D. Eating healthy food

Answer: A. Being too

11. What is menarche?

A. First period B. Last period C. Monthly pain D. Exercise routine

Answer: A

12. Amenorrhea means:

A. Heavy bleeding B. No periods C. Shorter cycle D. Painful periods

Answer: C

13. Which is NOT a part of the Female Athlete Triad?

A. Low energy B. Eating disorder C. Strong bones D. Amenorrhea

Answer: C

14. Osteoporosis is related to:

A. High blood pressure B. Decay in bones density C. Weight gain D. Heart issues

Answer: B

15. The Female Athlete Triad is a syndrome characterized by

A. Osteoporosis B. Amenorrhea C. Eating Disorder D. All of the above

Answer: D

MCQ (UnsolveD)

1. Ball handling is an activity that starts in a child in the developmental stage called

A. Infancy B. Early childhood

C. Middle childhood D. Late childhood

2. .....is a postural deformity in which both knees touch or overlap each other in the normal standing position.

A. Kyphosis B. Lordosis C. Flat foot D. Knock knees

3. In which Olympics did women participate for the first time?

A. 1896 B. 1900 C. 1904 D. 1908

4. Which one of the following exercises will be most appropriate for a 11-year-old child?

A. Twisting B. Cycling C. Pulling D. Playing with high-intensity outdoor games

5. P V Sindu was the first Indian to win world championship. She won ------ medal.

A. 2013 Bronze B. 2016 Silver C. 2014 Bronze D. 2019 Gold

2 MARKS QUESTIONS -VERY SHORT QUESTIONS

1. What is meant by the Female Athlete Triad?
Ans: The Female Athlete Triad is a medical condition seen in physically active females involving three interrelated components: low energy availability (with or without disorderly eating), menstrual dysfunction (amenorrhea), and low bone mineral density (osteoporosis).

2. What is amenorrhea and how does it affect female athletes?
Ans: Amenorrhea is the absence of menstruation. In female athletes, it can result from low energy availability and may lead to hormonal imbalance and reduced bone density.

3. Mention any two benefits of regular physical activity in children.
Ans: Regular physical activity helps in building strong bones and muscles, and improves coordination and overall fitness.

4. What are knock knees? Name one corrective measure.
Ans: Knock knees (Genu valgum) is a condition where the knees touch but ankles stay apart while standing. Corrective exercise like side-leg raises or supervised physical therapy can help.

5. Define static posture with one example.
Ans: Static posture refers to the body's position while being still, such as sitting or standing. For example, standing upright with aligned spine and shoulders.

6. Mention two causes of postural deformities.
Ans: Poor sitting habits and lack of physical activity are two common causes of postural deformities.

7. How does physical activity help in preventing lifestyle diseases?
Ans: It regulates body weight, improves metabolism, and lowers the risk of diseases like diabetes, obesity, and hypertension.

8. What are eating disorders? Give an example.
Ans: Eating disorders include unhealthy eating behaviours aimed at weight control. An example is skipping meals or extreme calorie restriction.

9. Name two psychological benefits of participation in sports.
Ans: Sports boost self-esteem and help in managing stress and anxiety.

10. Name any two types of constraints faced by women in sports.

Ans: 1. Physical

2. Physiological

UNSOLVED VERY SHORT ANSWER QUESTIONS (2 MARKS EACH)

1. What is low bone mineral density, and how does it affect the body?
2. Explain the term dynamic posture with an example.
3. List any two causes of amenorrhea in female athletes.
4. Mention two postural deformities and the body parts they affect.
5. Write two ways to manage or prevent the Female Athlete Triad

SHORT ANSWER TYPE QUESTIONS (3 Marks)

1. Explain the three components of the Female Athlete Triad.

Ans:

The Female Athlete Triad is a serious health condition commonly found in physically active females.

A) Low Energy Availability: Occurs when energy intake is insufficient to meet the demands of physical activity and basic bodily functions, often due to excessive training or disordered eating.

B) Menstrual Dysfunction: Refers to irregular or absent menstrual cycles (amenorrhea), caused by hormonal imbalances resulting from low energy.

C) Low Bone Mineral Density: Reduced bone strength due to hormonal changes, especially low oestrogen levels, which increases the risk of fractures and long-term bone issues like osteoporosis.

2. Mention any three benefits of regular participation in physical activities for children.

Ans:

A) Physical Fitness: Regular physical activity helps in building strong muscles and bones, enhancing stamina, and improving cardiovascular health.

B) Mental and Emotional Well-being: It reduces stress, anxiety, and depression while boosting mood and self-esteem.

C) Social Development**:** Participating in group sports promotes teamwork, leadership skills, discipline, and cooperation among peers.

3. Describe any three common postural deformities.

Ans:

A) Kyphosis: This is an excessive outward curve of the upper spine, leading to a hunched back. It can be caused by poor posture, weak muscles, or spinal issues.

B) Lordosis: It is the exaggerated inward curvature of the lower back, often resulting from weak abdominal muscles or obesity.

C) Flat Foot**:** In this condition, the arches of the feet collapse, causing the entire sole to touch the ground. It can lead to pain and poor balance.

4. How does poor posture affect the body? Give three effects.

Ans:

A) Muscular and Joint Strain: Poor posture puts undue pressure on muscles and joints,

leading to fatigue and discomfort.
B) Reduced Physical Efficiency: It hampers movement patterns, reducing an individual's ability to perform physical tasks efficiently.
C) Chronic Pain and Deformities**:** Over time, incorrect posture may result in spinal deformities, back pain, neck stiffness, and joint misalignment.

5. Explain any three causes of menstrual dysfunction in female athletes.
Ans:
A) Low Energy Intake: Female athletes who do not consume enough calories to match their physical activity often experience hormonal disruption.
B) Excessive Training Load: Intense physical training without adequate rest can lead to suppressed reproductive function and delayed or missed periods.
C) Psychological Stress and Pressure**:** Competitive stress, body image concerns, and performance anxiety can all interfere with the menstrual cycle.

6. What are three ways to prevent or manage the Female Athlete Triad?
Ans:
A) Balanced Nutrition: Ensuring the athlete consumes enough calories to meet both energy demands and bodily functions is key to preventing the triad.
B) Medical and Psychological Support: Early diagnosis, counselling, and proper treatment can help restore menstrual health and bone density.
C) Awareness and Education**:** Educating athletes, coaches, and parents about the risks of overtraining and disordered eating encourages early prevention and support.

3 Unsolved Short Answer Questions (3 Marks Each)

1. What are the effects of physical inactivity on children's physical and mental health?

2. Describe three corrective measures for any one postural deformities.

3. Explain the term 'low energy availability' and how it impacts athletic performance.

4 MARKS - CASE-BASED QUESTIONS

Case Study 1

Anita, a 17-year-old long-distance runner, has been training intensively for national competitions. Despite her dedication, she hasn't had her menstrual cycle for the last four months. Her coach is concerned, as Anita also reports fatigue, low energy, and frequent leg cramps. Upon consulting a sports physician, she is diagnosed with amenorrhea, a component of the Female Athlete Triad.

1. What are the three components of the Female Athlete Triad?

A) Low energy, high metabolism, low BMI
B) **Amenorrhea, osteoporosis, disordered eating**
C) Menstrual cramps, low BMD, and obesity
D) None of the above

2. What is the likely cause of Anita's amenorrhea?

A) High protein intake
B) Poor water consumption
C) **Energy imbalance due to overtraining and low-calorie intake**
D) Excess sleep

3. Which of the following is a long-term risk of ignoring menstrual dysfunction?

A) Stronger muscles
B) Improved vision
C) **Weak bone health and stress fractures**
D) Better flexibility

Case Study 2

Ravi is a 10-year-old boy who spends most of his time watching TV and playing video games. His parents are worried about his increasing weight and poor posture. His school recently started a physical education program encouraging students to engage in outdoor activities like yoga, football, and dance.

Questions (MCQ):
1. Which of the following is a physical benefit of regular exercise in children?
A) Weaker bones
B) Poor concentration
C) **Healthy weight and stronger muscles**
D) Reduced height

2. Which of the following affects motor development in children?
A) Climate
B) **Nutrition and physical activity**
C) Internet usage
D) Language

3. What is one way to help Ravi improve his posture?
A) Watching more TV B) Sleeping late C) **Doing physical activities regularly** D) Avoiding sunlight

Case Study 3

Priya, a 13-year-old girl, often complains of back pain and is observed walking with slouched shoulders. Her physical education teacher suspects she may have developed a postural deformity due to poor sitting habits and lack of physical activity. A physiotherapist confirms that she has *round shoulders*.

1. Which of the following is NOT a postural deformity?
A) Flat feet
B) Knock knees
C) **Strong posture**
D) Scoliosis

2. One cause of postural deformities is:
A) Eating fruits

B) **Poor sitting habits**
C) Good sleep
D) Playing outdoor games

3. Which corrective measure is suitable for Priya?
A) Carrying heavy bags
B) Ignoring posture
C) **Doing strengthening and stretching exercises**
D) Sitting for long hours

Case Study 4

Seema is a talented boxer preparing for a state-level championship. While she performs well, she feels immense pressure to stay within a specific weight category. As a result, she has started skipping meals and overexercising. Her performance is declining, and she experiences mood swings and irregular periods.

1. Seema's symptoms suggest she may be suffering from:

A) Anaemia B) Female Athlete Triad

C) Thyroid D) Hypertension

Answer: B. Female Athlete Triad

2. Main reason behind Seema's health issues is:

A) Lack of training B) Energy imbalance from restrictive eating

C) Too much rest D) High protein diet

Answer: B. Energy imbalance from restrictive eating

3. Best action Seema's coach should take is:

A) Ignore the signs B) Encourage more fasting

C) Refer her to a sports nutritionist or psychologist D) Increase training hours

Answer: C. Refer her to a sports nutritionist or psychologist

4. Most likely long-term risk if Seema continues this pattern is:

A) Better stamina B) Stronger immunity

C) Bone loss and hormonal issues D) Improved muscle gain

Answer: C. Bone loss and hormonal issues

Case Study 5 *(UNSOLVED)*

1. One psychological benefit of sports for girls is:

A) Lower grades B) Increased anxiety

C) Boosted self-confidence D) Reduced communication

2. Physical activity helps reduce lifestyle diseases by:

A) Promoting poor eating B) Weakening immunity

C) Regulating body weight and metabolism D) Reducing sleep quality

3. Importance of promoting sports among girls in schools is:

A) To increase screen time B) To limit physical movement

C) To build life skills and improve health D) To reduce outdoor play

4. One physical benefit Meena is likely to experience from this program is:

A) Poor posture B) Improved fitness and strength

C) Increased laziness D) Low energy

Case Study 6 *(UNSOLVED)*

Nisha is 16-year-old gymnast training six days a week. She has recently been trying to lose weight to improve her performance and appearance. She often skips meals and avoids carbohydrates. Over time, she begins to feel tired, loses focus in school, and stops getting her monthly periods. Her coach notices her weakness during practice and advises a medical consultation.

1. What condition is Nisha likely to develop due to her behaviour?
A) Obesity
B) Female Athlete Triad
C) High blood pressure
D) Diabetes

2. Which of the following is a symptom of low energy availability?
A) Increased muscle strength
B) Normal menstrual cycle
C) Fatigue and missed periods
D) Better focus in academics

3. What is an appropriate first step to help Nisha recover?
A) Reduce her water intake
B) Increase training sessions
C) Restore proper eating habits and seek medical help
D) Encourage further weight loss

5 MARKS QUESTIONS - LONG ANSWER TYPE QUESTIONS

1. Explain the Female Athlete Triad in detail. Discuss its components, causes, and preventive measures.

The Female Athlete Triad is a serious health concern affecting physically active girls and women. It involves three interrelated conditions:

Low Energy Availability:
This occurs when energy intake through food is insufficient to meet the energy demands of

both training and normal bodily functions. It may result from disordered eating or unintentional undereating due to intense training schedules.

Menstrual Dysfunction:
Low energy availability disrupts hormonal function, especially estrogenic production, leading to menstrual irregularities like amenorrhea (absence of periods). This is a sign of hormonal imbalance and a marker of reproductive health concerns.

Low Bone Mineral Density (BMD):
Reduced estrogenic levels also impair calcium absorption and bone formation, resulting in weak bones and higher risk of fractures and osteoporosis, even at a young age.

Causes:

- Excessive training without proper nutrition
- Pressure to stay thin or maintain a specific weight
- Lack of awareness about nutrition and menstrual health
- Emotional stress and competitive anxiety

Preventive Measures:

- Ensuring a balanced diet with adequate caloric intake
- Monitoring menstrual health and body weight regularly
- Reducing training load when necessary
- Providing psychological and nutritional counselling
- Educating athletes, coaches, and families about the risks and signs of the triad

2. Describe various types of postural deformities in children. What are their causes and corrective measures?

Postural deformities are structural misalignments in the body's posture that can lead to discomfort, reduced performance, and long-term health issues. Common types include:

Kyphosis:
An excessive outward curve of the upper spine, resulting in a hunchback appearance.
Cause: Poor posture, weak back muscles, spinal abnormalities.
Correction: Back-strengthening exercises and bracing if needed.

Lordosis:
An exaggerated inward curve of the lower back.
Cause: Weak abdominal muscles, obesity, or poor posture.
Correction**:** Core strengthening, stretching the hip flexors.

Scoliosis:
A lateral (sideways) curvature of the spine, often developing during adolescence.

Cause: Idiopathic (unknown) or congenital.
Correction: Bracing, physiotherapy, or surgery in severe cases.

Knock Knees (Genu Valgus):
Knees touch but ankles remain apart while standing.
Cause: Vitamin D deficiency, obesity, poor posture.
Correction: Strengthening leg muscles, corrective footwear, and physiotherapy.

Flat Foot:
The foot's arch collapses, and the sole touches the ground entirely.
Cause: Weak foot muscles, heredity.
Correction: Arch support, barefoot walking on sand, foot exercises.

General Causes:

- Lack of physical activity
- Poor sitting or standing habits
- Nutritional deficiencies
- Carrying heavy school bags improperly

Corrective Measures:

- Early detection and physiotherapy
- Postural training
- Supervised exercise programs
- Adequate nutrition and ergonomic furniture

3. Discuss the importance of physical activity and sports in the overall development of children and adolescents.

Physical activity and sports play a vital role in the **holistic development** of children and adolescents, influencing their physical, mental, social, and emotional well-being.

Physical Benefits:

- Improves cardiovascular fitness, muscular strength, and endurance
- Enhances flexibility and motor coordination
- Prevents childhood obesity and related disorders
- Promotes better sleep and energy levels

Mental and Emotional Benefits:

- Reduces stress, anxiety, and symptoms of depression
- Boosts self-confidence, self-discipline, and emotional resilience
- Encourages goal-setting, focus, and motivation

Social Development:

- Develops teamwork, cooperation, and leadership skills
- Builds friendships and teaches respect for others
- Provides opportunities for inclusion and communication

Academic Performance:
Studies have shown a positive link between physical activity and academic success. Active children tend to have better concentration, memory, and classroom behaviour.

Lifestyle and Habit Formation:

- Encourages the adoption of healthy habits early in life
- Reduces screen time and sedentary behaviour
- Promotes lifelong fitness awareness and responsibility

UNSOLVED LONG ANSWER TYPE QUESTIONS (5 MARKS EACH)

1. **Describe in detail the role of nutrition, training, and rest in preventing menstrual dysfunction among female athletes.**
2. **What are the benefits of women's participation in sports?"**

UNIT – 3

YOGA AS PREVENTIVE MEASURE FOR LIFESTYLE DISEASE

CONTENT:-

- **Obesity:** Steps To Perform The Asana, Benefits & contraindications for Tadasana, Katichakrasana, Pavanmuktasana, Matsayasana, Halasana, Paschimottasana, Ardh Matsyendrasana, Dhanurasana, Ushtrasana, Suryabedhan pranayama.

- **Diabetes:** Steps To Perform The Asana, Benefits & contraindications for Ktichakrasana, Pavanmuktasana, Bhujangasana, Shalabhasana, Dhanurasana, Supta-vajarasana, Paschimottasana, Ardh Matsyendrasana, Mandukasana, Yogmudra, Gomukhasana, Ushtrasana, Kapalbhati

- **Asthma:** Steps To Perform The Asana, Benefits & contraindications for Tadasana, Urdhwahastottasana, Uttan Mandukasana, Bhujangasana, Dhanurasana, Ushtrasana, Vakrasana, Kapalbhati, Gomukhasana, Mtsyaasana, Anulom- Vilom.

- **Hypertension:** Steps To Perform The Asana, Benefits & contraindications for Tadasana, Katichakrasana, Uttanpadasana, Ardha Halasana, Sarla Matyasana, Gomukhasana, Uttan Mandukasana, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi-Shodhanapranayam, Sitlipranayam.

- **Back Pain and Arthritis:** Steps To Perform The Asana, Benefits & Contraindications of Tadasan, Urdhawahastootansana, Ardh-Chakrasana, Ushtrasana, Vakrasana, Sarala Maysyendrsana, Bhujandgasana, Gomukhasana, Bhadrasana, Makarasana, Nadi-Shodhana pranayama.

LEARNING OBJECTIVES

- The child should be able to identify the benefits of the asana for different types of lifestyle diseases and health problems.
- Recognize the importance of various asanas for preventive measures against obesity, diabetes, asthma, hypertension and back pain.
- Understanding the Steps To Perform The Asana which will help the child reap maximum benefits from them.
- Knowledge of contradictions associated with the performing of different asanas is vital.
- Children should inculcate Yogic practices with daily life in order to counter diseases and enjoy a healthy life style.

MARKS WEIGHTAGE – O6 + 1b*

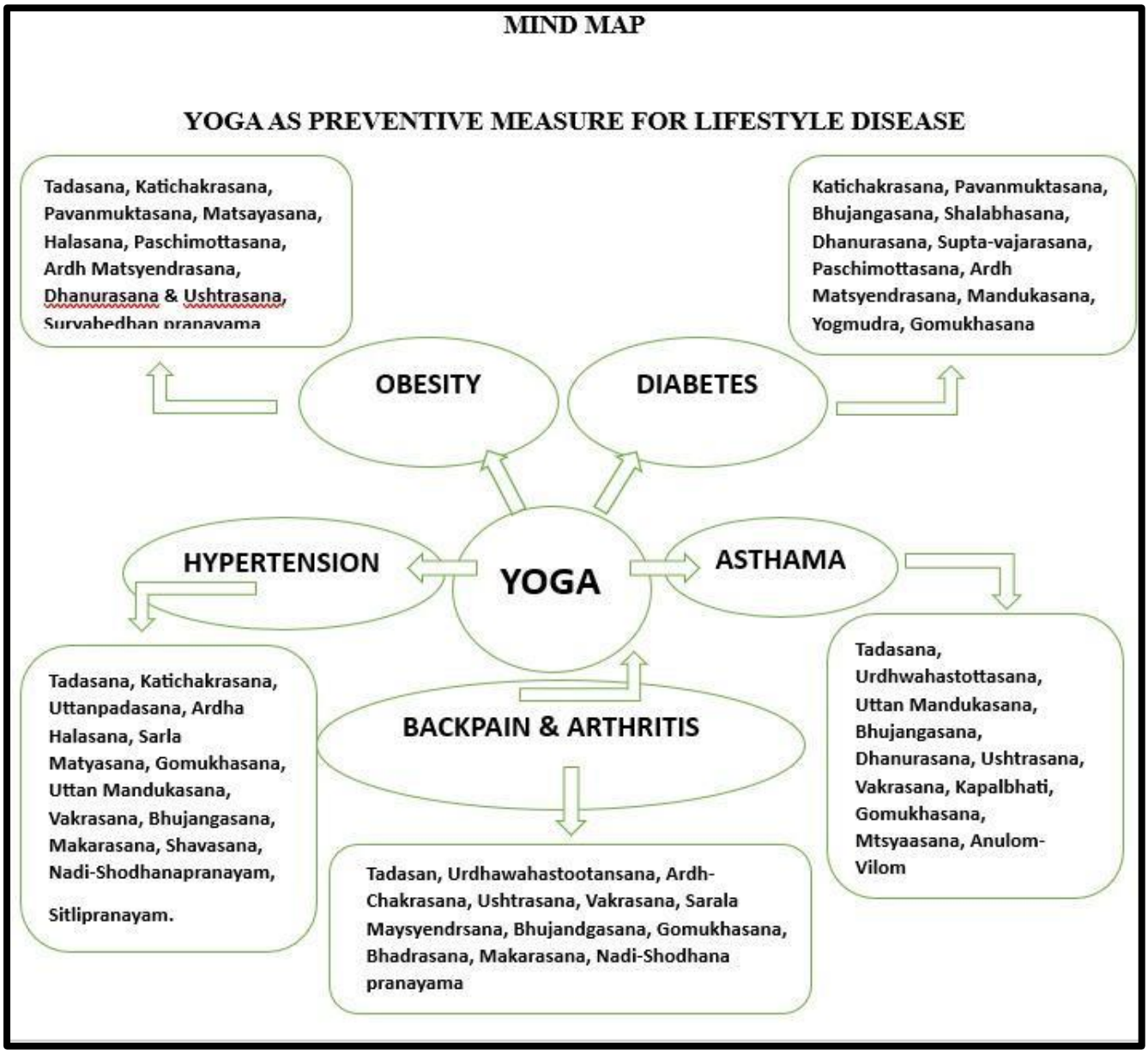


TABLE FOR PREVENTIVE ASANAS & PRANAYAMAS FOR LIFESTYLE DISEASES

SR. NO	NAME OF ASNA/PRANAYAM	OBESITY	DAIBETES	ASTHAMA	HYPERTENSION	BACKPAIN & ARTHERITIS
1	TADASANA	✓		✓	✓	✓
2	KATICHAKRASNA	✓	✓		✓	
3	PAVANMUKTASNA	✓	✓			
4	MATSAYANASANA	✓		✓		
5	HALASANA	✓				
6	PACHIMOTTANASANA	✓	✓			
7	ARDH MATSAYANASANA	✓	✓			
8	DHANURASNA	✓	✓	✓		
9	USHTRASNA	✓	✓	✓		
10	BHUJANGASANA		✓	✓	✓	✓
11	SALABHASANA		✓			
12	SUPTA VAJRASANA		✓			
13	MUNDAKASANA		✓			✓
14	GOMUKHASANA		✓	✓	✓	
15	URDHWAHASTOTASANA			✓		
16	UTTANMANDUKASANA			✓	✓	
17	ARDH HALASANA				✓	
18	SARALA MATSAYANASANA				✓	✓
19	MAKARASANA				✓	✓
20	SAVASANA				✓	
21	ARDHCHAKRASANA					✓
22	BHADRASANA					✓
23	YOGMUDRA					✓
24	SURYBHEDAN	✓				
25	KAPALBHATI		✓	✓		
26	NADISHODHAN				✓	✓
27	SITLI					
28	ANULOMA VILOMA			✓		

OBESITY:

Obesity means weighing more than what is healthy for a given height. Obesity is a serious, chronic disease. It can lead to other health problems

BMI is calculated by dividing the subject's mass by the square of their height

BMI = Weight in KG / Height in Metres ²

OBESITY CATEGORY	BMI (kg/m^2)
Underweight	< 18.5
Normal weight	18.5 – 24.9
Overweight	25.0 – 29.9
Obese (Class I)	30.0 – 34.9
Obese (Class II)	35.0 – 39.9
Obese (Class III)	≥ 40.0

DIABETES:

Diabetes is a chronic disease where the body cannot regulate blood sugar (glucose) levels. This happens because the body doesn't produce enough insulin, or it can't effectively use the insulin it produces. Insulin is a hormone that helps glucose enter cells for energy.

Types of Diabetes:

- Type 1: The body's immune system attacks and destroys insulin-producing cells in the pancreas.
- Type 2: The body becomes resistant to insulin, and the pancreas may not produce enough insulin.
- Gestational Diabetes: Diabetes that develops during pregnancy.

ASTHAMA:

Asthma is a chronic respiratory condition causing inflammation and narrowing of the airways, leading to breathing difficulties. It's characterized by symptoms like wheezing, coughing, shortness of breath, and chest tightness, which can worsen during attacks. Asthma is managed with medications and strategies to avoid triggers and maintain control.

HYPERTENSION:

Hypertension, or high blood pressure, is a condition where the force of blood against the artery walls is consistently too high. It's a major risk factor for heart disease, stroke, and other serious health problems. Hypertension is usually diagnosed when a person's blood pressure readings consistently reach 130/80 mmHg or higher.

BACKPAIN & ARTHRITIS:

Back pain is a common ailment that can range from mild discomfort to severe, debilitating pain

Arthritis, meaning "joint inflammation," is a condition characterized by joint pain, stiffness, and inflammation. It can affect any joint, but commonly impacts hands, knees, hips, feet, shoulders, and the lower back.

TADASANA

This is a traditional posture. The final position of this asana resembles the palm tree. Palm trees are usually erect and straight. Therefore, one should be straight and erect in this asana

STEPS TO PERFORM THE ASANA

Starting Position: Stand with feet together or slightly apart, hands by your thighs

Key Actions:

- Raise arms overhead, interlock fingers, and turn palms up
- Stretch arms, shoulders, and chest upward while inhaling
- Lift heels and balance on toes
- Hold for a few seconds, then lower heels and arms while exhaling

Breathing Guidelines

- Synchronize breathing with movement: inhale while stretching up, exhale while lowering down
- Maintain balance and stability throughout

Essential Tips

- Keep eyes focused on a fixed point to maintain balance
- Lower heels slowly and smoothly to avoid losing balance

Benefits

- Strengthens legs, knees, ankles, arms, and chest
- Stretches hips, groins, hamstrings, calves, shoulders, chest, and spine
- Improves mental and physical balance, digestion, and reduces anxiety and stress

Precautions

- Avoid practicing if you have migraine, diarrhoea, low/high blood pressure, or neck/back

- **AS A PREVENTIVE ASANA AGAINST OBESITY, ASTHAMA, HYPERTENSION & BACKPAIN**

KATICHAKRASANA

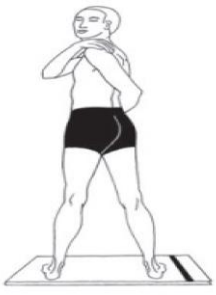
The name of this yoga asana comes from Kati meaning waist and chakra meaning circle. Katichakrasana, literally means rotation of the waist. It gives a nice stretch to the waist and helps in making it more flexible.

STEPS TO PERFORM THE ASANA

Getting into Position

- Stand with legs 2-3 feet apart
- Raise arms to shoulder level, parallel to each other, with palms facing inward

Movement Sequence



- Exhale, twist torso to the left, bringing right palm to left shoulder
- Inhale, return to center
- Exhale, twist torso to the right, bringing left palm to right shoulder
- Inhale, return to center
- Repeat for 2-3 rounds, then relax in Samasthiti

Breathing Pattern

- Inhale: Return to center
- Exhale: Twist to the side

Benefits

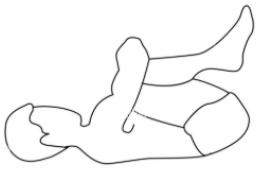
- Relieves constipation
- Strengthens and flexes spine, waist, arms, and legs
- Opens up neck and shoulders
- Tones abdominal muscles and lower back
- Suitable for those with sedentary jobs

Precautions

- Avoid during pregnancy, hernia, slip disc, or recent abdominal surgery
- Consult a doctor if you have chronic spinal disorders
- **AS A PREVENTIVE ASANA AGAINST OBESITY, DIABETES & HYPERTENSION**

PAVANMUKTASANA

The name comes from the Sanskrit word pawan meaning wind and mukta meaning "free". Thus, Pawanmuktasana is also known as the wind removing asana.



STEPS TO PERFORM THE ASANA

- Lie on your back with legs straight
- Bend one knee and bring it towards your abdomen, holding with your hands
- Exhale, lift your head, and try to touch your chin to your knee
- Inhale, straighten your leg, and repeat with the other leg
- Bring both knees towards your abdomen, placing your chin between your knees
- Swing your body back and forth, then left and right, 5-10 times each

Key Points

- Breathe normally throughout the practice
- Focus on coordinating your movements with awareness

Benefits

- - Stretches neck, back, and abdominal muscles
- - Improves digestion, relieves constipation, and reduces bloating
- - Strengthens lower back muscles and loosens spinal vertebrae
- - Beneficial for menstrual health and reproductive organs
- - Helps reduce fat around the abdominal area, thighs, and buttocks

Precautions

- - Avoid if you have had recent abdominal surgery or have hernia, piles, or are pregnant
- - Be gentle and listen to your body, especially if you're new to this asana
- **AS A PREVENTIVE ASANA AGAINST OBESITY & DIABETES**

MATSYASANA

The Sanskrit word Matsya means fish. Hence, Matsyasana refers to the fish pose. According to the ancient Yogic texts, Matsyasana can restore spinal strength and overall body balance, consequently leading to a better physical and emotional outlook.

STEPS TO PERFORM THE ASANA

- Lie in Savasana, stretching arms and legs out
- Place palms under hips, facing down, and bring elbows close to the waist
- Cross legs, keeping thighs and knees flat on the floor

Lifting into the Pose

- - Inhale, lift chest and head, touching crown to the floor
- - Ensure weight is on elbows, not head
- - Hold comfortably, breathing normally

Breathing Technique

- - Inhale, lift chest; exhale, deepen the pose
- - Relax body as you exhale, stretching back down to the floor

Benefits

- - Opens and stretches neck, shoulders, and chest
- - Relieves respiratory disorders, strengthens back muscles
- - Regulates emotions and stress, tones glands

Precautions

- Avoid if you have high/low blood pressure, neck/back injuries, migraine, spondylitis, heart ailments, or are pregnant
- **AS A PREVENTIVE ASANA AGAINST OBESITY & ASTHAMA**

HALASANA

Hala means plough. This posture is known as Halasana because in its final position the shape of the body resembles the Indian plough.

STEPS TO PERFORM THE ASANA

Step-by-Step Instructions

- Lie in supine position, hands by your sides
- Lift legs to 30°, 60°, and 90°, holding each position for a few seconds

- Bring legs towards your head, touching toes to the ground, then stretch legs backward
- Place palms on your head, interlocking fingers, and bring elbows to the ground
- To release, unlock fingers, stretch hands, and lower legs to 90°, then slowly return to starting position

Breathing Technique

- - Control your breath, inhaling deeply as you lift legs to 90°
- - Exhale completely, holding the position for a few breaths

Benefits

- - Relieves digestive issues like dyspepsia and constipation
- - May help with certain types of diabetes
- - Combining with Bhujangasana may enhance benefits

Precautions

- Avoid if you have cervical spondylitis, spinal stiffness, abdominal injuries, or hernia

AS A PREVENTIVE ASANA AGAINST OBESITY

PACHIMOTTANASANA

The word paschimottasana comes from the Sanskrit words paschima meaning west or back of the body and uttana meaning intense stretch or extended. In this asana one has to sit and intensely stretch the back forward.

STEPS TO PERFORM THE ASANA

Step-by-Step Instructions

- Sit with legs straight out in front, hands by your sides
- Loosen back muscles and bend forward, placing hands where comfortable
- Practice daily, gradually increasing flexibility
- Hold big toes with forefingers, forehead on knees
- Release, raising head and returning to starting position

Breathing Technique

- Breathe slowly and deeply in final position
- Exhale if holding for a short duration
- Inhale while returning to starting position

Benefits

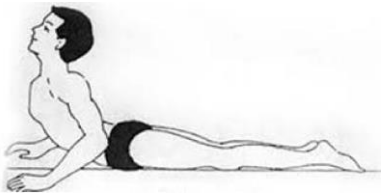
- Stretches back muscles, improves flexibility and alignment
- Tones abdominal and pelvic organs, improves digestion
- Massages and tones internal organs, improves blood circulation

Precautions

- Avoid if you have painful or enlarged liver/spleen, herniated discs, or acute appendicitis
    - **AS A PREVENTIVE ASANA AGAINST OBESITY & DIABETES**

BHUJANGASANA

In Sanskrit the word Bhujanga means Cobra. Since the final position of this asana resembles the 'Hooded Snake' therefore it is called Bhujangasana.



Step-by-Step Instructions

- Lie prone, legs together, hands by shoulders
- Fold hands, place palms on ground, thumbs under armpits
- Raise chin, turn head backward, lift thorax, and spine up to navel
- Hold, then slowly lower body back to ground
- Relax hands and place them by thighs

Breathing Technique

- Inhale while lifting torso
- Breathe normally in final position
- Exhale while lowering torso
- Synchronize breathing and movement

Benefits

- Strengthens and increases flexibility of spine and back muscles
- Opens chest, shoulders, and ribcage
- Stimulates endocrine system and digestive organs
- Good for kyphosis

Precautions

- Avoid during pregnancy, spondylitis, spinal injuries, or weak back muscles

AS A PREVENTIVE ASANA AGAINST DIABETES, ASTHAMA, HYPERTENSION & BACKPAIN

SHALBHASANA

The name Shalabhasana comes from the Sanskrit shalabh which means grasshopper or locust.

Step-by-Step Instructions

- Lie prone, legs together, hands by sides
- Fold hands, bring them under shoulders like Bhujangasana
- Slowly lift legs up, keeping them straight
- Hold, then slowly lower legs down
- Return to starting position

Breathing Technique

- Inhale deeply, retain breath while lifting legs
- Exhale while lowering legs
- Synchronize breathing and movement

Benefits

- - Reduces abdominal fat, tones abdomen
- - Strengthens back and neck muscles
- - Improves digestion, relieves constipation
- - Helps with menstrual problems, strengthens uterus and reproductive system

Precautions

- Avoid if you have acute back pain, slip disc, severe sciatica, or major menstrual problems
- Avoid during pregnancy or if you have blood pressure problems
- **AS A PREVENTIVE ASANA AGAINST OBESITY & DIABETES**

URDHVAHASTOTTANSANA

The name for this asana comes from the Sanskrit urdhva, meaning upward, and hasta, meaning hands. Urdhvahastasana is called upward salute or upward hands pose in English

Step-by-Step Instructions

- Stand upright with fingers interlocked
- Inhale, stretch hands up, keeping feet flat
- Exhale, slowly bend to one side, pause, then strengthen up
- Repeat on the other side

Breathing Technique

- Inhale when stretching up
- Exhale when bending to the side and returning to position

Benefits

- Relieves back pain, improves spinal health
- Aids in weight loss, stretches waist and hips

Precaution:

- - Avoid during pregnancy, varicose veins, or headache
- - Consult a yoga therapist if you have insomnia or other health concerns

AS A PREVENTIVE ASANA AGAINST OBESITY & ASTHAMA

DHANURASANA (BOW POSE)

Step-by-Step Procedure:

- Lie prone with legs together.
- Bend knees and lift legs towards head.
- Hold ankles with hands and lift chest and head off ground.
- Hold for a few breaths, then release.

Benefits:

- Strengthens back muscles.
- Improves flexibility and balance.
- Tones abdominal organs.
- Relieves stress and anxiety.
- Improves digestion.

Precaution:

Avoid if you have back injuries, herniated discs, high blood pressure, or are pregnant.

AS A PREVENTIVE ASANA AGAINST OBESITY, DIABETES & ASTHAMA

GOMUKHASANA (COW FACE POSE)

Step-by-Step Procedure:

- Sit with legs crossed, one knee on top of the other
- Bring one knee over the other, and sit on the heels.
- Hold hands behind back, stretching shoulders and chest.
- Hold for a few breaths, then switch sides.

Benefits:

- Stretches shoulders, chest, and hips.
- Improves flexibility and balance.
- Relieves stress and anxiety.
- Improves posture.

- Tones arms and shoulders.

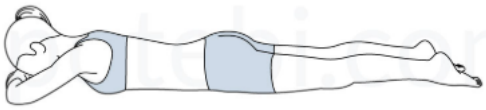
Precaution:

Avoid if you have shoulder or knee injuries.

AS A PREVENTIVE ASANA AGAINST DIABETES, ASTHAMA & HYPERTENSION

MAKARASANA (CROCODILE POSE)

Step-by-Step Procedure:



- Lie prone with forearms on ground.
- Lift chest and head off ground, stretching neck and shoulders.
- Hold for a few breaths, then release.

Benefits:

- Strengthens back muscles.
- Improves posture.
- Relieves stress and anxiety.
- Improves breathing and lung capacity.
- Tones neck and shoulder muscles.

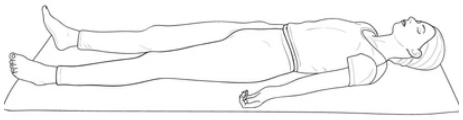
Contraindications:

Avoid if you have neck or back injuries.

AS A PREVENTIVE ASANA AGAINST HYPERTENSION & BACKPAIN

SAVASANA (CORPSE POSE)

Step-by-Step Procedure:



- Lie on back with arms and legs relaxed.
- Close eyes and focus on breath.
- Hold for 5-10 minutes, relaxing entire body.

Benefits:

- Relaxes entire body.
- Reduces stress and anxiety.
- Improves sleep.
- Lowers blood pressure.
- Improves mental clarity.

Contraindication:

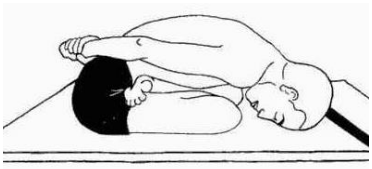
None, but be mindful of any underlying health conditions.

AS A PREVENTIVE ASANA AGAINST HYPERTENSION

MANDUKASANA (FROG POSE)

Step-by-Step Procedure:

- Squat with knees wide apart.
- Place hands on ground and stretch chest forward.
- Hold for a few breaths, then release.



Benefits:

- Stretches hips, thighs, and chest.
- Improves flexibility and balance.
- Tones legs and glutes.
- Relieves stress and anxiety.
- Improves digestion.

Contraindications: Avoid if you have knee or hip injuries.

AS A PREVENTIVE ASANA AGAINST DIABETES & BACKPAIN

USTRASANA (CAMEL POSE)

Step-by-Step Procedure:

- Kneel with knees hip-width apart.
- Arch back and reach hands to heels.
- Lift chest and head towards ceiling.
- Hold for a few breaths, then release.

Benefits:

- Stretches chest, shoulders, and abdomen.
- Improves flexibility and balance.
- Tones back muscles.
- Relieves stress and anxiety.
- Improves posture.

Contraindications:

Avoid if you have neck or back injuries, high blood pressure, or are pregnant.

AS A PREVENTIVE ASANA AGAINST OBESITY, DIABETES & ASTHAMA

MULTIPLE CHOICE QUESTIONS- 1 MARK

1. What is the meaning of "Asana" in Yoga?
(A) breathing exercises (B) physical postures
(C) meditation techniques (D) ethical practices
Answer: (B) physical postures
2. Which asana is known as the "Diamond Pose"?
(A) Trikonasana (B) Vajrasana
(C) Tadasana (D) Shavasana
Answer: (B) Vajrasana
3. Which asana is recommended to prevent constipation?
(A) Vajrasana (B) Trikonasana
(C) Ardha Matsyendrasana (D) Tadasana
Answer: (C) Ardha Matsyendrasana
4. Name the asana shown in the picture given below.

(A) Vajrasana (B) Pachimotanasana
(C) Trikonasana (D) Ardha Matsyendrasana
Answer: (B) Pachimotanasana
5. Asana that helps to make pelvic muscles strong is:
A) Shavasana
B) Trikonasana
C) Tadasana
D) Vajrasana
Answer: B) Trikonasana
6. What is the Sanskrit word for "Yoga"?
(A) Yuj (B) Ananda
(C) Atma (D) Prana
Answer: (A) Yuj
7. Who is considered the father of Yoga?
(A) Patanjali (B) Buddha
(C) Swami Vivekananda (D) B.K.S. Iyengar
Answer: (A) Patanjali
8. What is the meaning of "Pranayama"?
(A) physical postures (B) meditation techniques
(C) breathing exercises (D) ethical practices
Answer: (C) breathing exercises
9. Name the asana in the picture given below. .

(A) Tadasana (B) Vajrasana
(C) Trikonasana (D) Dhanurasana
Answer: (D) Dhanurasana

10. Which asana is recommended to prevent diabetes?
(A) Tadasana (B) Shavasana
(C) Vajrasana (D) Trikonasana
Answer: (C) Vajrasana
11. Ushtrasana pose referes to :
a. Camel pose b. Cow pose
c. Fish pose d. Cobra pose
Answer: a. Camel pose
12. Which asana is of side twist pose?
a. Shavasana b. Chakrasana
c. Ardha Mastendrasana d. Parvatasana
Answer: c. Ardha Mastendrasana
13. Causes of obesity include:
A) Lack of physical activity B) Smoking
C) Overeating D) All of the above
Answer: D) All of the above
14. Which gland secretes the hormone insulin, the lack if which is associated with Diabetes?
a. Endocrine glands b. Pituitary
c. Pancreas d. Hypothalmus
Answer: c. Pancreas
15. Katichakrasana is a
a. standing asana b. Sitting asana
c. Lying asana d. Balancing asana
Answer: d. Balancing asana

Unsolved Questions

1. Bhujangasana is also known as
a. Dog posture b. Child posture
c. Cobra posture d. Reverse Boat posture
2. Which asana can be suggested as a preparatory asana for Bhujangasana?
A) Tadasana B) Shavasana
C) Makarasana D) Padmasana
Answer: C) Makarasana
3. What causes Hypertension?
a. Excessive insulin secretion b. Smoke
c. Food d. All of the above
4. In Uttanpadasana which is the correct pose?
a. Legs raised in supine position b. Legs raised in prone position
c. Head raised in supine position d. Head and led raised in prone position
5. Which asana is the basic asana for relaxation and mental repose?
a. Shavasana b. Chakrasana
c. Halasana d. Parvatasana

VERY SHORT ANSWERS – 2 MARKS

Q.1. What is Yoga?

Ans. The word yoga is derived from Sanskrit word 'Yuj' which means 'to meet'. So, yoga is the union of body with soul.

Q.2 Write any two benefits of Vajrasana in the medical condition called obesity.
Ans Two benefits of Vajrasana are as follows

- It helps to prevent acidity and ulcers by improving the digestion.
- It is a good meditative pose for those suffering from sciatica and severe lower back problems.

Q-3 Write any two benefits of Tadasana.

Improves Posture: Tadasana helps align the spine and strengthens the muscles that support good posture, promoting a straight and upright stance.

Enhances Balance and Stability: By engaging core muscles and focusing on standing evenly on both feet, Tadasana improves body awareness and balance.

Q-4 Write any two benefits of Mandukasana.

Ans Two benefits of Mandukasana are as follows

- Mandukasana stimulates the abdominal organs and pancreas, which can help improve digestion and support better functioning of the digestive system.
- This pose is believed to stimulate the pancreas and may help regulate insulin production, making it beneficial for people managing diabetes.

Q-5 Explain the contraindication of Halasana
Ans In case of shoulder or neck injuries, experiencing dizziness while staring upwards and in case of any other medical concerns.

Q-6 What do you understand by the Ardha Matsyendrasana?
Ans Ardha Matsyendrasana or the half spinal twist pose is one the main asanas practised in hatha yoga. This yoga helps in stimulating the liver. It is also therapeutic for asthma and infertility etc.

Q-7. Discuss any two benefits of Paschimottasana.
Ans Two benefits of Paschimottasana are as follows

- It helps to remove constipation and digestive disorder.
- It reduces headache, anxiety and insomnia.

Q-8. How is Diabetes defined and what are its symptoms?

Ans: Diabetes is a common metabolic and lifestyle disorder. It is caused by high levels of sugar in blood and urine. Insulin, a hormone secreted by pancreas, control the level of sugar in blood. Insufficient production of insulin increases sugar level in blood. When this imbalance is not corrected ,it can lead to heart and kidney diseases, vision impairment and other problems. Lethargy, fatigue, slow healing of wounds, poor immunity, weight loss, frequent urination, and excessive thirst are its common symptoms.

Q-9. How is Asthma described and how can it be managed?

Ans : Asthma is a chronic respiratory condition causing inflammation and narrowing of the airways, leading to breathing difficulties. It's characterized by symptoms like wheezing, coughing, shortness of breath, and chest tightness, which can worsen during attacks. Asthma is managed with medications and strategies to avoid triggers and maintain control.

Q-10. How is Hypertension explained and when is it diagnosed?

Ans: Hypertension, or high blood pressure, is a condition where the force of blood against the artery walls is consistently too high. It's a major risk factor for heart disease, stroke, and other serious health problems. Hypertension is usually diagnosed when a person's blood pressure readings consistently reach 130/80 mmHg or higher.

Unsolved Questions

Q-1. Explain the meaning and common causes of back pain.

Q-2. Define obesity and mention its impact on health.

Q-3. Describe arthritis and its effects on the human body.

Q-4. Name any three meditative asanas.

Q-5. Write any three contraindications of Bhujangasana.

SHORT ANSWERS – 3 MARKS

Q.1 Explain the procedure of Pawanmuktasana.

- This is done in lying position.
- Lie flat on the back and keep the legs straight, relax, breathe deeply and regularly.
- Inhale slowly and lift the legs and bend the knees. Bring upwards to the chest till the thigh touches the stomach.
- Hug the knees in place and lock the fingers.
- Place the nose tip between the knees.
- Exhale slowly and come back to the original position i.e. Shavasana.
- This is very beneficial for the stomach, for developing the abdominal muscles. The results are very impressive.

Q.2. Define the term Asana. Write about the categories of Asanas.

Ans. The term asana means siting in a particular posture, which is comfortable and which could be maintained steadily for long time. Asana gives stability and comfort both at physical and mental level.

Asana may broadly be classified into three categories:

1. Cultural or corrective asana
2. Meditative asana
3. Relaxative asana

- Cultural asanas can further be classified into two groups, depending on the effects produced.
  - ✓ asana that work through and on the spine and visceral organs.
  - ✓ asanas that work through the skeleton, muscus, ligaments and joints.
- Meditative asana are those asanas which are aimed at quite sitting and are used for higher practices in yoga.
- Relaxative asana are those which remove tension and bring about physical as well as mental relaxation.

Q.3. Write steps and benefits Vajrasana.

Ans. Steps

- Sit on the flat floor and fold your legs. Keep the spine straight and close the eyes.
- Keep the right palm on right knee and left palm on left knee.
- Now start to inhale slowly then exhale. When you exhale try to think that your disorders are coming out from your nose.
- Repeat these steps for 5 minutes and take a rest. You can increase the time for 15 minutes.

Benefits

- Calms the mind and bring stability in mind.
- Cures constipation, acidity, increases digestion.
- Those suffering from the problem of gas formation in the intestines can practice this immediately after lunch or dinner.
- Helps to get rid of back pain.
- Cures stomach disorder.
- Cures urinary problems.
- Strengthens the sexual organs.

Q.4. Explain briefly how Yoga helps in the medical condition of Diabetes.

Ans. Yoga postures for diabetes switch back and forth between asanas (poses) that contract specific areas of the abdomen and asanas that relax those areas. This alternation between abdominal contractions and release stimulates the pancreas thus increasing the blood and oxygen supply. As a result, the pancreatic cells, hit by nutrients and fresh blood flow, undergoes a rejuvenation that improves the organ's ability to produce insulin. Yogic breathing practices also work in a similar way to stimulate

healthy pancreatic function. In addition to this,yoga reduces blood sugar levels and helps relieve one of the main symptoms of diabetes i.e. hypoglycemia. Yogic exercise also reduces LDL (”bad”) cholesterol and triglyceride levels, both of which are often accompanying symptoms for diabetes.

Q.5. Explain Hypertension and mention curative asanas of Hypertension.

Ans. Yoga and meditation play an important role in lowering high blood pressure (hypertension) thereby improving the lifestyle through mental relaxation and stress reduction. For management and control of hypertension, Yoga and Naturopathy are beneficial steps.

- Katichakrasana is a useful yoga pose to relieve from hypertension.
- Bhujangasana is quite useful in normalising blood pressure.
- Dhanurasaana keeps your tiredness away.
- Shavasana may be practiced when blood pressure is to be controlled and in case of tiredness.
- Chandrabhedi pranayama also lowers blood pressure.

Q.6. Describe the benefits and procedure of Bhujangasana.

Procedure:

- Lie flat on your stomach with legs straight and feet together, toes pointing outward.
- Place your palms under your shoulders and elbows close to your body.
- Inhale slowly and raise your upper body (head, chest, and abdomen) using the strength of your back muscles, with minimal support from your hands.
- Look upward and hold the posture for a few seconds while breathing normally.
- Exhale and slowly bring your body back to the floor.
- Repeat 2–3 times.

Benefits:

- Strengthens the spine and improves flexibility.
- Stimulates abdominal organs and improves digestion.
- Opens the chest and helps relieve stress and fatigue.
- Improves blood circulation and is beneficial for people with mild back pain.
- Useful in managing hypertension when practiced calmly.

UNSOLVED QUESTIONS

Q-1 Write steps and benefits of Tadasana.

Q-2 Define Dhanurasana and write 3 benefits of Dhanurasana.

Q-3 Define Mandukasana and write any 2 Contraindications of Mandukasana.

CASE BASED QUESTIONS – 4 MARKS

1. **A 40-year-old individual with type 2 diabetes is looking to incorporate yoga into their management plan. Create a yoga routine that includes asanas, pranayama, and relaxation techniques to improve insulin sensitivity, reduce stress, and enhance overall well-being.**

1. Which of the following yoga asanas is most effective in stimulating the pancreas and improving insulin sensitivity?
A) Tadasana B) Bhujangasana C) Vajrasana D) Shavasana
Answer: B) Bhujangasana

2. Which pranayama practice helps in reducing stress and calming the nervous system, which is beneficial for managing diabetes?
A) Bhastrika B) Kapalbhati C) Anulom Vilom D) Surya Bhedi
Answer: C) Anulom Vilom

3. For someone managing type 2 diabetes through yoga, which of the following is a recommended relaxation technique?
A) Vrikshasana B) Shavasana C) Trikonasana D) Dhanurasana
Answer: B) Shavasana

4. What is the primary benefit of incorporating yoga into the diabetes management plan?
A) Increases sugar cravings
B) Raises blood pressure
C) Improves insulin sensitivity and reduces stress
D) Causes muscle stiffness
Answer: C) Improves insulin sensitivity and reduces stress

2. **A 25-year-old individual with asthma is seeking to manage their symptoms through yoga. Design a yoga program that includes asanas, pranayama, and relaxation techniques to improve lung function, reduce stress, and enhance overall well-being.**

1. Which of the following yoga asanas is especially helpful for expanding the chest and improving lung capacity in asthma patients?
A) Paschimottanasana B) Bhujangasana C) Matsyasana D) Padmasana
Answer: C) Matsyasana

2. Which pranayama technique is best suited for calming the respiratory system and enhancing breathing efficiency in asthma?
A) Bhramari Pranayama B) Surya Bhedi Pranayama
C) Bhastrika Pranayama D) Ujjayi Pranayama
Answer: A) Bhramari Pranayama

3. Which relaxation technique is beneficial for reducing stress and preventing asthma attacks triggered by anxiety?
A) Tratak B) Shavasana
C) Dhanurasana D) Surya Namaskar
Answer: B) Shavasana

4. What is one of the primary goals of yoga for individuals with asthma?

A) Strengthen leg muscles
B) Increase appetite
C) Improve lung function and reduce stress
D) Suppress sneezing
Answer: C) Improve lung function and reduce stress

3. **A 50-year-old individual with hypertension is looking to incorporate yoga into their management plan. Create a yoga routine that includes asanas, pranayama, and relaxation techniques to reduce blood pressure, improve cardiovascular health, and enhance overall well-being.**

1. Which yoga asana is most beneficial for calming the nervous system and reducing high blood pressure?
A) Chakrasana B) Shavasana C) Trikonasana D) Garudasana
Answer: B) Shavasana

2. Which of the following pranayama techniques is best suited for reducing blood pressure and promoting mental relaxation?
A) Kapalbhati B) Bhastrika C) Anulom Vilom D) Surya Bhedi
Answer: C) Anulom Vilom

3. Why should fast or forceful breathing techniques be avoided in individuals with hypertension?
A) They improve flexibility
B) They may increase heart rate and blood pressure
C) They help reduce cholesterol
D) They cause dizziness
Answer: B) They may increase heart rate and blood pressure

4. Which asana is safe and effective for reducing stress and improving circulation in people with hypertension?

A) Halasana B) Shirshasana C) Vajrasana D) Dhanurasana
Answer: C) Vajrasana

4. **Ravi, a 25-year-old man, has been experiencing frequent episodes of shortness of breath, wheezing, and coughing, especially during seasonal changes and physical exertion. He was diagnosed with asthma two years ago. Recently, his doctor advised him to add yoga to his lifestyle to help manage his condition. Ravi joins a beginner-friendly yoga class that focuses on breathing techniques, gentle asanas, and relaxation. Over time, he notices that his breathing improves, his stress levels decrease, and he feels more energetic.**

1. Which of the following yoga practices is most beneficial for improving lung capacity in asthma patients?
A) Bhramari Pranayama B) Surya Bhedi C) Kapalbhati D) Ujjayi Pranayama
Answer: A) Bhramari Pranayama

2. Which of these asanas helps open the chest and lungs, making it easier to breathe?
A) Halasana B) Bhujangasana C) Paschimottanasana D) Dhanurasana
Answer: B) Bhujangasana

3. Why is yoga effective in managing asthma symptoms?
A) It increases blood pressure
B) It strengthens the immune system and calms the mind
C) It blocks nasal passages
D) It restricts lung function
Answer: B) It strengthens the immune system and calms the mind

4. Which relaxation technique is most suitable for reducing stress-related asthma triggers?
A) Chakrasana B) Savasana C) Shirshasana D) Trikonasana
Answer: B) Savasana

5. **Amit, a 30-year-old software professional, spends long hours sitting at a desk. Over the past year, he has developed chronic lower back pain due to poor posture and lack of physical activity. On the advice of a physiotherapist, Amit joins a yoga class to strengthen his back, improve flexibility, and manage pain. His instructor designs a routine including gentle backbends, spinal twists, core strengthening asanas, pranayama, and relaxation. After a few weeks, Amit experiences reduced pain and better posture, with increased flexibility and mental relaxation.**

1. Which of the following asanas is most beneficial for strengthening the lower back muscles?
A) Bhujangasana B) Padmasana C) Halasana D) Tadasana
Answer: A) Bhujangasana

2. Which pranayama technique is recommended to reduce stress and promote healing in individuals with chronic back pain?
A) Bhastrika B) Anulom Vilom
C) Surya Bhedi D) Kapalbhati
Answer: B) Anulom Vilom

3. Which asana helps in stretching the spine and relieving pressure on the vertebral discs?
A) Vajrasana B) Dhanurasana
C) Marjariasana (Cat-Cow Stretch) D) Matsyasana
Answer: C) Marjariasana (Cat-Cow Stretch)

4. Which relaxation technique is most suitable at the end of a yoga session for someone with back pain?

A) Shirshasana B) Ustrasana
C) Savasana D) Trikonasana
Answer: C) Savasana

Unsolved Questions

Q-1 Gunjan, a Yoga instructor at XYZ School was consulted by a student of class XI with regard to her over weight. The child wants to do asanas to reduce her weight.

A. Gunjan has asked the child to practice_____
A) Paschimottanasana B) Gomukhasana
C) Chakrasana D) Vajrasana

B. While practicing this asana the child should not be suffering from_____

A) Joint pain B) High BP

C) Scurvy D) Constipation

C. This asana is a_____ asana.

A) Standing B) Relaxative

C) Meditative D) Lying

D. What is the primary benefit of practicing Paschimottanasana for an overweight student?
A) Improves memory
B) Enhances lung capacity
C) Burns belly fat and tones abdominal muscles
D) Strengthens wrist joints

Q-2 Geetha, the yoga teacher does regular yoga activities in her house with family. It helps to improve her family health. One day her neighbour, Sheela came to her house with her daughter. Sheela's daughter is 14 but has short height. Geetha advised her to do some asanas regularly to increase her height.

1. Which asana can be advised by Geeta?

(A) Tadasana (B) Bhujangasana

(C) Sukhasana (D)Both a & b

2. Vajrasana provides relief from----

(A) Back pain (B) Constipation

(C) Headache (D) Both a & b

3. Which is the asana that can be used to cure obesity?

(A) Pawanmuktasana (B) Matsyasana

(C) Shavasana (D) Trikonasana

4. What is the benefit of involving the whole family in yoga practice, as Geetha does?
A) It increases household chores
B) It improves family bonding and overall health
C) It causes physical exhaustion
D) It reduces communication among members

VERY LONG ANSWERS – 5 MARKS

Q.1. Explain Gomukhasana and write steps and benefits of Gomukhasana.

Ans. Sitting by placing both the feet on the ground by the side of the buttocks and keeping the body steady is Gomukhasana, resembling the mouth of a cow.

Steps

- Sit erect stretching both legs together in front, hands by the side, palm resting on the ground, fingers of the hands together.
- Fold right leg at the knee and place it on the ground by the side of the left buttock.
- Similarly bring the left leg from above the right leg, place it on the ground by the side of the right buttock. Out towards left and right side.
- Place the palms on the knee one above the other and sit erect.

Benefits

- It helps you relax,when you feel tense or worried.
- It will help release the tension.
- It stimulates the kidneys.
- It is helpful in relieving ailments like diabetes, high blood pressure, and sexual malfunction.

Q.2. Explain Parvatasana and write steps and benefits of Parvatasana

Ans. It is one of the important yoga postures. It has immense benefits and is one among the yoga postures for weight loss. As the pose resembles a mountain, it is called parvatasana.

Steps

- Sit down on the floor in a cross legged position or Sukhasana (easy pose). You can also sit down by spreading the legs a little more than the hip width or in Padmasana (lotus pose).
- Bring your hand in front of you and interlock the fingers so that your palms are facing towards you.
- Breathe out and move your hands over head. Keep your fingers interlocked and hands stretched upwards.
- Put your torso in upward direction and stretch as much as much as you can.

Benefits

- It gives a full body stretch which improves the blood circulation around the body.

- It makes you alert and attentive if you are feeling bored, sleepy or losing interest in doing work.
- It improves your mental efficiency and makes you more optimistic.
- It strengthens the weak muscles of the body and thus prevents any injury.

Q.3. Explain Paschimottasana and write steps and benefits of Paschimottasana.

Ans. This asana is commonly known as the forward Bend Pose and it involves the whole body, stretching all vital parts from head to toe. This particular asana is recommended to many people who have been diagnosed with diabetes.

Steps

- Sit down on your yoga mat and keep your back straight. Place the legs in front and stretch them as well.
- Move your hands upwards and keep them straight and placed beside your ears. Remember to keep fingers straight and pointing upwards as well.
- Inhale as deeply as you can without bringing any your hands down.
- Bend the body forward and hold your toes with your hand's index and middle fingers. Exhale during this step.

Benefits

- It is a known anxiety buster.
- Improves the spine's ability to stretch and in the process, strengthens it.
- Toning several abdominal organs.
- Many women are recommended this asana particularly after delivery.

UNSOLVED QUESTIONS

Q-1 Explain Matsynasana and write steps and benefits of Matsynasana.

Q-2 Explain Shavasana and write steps and benefits of Shavasana.

UNIT-IV

PHYSICAL EDUCATION & SPORTS FOR CWSN

CONTENT:

4.1 Organization promoting disability sports
(Special Olympics, Paralympics, Deaflympics)

4.2Concept of Classification and Divisioning in Sports;

4.3 Concept of Inclusion in sports, its need, and Implementation

4.4 Advantage of Physical Activities for children with special needs

4.5 Strategies to make Physical Activities accessible for children with special needs.

Learning Objectives:

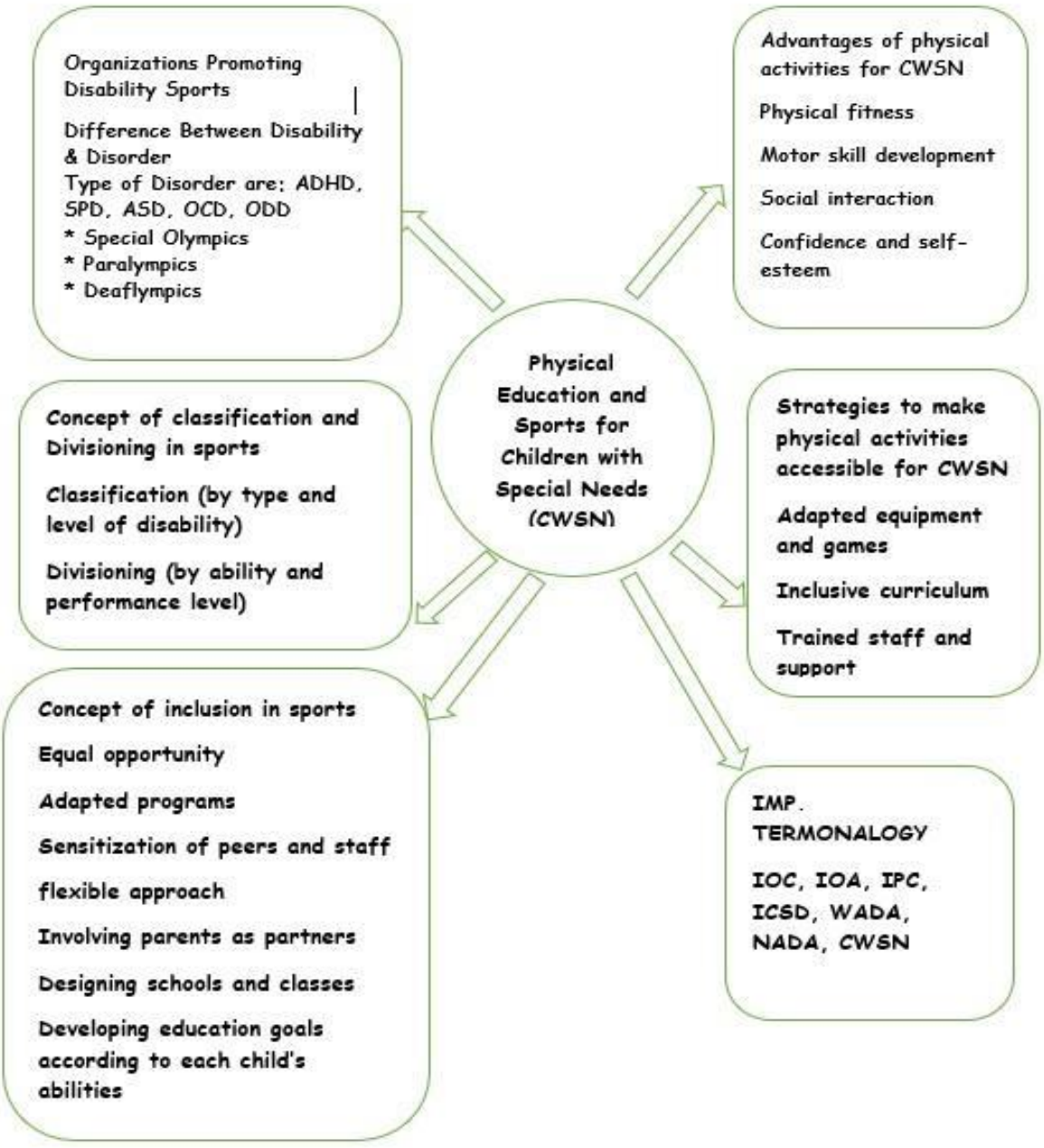
1. Learn about organizations like Special Olympics, Paralympics, and Deaflympics that promote sports for people with disabilities.
2. Understand the concept of classifying and dividing athletes based on their abilities to ensure fair competition.
3. Inclusion in Sports:
4. Explore the need and implementation of inclusion in sports, which allows individuals with disabilities to participate alongside their peers.
5. Discover the advantages of physical activity for CWSN, such as improved physical health, motor skills, and social skills.
6. Examine strategies to make physical activities accessible to children with special needs, including adaptations and modifications.

Learning Outcomes

1. Appreciate advantages of physical activities for children with special needs
2. Differentiate between methods of categorization in sports for CWSN
3. Understand concepts and importance of inclusion in sports
4. Create advantages for Children with Special Needs through Physical Activities
5. Strategies to make physical activities accessible for children with special needs

MIND MAP

WEIGHTAGE 04+04b*



1 ORGANIZATIONS PROMOTING DISABILITY SPORTS

Organizations promoting disability sports play a vital role in empowering individuals with disabilities to participate in sports and physical activities. The International Paralympic Committee provides opportunities for individuals with disabilities to develop their skills, build confidence, and compete at various levels.

- To Empower individuals: Build confidence and self-esteem in individuals with disabilities.
- To Foster inclusion: Promote social inclusion and equality for individuals with disabilities.
- To Develop athletic talent: Identify and develop the skills of athletes with disabilities.

Overall, disability sports play a crucial role in empowering individuals with disabilities, promoting inclusion in sports and physical activities.

DIFFERENCE BETWEEN DISABILITY & DISORDER

DISABILITY:

1.Disability is a physical, mental or cognitive condition that impairs, interferes with, or limits the person's ability to engage in certain actions to participate in daily activities.

2. There is no chance to become normal

3.Disability is concerned with various parts of the body

It is of three main types –

1. Cognitive,
2. Intellectual
3. Physical

DISORDER

1. Disorder is an illness or dysfunctional factor that affects or disrupts the person physically or mentally.
2. There are high chances to become normal
3. Disorder is concerned with mental ability

Type of Disorder Are: -

- ADHD (Attention Deficit Hyperactivity Disorder)
- SPD (Sensory Processing Disorder)
- ASD (Autism Spectrum Disorder)
- OCD (Obsessive Compulsive Disorder)

- ODD (Oppositional Defiant Disorder)

The organisations which promote disability sports are the following:

1. **Special Olympics**
2. **Paralympics**
3. **Deaflympics**

4.1.1 SPECIAL OLYMPICS

Special Olympics International was started by Eunice Kennedy Shriver, sister of John F Kennedy, the former President of USA. She believes that with equal opportunities and experience as anyone else, people with intellectual disabilities could compete more than ever thought possible.

First special Olympics were held in July 1968 in Chicago. About 1000 athletes from the USA and Canada participated in one day event. In 1988, the Special Olympics were officially organised by International Olympic Committee. Special Olympic Bharat was founded in 1987 as Special Olympics India, and changed its name to

Special Olympics Bharat. In 2001 Special Olympics Bharat came into existence. This National Sports Federation got registered under the Indian Trust Act 1882. Later in 2006, Government of India gave recognition to this Federation with an aim to develop sports among persons with Intellectual Disabilities. Special Olympics Bharat is also recognized by Special Olympics International.

OBJECTIVES OF SPECIAL OLYMPICS

The objectives of Special Olympics are to reach out to every one with disabilities and their families.

The mission of Special Olympics is to provide year-round sports training and athletic competition in a variety of Olympic-type sports for children and adults with intellectual disabilities.

Special Olympics do this through a wide range of training, competitions, health screenings and fund -raising events. This helps them to develop physical fitness, demonstrate courage and experience the joy of participation.

SPECIAL OLYMPICS LOGO

The Logo of Special Olympics is based on the sculpture “Joy and Happiness to All the Children of the World” by Zurab Tsereteli. The logo is a symbol of growth, confidence and joy among children and adults with disabilities who are learning coordination, mastering skills, participating in competitions and preparing themselves for richer, more productive lives.

SPECIAL OLYMPIC FLAME

The flame of hope is a symbol of the Special Olympics. It is lit during a special traditional ceremony in Athens, Greece, in the months running up to the Special Olympic World Games. It is then relayed on foot by Special Olympics.

SPECIAL OLYMPIC OATH

This was first introduced by Eunice Kennedy Shriver at the inaugural function of Special Olympics international games in Chicago in 1968, ‘Let me win. But if I cannot win, let me be brave in the attempt’.

"Let me win. But if I cannot win, let me be brave in the attempt."

Programmes run by Special Olympics around the world

ACTIVITIES OF SPECIAL OLYMPIC BHARAT

- Training in Sports
- Building Leadership
- Promotion of Healthy Athletes

4.1.2 PARALYMPICS

The Paralympics or Paralympic Games are the largest international sports events organised for disabled athletes which are held in the same style as the Olympic Games.

The word 'Para' derives from the Greek preposition 'para' (beside or alongside) and thus refers to the competition held in parallel with the Olympic Games.

The Paralympics are held immediately following the respective Olympic Games in the same host city and venue. Athletes with a variety of physical and intellectual disabilities including mobility disabilities, amputation, blindness, short stature and cerebral palsy participate in Paralympics.

International Paralympic Committee (IPC) was formed on 22 September 1989 and is situated in Bonn, Germany. IPC organizes summer and Winter Paralympic Games and coordinates world championships and other competitions.

The Paralympic Committee of India is the body responsible for selecting athletes to represent India at the Paralympic Games and other international athletic meets and for managing the Indian teams at the events. The organisation was founded in 1992 as the Physically Handicapped Sports Federation of India.

VISION OF PARALYMPICS

To enable Paralympics athletes to achieve sporting excellence and to inspire and excite the world.

PARALYMPIC ANTHEM

"ANTHEM OF FUTURE' (Hymne De L' Avenire)"

It was composed by Thierry Darnis and adopted as the official anthem of the IPC in March 1996.

PARALYMPIC SYMBOL

(three Agitos – in Latin means 'I move') consists of three elements in Red, Blue and Green. These three colours are widely represented in national flags around the world. The 3 Agitos encircling a central point symbolise motion

PARALYMPIC MOTTO: "*SPIRIT IN MOTION"*

Representing the strong will of every Paralympian. Introduced in 2004 at the Athens Paralympics games

CATEGORIES OF DISABILITIES AS RECOGNISED BY IPC

PHYSICAL IMPAIREMENT

- Impaired muscle power due to the spinal cord injury or post-polio syndrome.
- Impaired passive range of movement due to reduced systematic movement of joints
- Short stature
- Leg-length difference
- Loss of limb or limb deficiency since birth or because of an injury sustained leading to amputation. Also, diseases like cancer that lead to removal of the limb.
- Hypertonia: abnormal increase in muscle tension that reduce the ability of a muscle to stretch, due to damage to the central nervous system, as in cerebral palsy, traumatic brain injury and stroke.
- Ataxia: Ataxia leads to lack of coordinated of muscle movements that may occur due to cerebral palsy & brain injury
- Athetosis: occur due to unbalanced involuntary movements and difficulty in maintaining symmetrical posture of the body. Can occur because of cerebral palsy or injury to the brain and after getting a stroke.

VISUAL IMPAIRMENT

Reduced or total loss of vision from damage to the eye structure, optical nerves or optical pathways, or visual cortex of the brain.

INTELLECTUAL IMPAIRMENT

Impairment before the age of 18 leading to a restriction in intellectual functioning and adaptive behaviour are categorised under this group.

4.1.3 DEAFLYMPICS

Motto- *'Equality through Sports'*

Deaflympic are equivalent to the Olympic Games but for deaf athletes Founded in 1924.The term 'Deaflympics' was formally adopted in 2001

The first games, known as The Silent Games, held in 1924, were the first games ever for athletes with a disability. In 1924 in Paris, France, 148 athletes from nine European nations took part in the games. The first Winter Games, held in Seinfeld, Austria, in 1949, included 33 athletes from five nations.

The event was organized by Le Comité International des Sports Silencieux (the International Committee of Silent Sports), commonly known as the CISS which was formed in 1924 at France. In 1955, the CISS was admitted into the International Olympic Committee, the IOC, as an International Federation with Olympic standing. The flag of the IOC has flown next to the flag representing CISS/ICSD at the summer/ Winter Deaflympics since 1985.

THE LOGO OF DEAFLYMPICS:

Designed in 2003 is a positive and powerful symbol of the international deaf sports community. It ties together strong elements: Sign language and international cultures, unity and continuity.

The hand shapes, "ok", "good", and "great" that overlap each other in a circle, represent the original sign for "Deaflympics". Together, the hand shapes represent the sign for "united".

MISSION

According to the International Committee of Sports for the Deaf (ICSD), the mission of the Deaflympics Games is given below:

- To supervise the organisation of successful summer and winter Deaflympics events.
- To promote and contribute to the development of sports opportunities and competitions, from grass-root to elite level for deaf athletes.
- To support and encourage educational, cultural, research and scientific activities that contribute to the development and promotion of the Deaflympics.
- To fully enforce a drug-free sport environment for all the deaf athletes in conjunction with the World Anti-Doping Agency (WADA)
- To promote sports for deaf athletes without discrimination due to political, religious, economic, gender or racial reasons.
- To strive for higher numbers of better athletes with higher standards for excellence.
- To achieve a significant level of international recognition.

ELIGIBILITY

Athletes must have a hearing loss of a minimum 55 dB to participate in Deaflympics. No hearing aids are allowed to be used in the competition.

Visual tools are used such as a flag wave and flash of light.

The spectators of the Deaflympics are expected to wave with their hands instead of cheering by clapping their hands.

MOTTO

Motto of Deaflympics Games "Per Ludos Aequalitas" means *'Equality through Sports and stick to the ideals of the Olympics"*.

4.2 CONCEPT OF CLASSIFICATION AND DIVISIONING IN SPORTS

The concept of Classification and Divisioning is a process used in disability sports for providing even and fair competition for athletes with disability through grouping of athletes.

The purpose is very much similar to grouping system used in mainstream sports according to their age-group, gender, weight etc. The general goal of any classification or Divisioning in disability sports is to reduce or minimize the effect of sports performance due to any of the above-mentioned variables like age, gender, weight or even abilities.

'***Classification'*** is a grouping process associated with Paralympics and Para-athletes, and

'***Divisioning'*** is a process of grouping associated with Special Olympics.

Classification process adopted by Paralympics assigns categories to athletes based on different types of disabilities, on the other hand Divisioning process of Special Olympics is a performance-based system of grouping athletes based on their skill level.

4.2.1 Classification in Paralympics

Classification is undertaken to ensure that an Athlete's impairment is relevant to sport performance, and to ensure that the Athlete competes equitably with other Athletes" with fair chance to all participant athletes engaging in competitive sports.

According to the IPC, the classification process serves two roles. The first is to determine who is eligible and the second is to group athletes for the purpose of competition. The eligibility minimum is an impairment that limits the sportsperson's ability to participate in an activity and the disability needs to be permanent in nature.

Classification for Paralympics sports generally have the following steps:

- The first step is generally a medical assessment.
- The second is generally a functional assessment which involves two parts: first observing a sportsperson in training and second observing the sportsperson in competition.
- There are a number of people involved in this process beyond the sportsperson, including individual classifiers, medical classifiers, technical classifiers, a chief classifier, a head of classification, a classification panel and a classification committee.

4.2.2 Classification for Paralympics (Eligible Impairment)

It defines the impairment group in which an athlete can compete in the various sports.

It groups athletes in classes defined by the degree of activity-limitation related to the impairment and/or specific to the task in the sport.

The IPC has established ten disability categories, including physical, visual, and intellectual impairment. Athletes with one of these disabilities can compete in the Paralympics though not every sport can be allowed for every disability category. These categories apply to both summer and Winter Paralympics.

1. **Physical Impairment –**

There are eight different types of physical impairment

- **Impaired muscle power** – With impairments in this category, the force generated by muscles, such as the muscles of one limb, one side of the body or the lower half of the body is reduced. e.g., spinal cord injury, spina bifida, post-polio syndrome.
- **Impaired passive range of movement** – The range of movement in one or more joints is reduced in a systematic way. Acute conditions such as arthritis are not included in this category.
- **Loss of limb or limb deficiency** – A total or partial absence of bones or joints from partial or total loss due to illness, trauma, or congenital limb deficiency. Eg: amputation, dysmelia.
- **Leg-length difference** – Significant bone shortening occurs in one leg due to congenital deficiency or trauma.
- **Short stature** – Standing height is reduced due to shortened legs, arms and trunk, which are due to a muscle-skeletal deficit of bone or cartilage structures. e.g., achondroplasia, growth hormone deficiency, osteogenesis imperfecta.
- **Hypertonia** – Hypertonia is marked by an abnormal increase in muscle tension and reduced ability of a muscle to stretch. Hypertonia may result from injury, disease, or conditions which involve damage to the central nervous system. Eg: cerebral palsy.
- **Ataxia** – Ataxia is an impairment that consists of a lack of coordination of muscle movements. Eg: cerebral palsy, Friedreich's ataxia, multiple sclerosis.
- **Athetosis** – Athetosis is generally characterized by unbalanced, involuntary movements and a difficulty maintaining a symmetrical posture (e.g. cerebral palsy, choreoathetosis).

4.2.3 Divisioning in Sports by Special Olympics

Special Olympics uses a competitive-level matching referred to as 'Divisioning', which is a fundamental rule at Special Olympics. Athletes in competitions are matched with others of the same gender, about the same age and most importantly, of about the same competitive ability. In Special Olympics the athletes will compete with other athletes of their similar abilities.

4.2.4 Implementation of Divisioning

An athlete's ability is the primary factor in Divisioning Special Olympics competitions. The ability of an athlete or team is determined by an entry score from a prior competition or the

result of a seeding round or preliminary event at the competition itself. Other factors that are significant in establishing competitive divisions are age and sex. In the process of Divisioning, athletes are firstly categorised as per their age group which is different for individual and team sports, followed by gender and lastly by their ability.

4.2.5. Process of Divisioning:

1. **Age**

Team Sports	Individual Sports
15 & under	8-11 years
16-21 years	12-15 years
22 & above	16-21 years
	22-29 years
	30 & above

2. **Gender**: In the second step, athletes are grouped as per gender, in some circumstances gender can be combined too.
3. **Ability**: Finally, athletes in Special Olympics are grouped according to their skill abilities' scores which are recorded by committee through preliminary and on-site events.
4. **Pre-competition information and scores** are used to place individuals or teams in preliminary rounds. on-site preliminary events (timed heats or team observations) are conducted to verify or modify divisions for the final competition.
5. **Maximum Effort Rule**: To achieve the intentions of fairness, there is a 'maximum efforts rule', wherein athletes are expected to give their maximum effort during Divisioning process and coaches are expected to motivate all athletes towards giving their best.

4.3 Concept of Inclusion in Sports, its need and implementation

With the introduction of the Right to Education, which makes education a fundamental right of every child between the ages of 6 and 14, all children – including those who are physically and mentally challenged, or afflicted with various types of disabilities and disorders – have the right to come to school to develop their abilities through the process of education. It is, therefore, the duty of all schools to provide them with such opportunities that they develop their learning

4.3.1 Encouraging Inclusion through Physical Education and Sports

Role of Family – The role of family in encouraging a healthy, sports-oriented lifestyle for a child with a disability is crucial. At times the family may find it difficult to accept reality, and may give up on the child. It is essential to promote awareness and to treat a CWSN as equal in the family. A CWSN may require a structured life routine where participation in recreational games and sports plays a very important role in developing a healthy mind and body of the child. Parents should observe certain different abilities of the child and take professional help to enable her/him to excel in the area.

Role of School – School gives a structured programme to a child or a group where co-scholastic activities (drawing, poem, Olympiads etc.) and sports are a part of the regular routine. All schools must have trained APE teachers to give a specially-abled child access to games where equipment and movements are adapted in a fun way for her/his holistic development. Here, a teacher or a coach helps a child to transit towards competitive sports under different organizations such as Special Olympics, Paralympics etc. The school should take care to provide infrastructure that is compatible with the needs of CWSN Eg: a ramp along with stairs. Schools must organise intramural and extramural sports competitions.

Role of Organisations – There are some organizations working at the grass root level to promote adapted sports. These organizations are responsible for training teachers and coaches for teaching, coaching and organizing sports events at Zonal, District, State, National and International levels

4.3.2 INCLUSION - ITS NEEDS AND IMPLICATION

Inclusion in education refers to a model wherein CWSN spend most or all of their time with students with non-special needs.

Each individual is different in terms of his physical, social, emotional and cognitive characteristics. This diversity is a reality, and everyone should respect the differences in each other. Inclusion is a vast concept that implies including everyone in education without being judgmental about the abilities, appearance, and economic condition etc. of the participants.

Need for Inclusive Education

- Builds Self Esteem
- Improves Social and Communication Skills
- Enhances Sensitivity – It has been noted that students without disabilities become more sensitive if they study in a classroom where they have students with special needs.
- Creates Better Understanding and Appreciation of others – In an inclusive classroom, students with or without special needs understand and appreciate the strengths and weaknesses of their classmates.
- Creates a Sense of Belonging
- Enhances Academic Performance
- Improves Performance

Implementation of Inclusive Education in India

In India, the number of children with special needs is really large. As a result, they have a number of problems in getting education, especially inclusive education.

India should emphasize on the following measures for effective implementation of inclusive education.

1. Ensuring effective implementation of the Right to Education in all states so that no child is left out of the scope of education so that we are able to take care of the needs of CWSN.

2. Equipping teachers, especially in rural areas, through appropriate training and in-service workshops to teach CWSN in an inclusive classroom.

3. Developing a support team through regular analysis of school & curriculum.

4. Encouraging a flexible approach towards curriculum transaction whereby teachers and students are able to diagnose and resolve the problems that they face during the teaching learning process.

5. Involving parents as partners and as a resource in the decision-making process for enhancing their child's learning so that a collaborative effort results in effective inclusive education.

6. Designing schools and classes in ways that help children learn and achieve to their fullest potential.

7. Developing education goals according to each child's abilities.

8. Making sincere efforts to develop good relations and understanding between families of students with disabilities and without disabilities. In this way, all students will also develop good relations among themselves and thereby create an appropriate environment for implementing inclusive education.

9. Providing students materials like uniforms, books, stationery, transport allowance, boarding and lodging facilities, therapeutic services, teaching and learning materials, assistive devices, etc., from the school

4.4 ADVANTAGES OF PHYSICAL ACTIVITIES FOR CWSN

Adding physical exercise to the schedules of children with special needs can result in strength improvements, increased stability, improved bone health, and improved stamina and cardiovascular fitness, contrary to popular belief.

PHYSICAL BENEFITS

- ✓ Regular involvement in sports and physical activities: -
- ✓ Helps in developing gross motor & fine motor skills.
- ✓ Improvement in coordination and flexibility
- ✓ Helps to fight back against problem such as obesity.

Technology has launched many video games and other special games for such children. Playing these games affect their strength, coordination, fine motor skills etc. Some of these games are 'Wii Fit Plus' Dance revolution bundle etc

EMOTIONAL HEALTH BENEFITS

- ✓ Physical activity helps in decreasing depression.
- ✓ Regular exercise helps in improving mental health and well-being.
- ✓ Sports activities can also improve general mood and wellness.

MODE OF RECREATION AND FUN - CWSN frequently miss out on social activities, recreation and fun. Participation in extracurricular and sports activities can help them overcome this obstacle, providing them with the ability to engage in social interactions, make friends and initiate social skills.

CHANNELIZING THE SURPLUS ENERGY – Children with disabilities like ADHD display hyperactivity which, if appropriately directed, can bear positive results related to cognitive benefits and constructive behaviour.

PSYCHOLOGICAL BENEFITS

- ✓ Physical activity improves self-esteem, social awareness and self-confidence.
- ✓ Sports activities reduce anxiety, stress and depression
- ✓ Interaction and involvement with other students give children a sense of confidence.

BEHAVIOURAL BENEFITS

- ➢ Sports and games help a child learn to practices self-regulation and enhance their decision-making skills.
- ➢ Child can focus on specific goals and work on their verbal communication by interacting with friends.
- ➢ Sports and P.E teach children a range of skills include teamwork, problem solving abilities, increased attention span, and focus on task-based behaviour.

INCREASED INDEPENDENCE

- ➢ Increase in physical activity can lead to more freedom.
- ➢ Increased physical strength that comes from regular exercise allows persons with disability to do more daily task without assistance

HEALTHY LIFESTYLE

Physically-disabled children often tend to live a sedentary life. As a result of their disability, their levels of participation in sports and physical activity are much lower than their peers. It is imperative that these children, must learn about the steps to lead a healthy life, within the context of their abilities and limitations of their respective conditions.

- ➢ Aids sleep
- ➢ Improves quality of life
- ➢ Strengthens muscles and bones
- ➢ Maintains health & weight
- ➢ Helps prevent chronic disease
- ➢ Builds social skills Improves mobility and balance

4.5 STRATEGIES TO MAKE PHYSICAL ACTIVITIES ACCESSIBLE FOR CWSN

Meaning:

Strategies are planned methods or approaches used to ensure that physical activities are accessible, enjoyable, and beneficial for children with special needs, considering their limitations and abilities.

Participation in physical activity is beneficial for all children, including those with disabilities. In fact, participation of children with disabilities in sports and recreational activities promotes inclusion, optimizes physical functioning, and enhances overall well-being.

Communication – Advance information about activity, space, resource person or any change in activity should be communicated clearly. A variety of different instructional strategies such as verbal, visual and peer teaching should be used for performing various types of physical activities so that children get opportunity to participate in physical activity.

Space – For CWSN, space should be approachable for people having physical disability. The area for the physical activity should be limited. Space for activities should be disturbance free (noise, heat, cold, texture of floor, audience etc.) It is always better to start with indoor space.

Social strategies - A CWSN must be allowed to choose a sport she/he enjoys. It's easier for children to be motivated when they enjoy the activity. At first, the CWSN should be encouraged to watch others. Once the child sees people having fun as they play, she/he will be motivated to participate too.

Psychological strategies –children with disabilities need a lot of motivation to participate in physical activity. It's all about the cycle of conditioning: active kids who stay active grow stronger and more physically literate as they age.

Graded Activities– During initial stage activities should be simple and each activity should be based on a single action. There should be a gradual move from non-locomotor to locomotor to manipulated activities.

KEY STRATEGIES

1. Individualized Instruction Plan (IIP):

- Tailor physical activities based on each child's disability and functional level.
- Consider motor skills, stamina, learning ability, and interests.

2. Use of Adaptive Equipment:

- Equipment like soft balls, sound balls, wheelchairs, and ramps can help CWSN participate easily.
- Equipment must be age-appropriate and disability-friendly.

3. Modification of Rules and Activities:

- Simplify rules, reduce competition pressure.
- Allow extra time, fewer repetitions, or changes in team size.

4. Trained Physical Education Teachers:

- Teachers should be trained in adapted physical education.
- Use multisensory teaching techniques (verbal, visual, tactile).

5. Peer Group Inclusion:

- Encourage cooperative games with peers.
- Assign "peer buddies" for emotional and instructional support.

6. Safe and Accessible Environment:

- Ramps, handrails and smooth playing surfaces should be available.
- Ensure safety, especially for children with mobility challenges.

7. Positive Reinforcement and Motivation:

- Praise and reward every small effort and participation.
- Encourage regular involvement rather than focusing only on performance.

8. Regular Monitoring and Feedback:

- Track progress and modify activities when needed.
- Continuous communication with parents and therapists.

MULTIPLE CHOICE QUESTIONS -1 MARK

1. What does CWSN stand for?

A) Children with Sports Needs B) Children with Special Needs
C) Children with Serious Needs D) Children with Special Nutrition

Answer: B) Children with Special Needs

2. Which of the following is a type of disability?

A) Hearing Impairment B) Visual Impairment
C) Intellectual Disability D) All of the above

Answer: D) All of the above

3. Inclusive education means:

A) Teaching only disabled students
B) Excluding students with disabilities
C) Integrating children with special needs in regular classrooms
D) Special schools for the disabled

Answer: C) Integrating children with special needs in regular classrooms

4. Which law ensures education for all children in India?

A) RTE Act, 2009 B) Disabilities Act, 1995

C) PWD Act, 2016 D) Sports Policy, 2001

Answer: A) RTE Act, 2009

5. Special Olympics are organized for:
A) Athletes under 14 B) Women athletes only
C) Children with special needs D) None of these

Answer: C) Children with special needs

6. Which of the following is not a disability?
A) Dyslexia B) Autism
C) Paralysis D) Asthma

Answer: D) Asthma

7. Which organization is responsible for promoting sports among disabled persons?
A) ICC B) AIFF C) PCI D) IOC

Answer: C) PCI (Paralympic Committee of IndiA)

8. Which is not a component of inclusive education?
A) AcceptanceB) Discrimination C) Collaboration D) Adaptation

Answer: B) Discrimination
9. What is the meaning of the three 'Agitos' in the bellow logo (Paralympic symbol)?
(A) They represent athletes with different disabilities
(B) They represent motion and unity in diversity
(C) They stand for 3 Olympic values
(D) They are for decoration only

Correct Answer: (B) They represent motion and unity in diversity

10. Which of the following aims at empowering persons with disabilities?
A) Khelo India B) PWD Act C) UDAAN Scheme D) RTI Act

Answer: B) PWD Act

11. The term 'inclusive' means:
A) To isolate B) To expel C) To include D) To avoid

Answer: C) To include

12. Cerebral palsy mainly affects:
A) Vision B) Hearing C) Movement and posture D) Heart

Answer: C) Movement and posture

13. Which program helps integrate CWSN into mainstream education?
A) Mid-Day Meal Scheme B) Sarva Shiksha Abhiyan
C) Khelo India D) Fit India Movement

Answer: B) Sarva Shiksha Abhiyan

14. The Paralympics is held after every----
A) 2 years B) 3 years C) 4 years D) 1 year

Answer: C) 4 years
15. Which one of the following is an intellectual disability?
A) Autism B) Polio C) Cerebral palsy D) Blindness

Answer: A) Autism
16. What is the full form of PWD Act?
A) Persons with Disorders Act B) People with Disabilities Act
C) Persons with Disabilities Act D) Public Welfare for Disabled Act
17. Which of the following is a hearing impairment aid?
A) Wheelchair B) Braille C) Hearing Aid D) Crutches
18. Special schools are meant for:
A) Athletes B) General public
C) Children with disabilities D) Teachers

19. Which of the following helps visually impaired individuals to read?
A) Crutches B) Braille
C) Sign language D) Speech therapy

20. Which of these is an example of inclusive practice?
A) Separate sports events for disabled children
B) Avoiding group activities
C) Mainstreaming students with disabilities
D) Denying extra time during exams

VERY SHORT ANSWERS -2 MARKS

1. What is inclusive education?

Ans: Inclusive education is an approach where children with special needs (CWSN) learn together with other students in the same classroom, using necessary support and adaptations to ensure equal learning opportunities.

2. Define disability.

Ans: Disability is any physical, mental, intellectual, or sensory impairment that limits a person's ability to perform activities in a manner considered normal for a human being.

3. What is the main objective of adapted physical education?

Ans: The main objective of adapted physical education is to provide modified physical activities to suit the abilities of CWSN, promoting their physical fitness, motor skills, and social integration.

4. Name two types of physical disabilities.

Ans: Two types of physical disabilities are:

1. Cerebral Palsy

2. Amputation

5. How does physical activity help CWSN?

Ans: Physical activity helps CWSN by improving their physical fitness, motor coordination, social interaction, and self-confidence, while also reducing stress and behavioural issues.

6. What are Special Olympics?

Ans: Special Olympics is an international sports organization that provides training and competition opportunities for individuals with intellectual disabilities, promoting physical fitness and inclusion.

7. Mention two features of inclusive schools.

1. Providing equal learning opportunities to all students including CWSN.
2. Offering necessary support like special educators, assistive devices, and adapted teaching
methods.

8. State any two aims of the PWD Act (1995).

1. To ensure equal opportunities and full participation for persons with disabilities.
2. To remove barriers in education, employment, and accessibility.

9. Differentiate between special and inclusive schools.

Special schools cater exclusively to CWSN and have separate facilities.

Inclusive schools integrate CWSN with other students in a common learning environment.

10. What is the role of a physical education teacher in an inclusive setup?

Ans: A physical education teacher adapts physical activities, provides individualized attention, and fosters a positive environment to encourage participation of CWSN in sports and games.

VERY SHORT ANSWER QUESTIONS 5 UNSOLVED 2-MARKS

1. What are intellectual disabilities? Give examples.

2. How can schools promote inclusion of CWSN in sports?

3. Name any two challenges faced in inclusive education.

4. What is the role of parents in supporting inclusive education?

5. State any two benefits of physical education for visually impaired students

SHORT ANSWER QUESTIONS 3-MARKS

1. Explain any three features of inclusive education.

A) Equal Participation: All students, including CWSN, are given equal opportunities in academics and co-curricular activities.

B) Supportive Environment: Teachers, infrastructure, and curriculum are adapted to support diverse learners.

C) Promotes Social Integration: It encourages interaction and collaboration among all students, fostering mutual respect and understanding.

2. State three objectives of the Special Olympics.

A) To provide year-round training and competition for individuals with intellectual disabilities.

B) To enhance the physical fitness and motor skills of participants.

C) To promote inclusion, confidence and self-esteem through sports.

3. How can physical education teachers support CWSN in sports activities?

A) By modifying games and using adapted equipment suited to individual needs.

B) By encouraging participation through motivation and building self-confidence.

C) By collaborating with special educators and using visual or auditory aids.

4. Describe three ways physical activity benefits children with intellectual disabilities.

A) Improves attention span and learning ability.

B) Develops motor coordination and muscle strength.

C) Promotes social interaction and reduces anxiety or behavioral issues.

5. Differentiate between Special Olympics and Paralympics.

A) Special Olympics is for individuals with intellectual disabilities; Paralympics is for those with physical disabilities.

B) Special Olympics is held every 2 years (winter and summer); Paralympics is held every 4 years after the Olympics.

C) Special Olympics emphasizes participation; Paralympics focuses on elite competition.

6. What are the adaptations that can be made in sports to include children with visual impairments?

A) Use of audio cues and sound-based balls (e.g., in goalball).

B) Involving sighted guides or peer buddies.

C) Ensuring a safe, obstruction-free playing environment.

3 UNSOLVED SHORT ANSWER QUESTIONS

1. What are the challenges faced by teachers in implementing inclusive education for CWSN?

2. State role of the community in promoting inclusive sports.

3. Explain any three provisions under the Persons with Disabilities Act (PWD Act) related to education or sports.

4 SOLVED CASE STUDY QUESTIONS (4 MARKS EACH)

Case Study 1: A Step Toward Inclusion

St. Mary's School recently adopted an inclusive education model. The school modified its infrastructure by adding ramps, handrails, and Braille signboards. The teachers underwent special training to handle children with disabilities. During the annual sports day, events like wheelchair races and standing long jump for visually impaired children were organized.

Q. Answer the following questions:

A) Define inclusive education.

B) Mention two adaptations made by the school.

C) State two benefits of inclusive sports events for CWSN.

D) Name one sports activity suitable for visually impaired children.

Answer:

A) Inclusive education is a system where CWSN are taught with other children in the same environment using appropriate support.

B) Ramps and Braille signboards.

C) Improves confidence and encourages participation; helps in social integration.

D) Standing long jump, blindfold relay, or goalball.

Case Study 2: Overcoming Barriers

Ravi is a student with a mild intellectual disability. He attends a regular school that promotes inclusive education. His teachers use simple language and repeat instructions to help him understand. In physical education classes, Ravi is encouraged to play team games, which help improve his communication and motor skills.

Q. Answer the following questions:

A) What type of disability does Ravi have?

B) How does the teacher support Ravi in class?

C) Name one benefits of physical education for Ravi.

D) Give one example of a suitable team game for such students.

Answer:

A) Intellectual disability.

B) By using simple language and repeating instructions.

C) Improves communication and motor skills.

D) Passing the ball, modified football, or simple relay races.

Case Study 3: Sports for All

An NGO organized a sports festival for children with different disabilities, including cerebral palsy, visual impairment, and hearing loss. Each event was tailored to match the abilities of the participants. Volunteers and peer mentors helped children throughout the activities. The event was praised for its message of "sports for all."

Q. Answer the following questions:

A) Why is it important to modify sports events for CWSN?

B) Mention two roles played by volunteers in such events.

C) Name one suitable sport for children with cerebral palsy.

D) State one benefit of peer mentorship in inclusive events.

Answer:

A) To ensure safety and promote participation without discrimination.

B) Assisting participants, guiding during events.

C) Boccia or seated shot put.

D) Builds confidence and encourages teamwork.

Case Study 4: Role of Schools in Empowerment

Government Model School introduced a weekly program called "Equal Play," focusing on adapted physical education for students with special needs. Activities like yoga, balance games, and stretching are included. The program is supported by special educators and physical education teachers who plan individualized activities for each student.

Q. Answer the following questions:

A) What is adapted physical education?

B) Mention activities suitable for students with physical disabilities.

C) Why is individual planning important in such programs?

D) How do yoga and balance games help students with disabilities?

Answer:

A) Adapted physical education involves modifying activities to suit the needs of CWSN.

B) Yoga and balance games.

C) Because each student has unique needs and abilities.

D) Improves flexibility, body awareness, and coordination.

2 UNSOLVED CASE STUDY QUESTIONS (FOR PRACTICE)

Case Study 5:

Mohan, a boy with visual impairment, studies in a school that practices inclusive education. His teacher uses audio tools and peer buddies to help him during lessons and physical education classes.

Questions:

A) What challenges do visually impaired students face in PE?

B) How can peer buddies support visually impaired students?

C) Name one sport designed for visually impaired individuals.

D) Suggest teaching strategies for such students.

Case Study 6:

Case:

A district sports meet was organized exclusively for children with hearing impairments. Instructions were given through visual cues and signs. The event received strong community support.

Questions:

A) What type of communication barrier do hearing-impaired students face?

B) How can sports events be adapted for hearing-impaired students?

C) Why is community involvement important in such events?

D) Name sports that can be played with visual signaling.

LONG ANSWER QUESTIONS 5-MARKS

Q1. Explain the concept of disability and discuss five types of disabilities.

Ans:

Disability is a condition that limits a person's physical, sensory, cognitive, or emotional functioning. It may affect their ability to perform everyday activities or participate fully in society.

Types of Disabilities:

1. Physical Disability – Impairments that affect mobility, e.g., amputation, cerebral palsy.

2. Visual Impairment – Complete or partial loss of sight.

3. Hearing Impairment – Partial or total inability to hear.

4. Intellectual Disability – Below-average cognitive functioning, e.g., Down syndrome.

5. Learning Disability – Difficulty in reading, writing, or processing information (e.g., dyslexiA).

Q2. Describe the role of schools in promoting inclusive physical education for CWSN.

Ans:

Schools play a critical role in promoting inclusive physical education by:

1. Infrastructure Adaptation: Ramps, accessible playgrounds, and suitable equipment help in physical access.

2. Curriculum Modification: Activities are tailored to meet the abilities of CWSN.

3. Trained Teachers: Educators are trained in adaptive techniques and handling special needs.

4. Peer Support: Inclusive sports encourage cooperation and peer learning.

5. Promoting Positive Attitude: Awareness campaigns and inclusive programs reduce stigma and foster acceptance.

Q3. What is adapted physical education? Explain its need and benefits for children with special needs.

Ans:

Adapted Physical Education (APE) is a modified form of physical education that caters to the needs of children with disabilities. It involves custom activities, tools, and techniques.

Need for APE:

To ensure equal access to fitness and recreation.

To improve physical, mental, and social development.

To build confidence and encourage participation in group activities.

Benefits:

1. Improves motor skills and physical health.

2. Enhances self-esteem and confidence.

3. Encourages socialization with peers.

4. Reduces anxiety and behavioral issues.

5. Helps in emotional and cognitive development.

LONG ANSWER QUESTIONS 5-MARKS UNSOLVED (PRACTICE)

Q1. What is the importance of organizing sports competitions like Special Olympics and Paralympics for CWSN? Discuss with examples.

Q2. Suggest five strategies a physical education teacher can adopt to ensure inclusive participation in PE classes.

IMPORTANT TERMONALOGY

IOC	International Olympic Committee	Lausanne, Switzerland
IOA	Indian Olympic Association	New Delhi, India
IPC	International Paralympics Committee	Bonn, Germany
ICSD	International Committee of Sports for the Deaf	Lausanne, Switzerland
WADA	World Anti-Doping Agency	Montreal, Canada
NADA	National Anti-Doping Agency	New Delhi, India
CWSN	Children with Special Needs	----------
CISS	Le Comité International des Sports Silencieux	1924 at France

UNIT- 5

SPORTS AND NUTRITION

CONTENTS:

1. Concept of balanced diet &nutrition
2. Macro nutrients & micro nutrients: food sources & function
3. Nutritive components of diet & non- nutritive components of diet
4. Eating for weight control -a healthy weight, the pitfalls of dieting, food intolerance and food myths
5. Importance of diet in sports
6. Pre, during, post competition requirements

LEARNING OBJECTIVES :

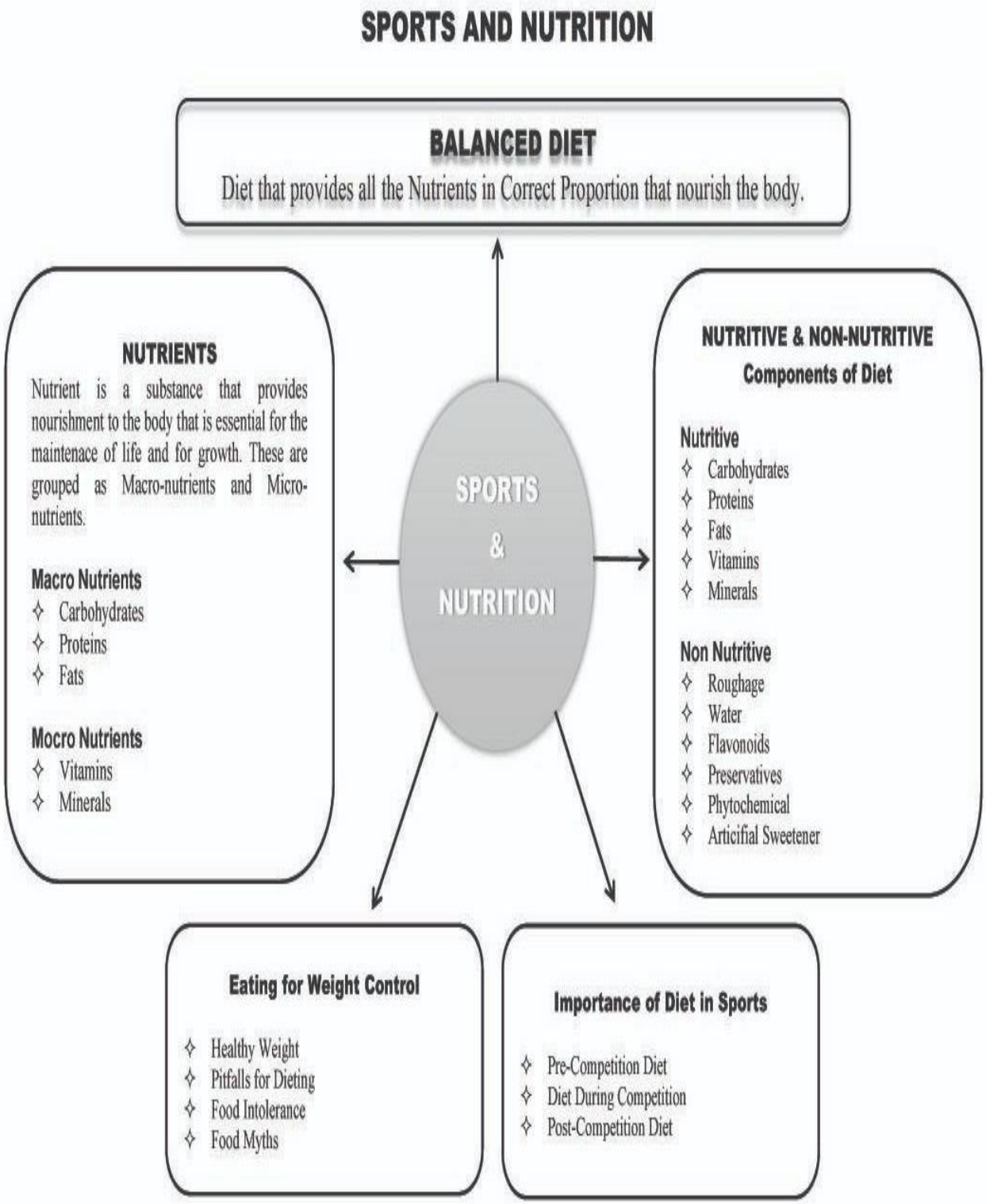
1. Understand the concept and components of a balanced diet for overall health.
2. Explain the role of nutrition in growth, energy production, and disease prevention
3. Differentiate between macronutrients and micronutrients and identify their sources.
4. Analyze the importance of diet and hydration in enhancing sports performance.
5. Recognize the nutritional needs of athletes before, during, and after physical activity..

LEARNING OUTCOMES:

1. Identify the nutritive value of various foods consumed in daily life.
2. Apply knowledge of healthy eating habits to maintain fitness and prevent lifestyle diseases.
3. Understand how food intolerances affect health and how to manage them.
4. Promote the importance of reading food labels and making informed dietary choices.
5. Encourage a healthy relationship with food for both athletic and everyday life purposes.

MIND MAP

MARKS WEIGHTAGE :7 MARKS



5.1 Concept of balanced diet & Nutrition

5.1.1 Balanced Diet

Definition: A balanced diet is a diet that contains different types of foods in the right amounts and proportions to meet the nutritional requirements of the body. It provides adequate energy and all the essential nutrients—carbohydrates, proteins, fats, vitamins, and minerals—for maintaining health, vitality, and well-being.

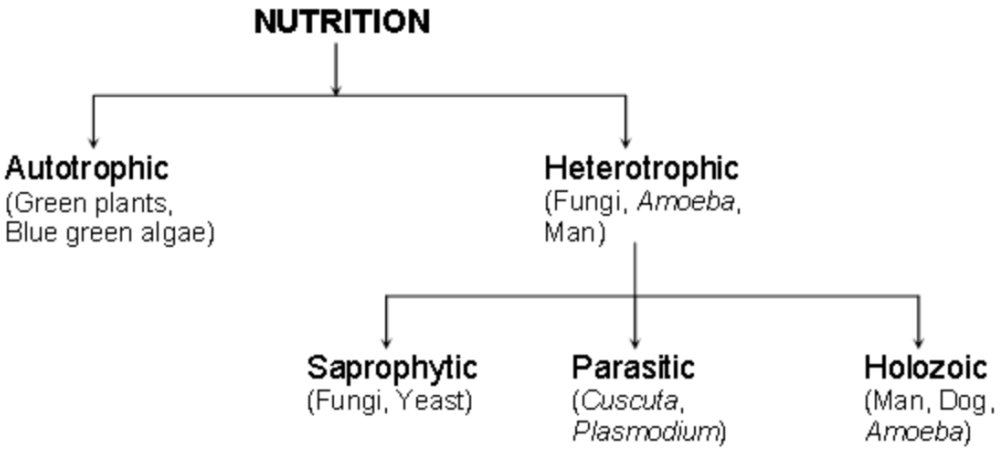
5.1.2 Nutrition

Definition: Nutrition is the scientific study of food and how it affects the body. It involves understanding how the body uses nutrients from food to sustain life and promote growth, development, and overall health

TYPES OF NUTRITION:

Autotrophic Nutrition: Found in plants (e.g., photosynthesis).

Heterotrophic Nutrition: Found in animals and humans (depend on other organisms for fooD).



FUNCTIONS OF NUTRITION IN THE BODY:

- **Energy Production:** Carbohydrates and fats are the main sources.
- **Growth and Development:** Proteins support muscle and tissue growth.
- **Regulation of Body Processes:** Vitamins and minerals support physiological processes like metabolism, nerve function, and immunity.
- **Maintenance and Repair:** Continuous renewal of cells and tissues.

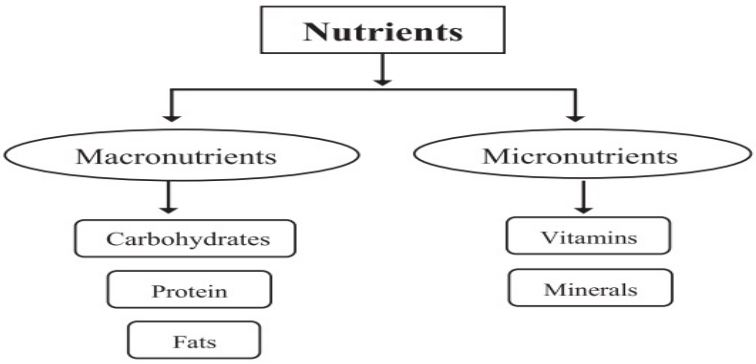
5.2 Nutrients:

Nutrients are substances found in food that your body needs to grow, develop, and stay healthy. They provide energy, help build and repair tissues, and support vital body functions.

Nutrients mainly classified into 2 categories

1.Macro Nutrients

2.Micro Nutrients



1.Macro Nutrients:

Macro nutrients are essential nutrients that your body needs in large quantities to provide energy, maintain bodily functions, and support growth and repair. The term "macro" means large, highlighting the significant amounts of these nutrients required in your diet.

The three main types of macronutrients are:

1. Carbohydrates:

Carbohydrates are the body's primary source of energy. They are broken down into glucose, which fuels your cells, muscles, and especially your brain.

Types:

Simple carbohydrates: Sugars (like those found in fruits, milk, honey, and table sugar) that provide quick energy.

Complex carbohydrates: Starches and fiber (found in whole grains, vegetables, and legumes) that provide a more sustained release of energy due to slower digestion.

Energy content: Approximately 4 calories per gram.

2. Proteins:

Proteins are crucial for building and repairing tissues (muscles, skin, hair, nails, organs), producing enzymes and hormones, and supporting immune function. They are made up of amino acids.

Types:

Complete proteins: Contain all essential amino acids (those your body can't produce) and are typically found in animal products (meat, fish, eggs, dairy).

Incomplete proteins: Lack one or more essential amino acids and are found in most plant-based foods. A combination of different plant proteins can provide all essential amino acids.

Energy content: Approximately 4 calories per gram.

3. Fats (Lipids):

Fats are a concentrated source of energy, provide insulation, protect organs, and are essential for the absorption of fat-soluble vitamins (A, D, E, K). They also play a role in hormone production and cell membrane structure.

Types:

Unsaturated fats: Generally considered "healthy" fats (monounsaturated and polyunsaturated, including omega-3s). Found in avocados, nuts, seeds, and vegetable oils.

Saturated fats: Found primarily in animal products and some plant oils.

Trans fats: Often found in processed foods and should be limited or avoided.

Energy content: Approximately 9 calories per gram (more than double that of carbohydrates and proteins).

2.Micro Nutrients:

Micronutrients are essential nutrients that your body needs in **very small amounts** (hence "micro") to function properly, maintain health, and prevent disease.

Vitamins are essential organic compounds that your body needs in small amounts to function properly. They do not provide energy like carbohydrates or fats, but they help your body use those nutrients efficiently. Each vitamin plays a specific role in maintaining health, such as boosting the immune system, supporting growth and development, and keeping skin, eyes, and nerves healthy.

There are **13 essential vitamins**, and they are divided into two groups:

1. **Fat-soluble vitamins** – Stored in the body's fat and liver.

   Examples: Vitamins A, D, E, and K.

2. **Water-soluble vitamins** – Not stored in the body and must be replenished regularly.

   Examples: Vitamin C and all B-complex vitamins (B1, B2, B3, B6, B12, etc.).

Since the body can't produce most vitamins on its own (except for a few like vitamin D), we must get them through food or supplements. A balanced diet with a variety of fruits, vegetables, grains, and proteins usually provides all the vitamins your body needs.

Fat soluble vitamins:

Vitamin Name (Scientific Name)	Functions & Deficiency Diseases	Sources
Vitamin A (Retinol)	- Helps vision, skin, and immune system - Deficiency: Night blindness, dry skin	Carrots, liver, eggs, leafy greens
Vitamin D (Calciferol)	- Helps absorb calcium for strong bones - Deficiency: Rickets in children, osteomalacia in adults	Sunlight, fish, fortified milk
Vitamin E (Tocopherol)	- Acts as an antioxidant - Deficiency: Nerve and muscle damage	Nuts, seeds, vegetable oils, spinach
Vitamin K (Phylloquinone)	- Helps in blood clotting - Deficiency: Excessive bleeding	Leafy green vegetables, broccoli, liver

Water soluble vitamins:

Vitamin Name (Scientific Name)	Functions & Deficiency Diseases	Sources
Vitamin B1 (Thiamine)	- Helps convert food into energy - Deficiency: Beriberi	Whole grains, pork, nuts, legumes
Vitamin B2 (Riboflavin)	- Supports energy production and skin health - Deficiency: Cracked lips, sore throat	Milk, eggs, leafy greens, almonds
Vitamin B3 (Niacin)	- Supports metabolism and skin health - Deficiency: Pellagra (diarrhoea, dermatitis, dementiA)	Meat, fish, peanuts, whole grains
Vitamin B6 (Pyridoxine)	- Important for brain health and red blood cells - Deficiency: Anaemia, irritability	Bananas, poultry, fish, potatoes
Vitamin B12 (Cobalamin)	- Needed for nerve function and red blood cell formation - Deficiency: Anaemia, nerve damage	Meat, eggs, dairy, fortified cereals
Vitamin C (Ascorbic AciD)	- Boosts immunity, helps in wound healing - Deficiency: Scurvy (bleeding gums, weakness)	Citrus fruits, strawberries, tomatoes

Minerals:

Minerals are natural, inorganic substances that are essential for your body to grow, develop, and stay healthy. Unlike vitamins, which are organic compounds, minerals come from the earth and are absorbed by plants or consumed through animal products.

Minerals play a wide range of roles in the body, such as:

- Building strong bones and teeth
- Supporting muscle function and nerve signals
- Helping the body produce hormones and maintain a healthy heartbeat
- Regulating fluids and energy production

There are two main types of minerals:

1. **Macro minerals (Major minerals)** – Needed in larger amounts

   Examples: **Calcium**, **Potassium**, **Sodium**, **Magnesium**, **Phosphorus**

2. **Trace minerals (Micro minerals)** – Needed in very small amounts

   Examples: **Iron**, **Zinc**, **Iodine**, **Copper**, **Selenium**

MACRO MINERALS:

Mineral Name	Functions & Deficiency Diseases	Sources
Calcium	- Builds strong bones and teeth - Helps muscle contraction and nerve function - Deficiency: Weak bones (osteoporosis), muscle cramps	Milk, cheese, yogurt, leafy greens, tofu
Potassium	- Maintains fluid balance - Supports nerve signals and muscle contractions - Deficiency: Weakness, fatigue, irregular heartbeat	Bananas, oranges, potatoes, spinach, beans
Sodium	- Regulates fluid balance and blood pressure - Helps nerve and muscle function - Deficiency: Rare, but may cause dizziness, confusion	Table salt, processed foods, soups, bread
Magnesium	- Helps in muscle and nerve function - Supports energy production - Deficiency: Muscle cramps, mental disorders, fatigue	Nuts, seeds, whole grains, spinach, dark chocolate
Phosphorus	- Strengthens bones and teeth - Helps in energy production and cell repair - Deficiency: Weak muscles, bone pain	Meat, fish, dairy, eggs, whole grains

MICRO MINERALS

Mineral Name	Functions & Deficiency Diseases	Sources
Iron	Needed for making haemoglobin in red blood cells (carries oxygen) - Deficiency: Anaemia (fatigue, weakness)	Red meat, spinach, beans, lentils, fortified cereals
Zinc	Supports immune function, wound healing, and cell growth - Deficiency: Poor wound healing, hair loss, weakened immunity	Meat, seafood (especially oysters), nuts, whole grains
Iodine	Helps produce thyroid hormones - Deficiency: Goitre (swollen thyroiD), developmental delays	Iodized salt, seafood, dairy products
Copper	Helps with iron absorption and red blood cell formation - Deficiency: Fatigue, anaemia, weak bones	Shellfish, nuts, seeds, whole grains
Selenium	Acts as an antioxidant, protects cells, supports thyroid function - Deficiency: Muscle weakness, heart disease (Keshan disease)	Brazil nuts, seafood, eggs, whole grains

5.3 NUTRATIVE AND NON-NUTRATIVE COMPONENTS OF FOOD

1. Nutritive Components

These are the parts of food that provide nutrients to the body. They help in energy production, growth, and body maintenance.

Main Nutritive Components:

Component	Function
Carbohydrates	Main source of energy
Proteins	Build and repair body tissues
Fats	Provide energy and help absorb vitamins
Vitamins	Support various body functions like immunity and vision
Minerals	Help build bones, make hormones, and regulate heartbeat

2. Non-Nutritive Components

These are substances in food that do not provide nutrition or energy but may affect health positively or negatively.

Examples of Non-Nutritive Components:

Component	Role
Dietary fiber (roughage)	Helps digestion and prevents constipation
Antioxidants	Protect cells from damage
Additives (colors, preservatives)	Improve shelf life or appearance but may cause allergies or health issues in some people
Toxins (natural or artificial)	Harmful if consumed in large amounts (e.g., certain plant toxins, pesticides)
Phytochemicals	Plant compounds that may help prevent diseases
Water	Water helps in digestion, nutrient absorption, temperature regulation, and removal of waste from the body.

Harmful Non-Nutritive Factors:

Harmful non-nutritive factors are substances found in some natural or processed foods that **do not provide any nutritional value** but can be **dangerous or toxic to human health** when consumed in large amounts or without proper preparation.

These substances can:

- ✓ Interfere with nutrient absorption

- ✓ Affect digestion or metabolism
- ✓ Cause allergic reactions or toxicity
- ✓ Lead to long-term health problems if consumed regularly

5.4 Healthy Weight

A **healthy weight** is a body weight that is appropriate for your **height, age, sex, and overall health**. It is the weight at which your body functions best, and it helps reduce the risk of diseases like diabetes, heart disease, and high blood pressure.

Calculating BMI is the best way to determine Healthy weight.

BMI (Body Mass Index)

BMI is the most common tool to assess healthy weight.
It is calculated using your **weight (kg)** divided by your **height (m²)**.

BMI = weight (kg) / height (m²)

5.4.1 BMI Categories:

- ✓ **Underweight:** BMI less than 18.5
- ✓ **Normal (Healthy) weight:** BMI 18.5 – 24.9
- ✓ **Overweight:** BMI 25 – 29.9
- ✓ **Obese:** BMI 30 or more

Example:

A person weighs 60 kilograms and is 1.65 meters tall. Calculate their Body Mass Index (BMI) and determine whether their weight is considered underweight, healthy, overweight, or obese. Explain what the result means in terms of their health.

Solution:

Height = 1.65 meters

Weight = 60 kilograms

BMI = weight (kg) / height (m²)

= 60 kg / 1.65 meters x 1.65 meters

= 22.0

BMI = 22.0

This falls in the "Healthy weight" category (BMI 18.5 – 24.9)

Ways to Maintain a Healthy Body Weight

Maintaining a healthy body weight involves a balance between the calories you consume through food and the calories you burn through physical activity and body functions. Here are some effective ways to achieve and maintain a healthy weight:

1. Eat a Balanced Diet

Include plenty of fruits, vegetables, whole grains, and lean proteins.

Limit sugary drinks, processed foods, and high-fat snacks.

Control portion sizes to avoid overeating.

2. Stay Physically Active

Aim for at least 30 minutes of moderate exercise most days of the week (like walking, cycling, swimming).

Include strength training exercises to build muscle and boost metabolism.

3. Drink Plenty of Water

Water helps control appetite and supports metabolism.

Replace sugary drinks with water whenever possible.

4. Get Enough Sleep

Aim for 7-9 hours of quality sleep per night.

Poor sleep can increase hunger and cravings for unhealthy foods.

5. Manage Stress

Practice relaxation techniques like meditation, yoga, or deep breathing.

Stress can lead to emotional eating and weight gain.

6. Avoid Skipping Meals

Eat regular meals and healthy snacks to maintain steady energy and avoid overeating later.

7. Set Realistic Goals

Aim for gradual weight loss or maintenance, about 0.5 to 1 kg per week.

Celebrate small achievements to stay motivated.

8. Monitor Your Progress

Keep track of your weight, diet, and physical activity.

Adjust habits if you notice weight gain or loss outside your goals.

The Pitfalls of Dieting

1. Yo-Yo Dieting (Weight Cycling)

Losing weight quickly and then gaining it back repeatedly.

Can slow metabolism over time and make future weight loss harder.

2. Nutrient Deficiencies

Extreme or restrictive diets often cut out entire food groups.

This can lead to deficiencies in important nutrients like iron, calcium, or vitamins.

3. Slowed Metabolism

Very low-calorie diets can signal the body to conserve energy.

This slows down metabolism and may result in fatigue and weakness.

4. Loss of Muscle Mass

Without enough protein or exercise, dieting can cause muscle loss instead of fat loss.

Muscle loss can reduce strength and slow metabolism.

5. Mental and Emotional Stress

Strict dieting can lead to food obsession, anxiety, guilt, or depression.

May trigger emotional eating or unhealthy attitudes toward food and body image.

6. Short-Term Results

Fad diets may give quick results but are hard to maintain long term.

Most people regain the weight once they stop the diet.

7. Dehydration

Some diets cause rapid water loss (not fat), especially low-carb diets.

This can lead to dizziness, headaches, and poor concentration.

8. Digestive Problems

Low fibre intake in certain diets can cause constipation.

Sudden dietary changes can upset your digestive system.

FOOD INTOLERANCE:

Food intolerance refers to difficulty digesting certain foods and having an unpleasant physical reaction to them. Unlike a **food allergy**, which involves the immune system, food intolerance is typically a digestive system response. It does **not** cause life-threatening reactions but can significantly affect quality of life.

Cause:

Enzyme deficiency – e.g. lactase (lactose intolerance)

Chemical sensitivity – e.g. histamine, salicylates

Food additives – e.g. MSG, sulfites

FODMAP intolerance – poor absorption of certain carbs

Irritable Bowel Syndrome (IBS) – food triggers symptoms

Caffeine or natural food chemicals – overreaction to stimulants

Spoiled or toxic food – bacteria or toxins cause symptoms

Genetics – inherited enzyme issues (like fructose intolerance)

symptoms of food intolerance:

1. People often experience bloating after eating the problem food.

2. Excessive gas is a common sign of poor digestion.

3. Abdominal pain or cramps may occur a few hours after eating.

4. Some individuals develop diarrhoea or constipation.

5. Nausea can arise shortly after consuming the trigger food.

6. Headaches or migraines may follow food intolerance in sensitive individuals.

7. Many people report feeling fatigued or low on energy.

8. Brain fog, or difficulty concentrating, is another possible symptom.

9. In some cases, food intolerance can cause mild skin rashes or irritation.

FOOD MYTHS

1. Myth: Fat is always bad for health

Truth: The body needs healthy fats (like omega-3, unsaturated fats) for energy, hormone production, and brain function.

Sources: Nuts, seeds, olive oil, fish.

2. Myth: Skipping meals helps in losing weight

Truth: Skipping meals can slow down metabolism and lead to overeating later. It reduces energy and focus, especially for athletes.

3. Myth: Only proteins build muscles

Truth: Carbohydrates provide the energy needed for workouts, and proteins help in repair and growth. Both are essential.

4. Myth: All carbohydrates are bad

Truth: Complex carbs like whole grains, fruits, and vegetables are necessary for energy. Only refined sugars should be avoided.

5. Myth: Drinking water during exercise causes cramps

Truth: Staying hydrated prevents cramps. Lack of water and electrolytes is the real reason for muscle cramps.

6. Myth: Natural/organic food has no calories

Truth: Natural foods still have calories. Eating too much, even of healthy food, can lead to weight gain.

7. Myth: Supplements are essential for athletes

Truth: A balanced diet is usually enough. Supplements should only be taken on the advice of a doctor or dietician.

8. Myth: Eating late at night leads to fat gain

Truth: It's not about when you eat, but how much and what you eat. Total calorie intake and activity matter more.

9. Myth: More protein = more strength

Truth: Excess protein is not stored as muscle—it's either used for energy or stored as fat. Balanced intake is the key.

10. Myth: Detox diets cleanse your body

Truth: The liver and kidneys already detox the body. Detox diets are often unnecessary and sometimes unsafe.

5.5 - IMPORTANCE OF DIET IN SPORTS

Focus: Pre, During & Post Sports Competition Diet

1. Pre-Competition Diet (Before Sports)

Objective: To provide energy, keep the stomach light, and prevent fatigue during performance.

Required Diet :

a. High Carbohydrates:

Carbs are the main energy source.

Include foods like rice, pasta, oats, bananas, bread.

b. Moderate Protein:

Helps maintain muscle strength.

Eggs, milk, nuts, paneer in moderate quantity.

c. Low Fat & Fiber: Fatty and high-fiber foods slow digestion and may cause discomfort.

d. Well-timed Meal (3–4 hours before):

Large meal 3–4 hours before competition.

Light snack 30–60 minutes before (e.g., banana, energy bar).

e. Hydration:

Drink sufficient water before the event.

Avoid carbonated or caffeinated drinks.

2. Diet During Competition (In Between or Long-duration Events)

Objective: To maintain energy and hydration during play.

Required Diet :

a. Easily Digestible Carbohydrates: Sports drinks, glucose water, fruits like oranges or bananas.

b. Avoid Solid Food: Difficult to digest during high activity.

c. Electrolyte Replacement: Use drinks with sodium, potassium to replace sweat loss.

d. Small Frequent Intake: Small sips of water or drinks every 15–20 minutes during breaks.

e. Personalized Plan: Endurance athletes (marathoners, cyclists) may need energy gels, bars.

3. Post-Competition Diet (After Sports)

Objective: To recover energy, repair muscles, and rehydrate body.

Required Diet :

a. **High Carbohydrates:** Replenish glycogen stores lost during activity.

b. **High Protein:** Repairs muscle tissues and aids recovery.

Include eggs, milk, lean meat, pulses.

c. **Rehydration:** Drink plenty of water or ORS (Oral Rehydration Solution) with electrolytes.

d. **Balanced Meal within 30–60 Minutes:** Ideal time for recovery meal/snack post-event.

e. **Antioxidant-rich Foods:** Helps reduce inflammation (e.g., berries, turmeric milk, green leafy veggies).

SUMMARY TABLE

Time	Focus	Foods
Pre	Energy & Digestion	Carbs, light proteins, low-fat foods
During	Hydration & Quick Energy	Water, glucose, electrolyte drinks, fruits
Post	Recovery & Rehydration	Carbs, proteins, fluids, antioxidants

QUESTIONS AND ANSWERS

Solved Multiple Choice Questions 1 Mark

1. What is the main source of energy for athletes?
A) Protein B) Carbohydrates C) Vitamins D) Minerals
Answer: B) Carbohydrates

2. Which nutrient is primarily responsible for muscle repair?
A) Fats B) Carbohydrates C) Proteins D) Water
Answer: C) Proteins

3. Which one is a micronutrient?
A) Protein B) Fat C) Vitamin C D) Carbohydrate
Answer: C) Vitamin C

4. What is the function of fiber in the diet?
A) Provides energy B) Builds muscle C) Aids digestion D) Improves bone strength
Answer: C) Aids digestion

5. Which of the following is an example of a food rich in fats?
A) Apple B) Olive oil C) Rice D) Lentils
Answer: B) Olive oil

6. What percentage of an athlete's diet should consist of carbohydrates?
A) 10–15% B) 20–30% C) 40–45% D) 55–60%

Answer: D) 55–60%

7. Which is vitamin that is water-soluble?
A) Vitamin A B) Vitamin D C) Vitamin C D) Vitamin E
Answer: C) Vitamin C

8. What is the primary role of iron in the body?
A) Boosts immunity B) Strengthens bones
C) Helps in oxygen transport D) Supports vision
Answer: C) Helps in oxygen transport

9. Which is the food that is most suitable after a sports activity for muscle recovery?
A) Chocolate B) Banana C) Chicken D) Soft drink
Answer: C) Chicken

10. What is the main cause of lactose intolerance?
A) Allergy to milk protein B) Lack of lactase enzyme
C) Excessive calcium D) Overeating dairy products
Answer: B) Lack of lactase enzyme

11. Which is the mineral essential for bone health?
A) Zinc B) Calcium C) Iron D) Sodium
Answer: B) Calcium

12. Which of the following is a function of water in the body?
A) Builds muscle B) Provides calories
C) Regulates body temperature D) Builds bones
Answer: C) Regulates body temperature

13. A balanced diet includes:
A) Only plant-based foods B) Equal portions of carbohydrates and fats only
C) All nutrients in proper proportions D) Only protein-rich foods
Answer: C) All nutrients in proper proportions

14. Which of the following is a sign of food intolerance?
A) Fever B) Hives C) Sneezing D) Bloating
Answer: D) Bloating

15. What is the most essential nutrient for hydration in athletes?
A) Protein B) Calcium C) Water D) Fat
Answer: C) Water

UNSOLVED MULTIPLE-CHOICE QUESTIONS (FOR PRACTICE):

16. Which is the nutrient that helps in the absorption of fat-soluble vitamins?
A) Water B) Carbohydrates C) Fats D) Proteins

17. Which of the following is a good source of protein for vegetarians?
A) Chicken B) Eggs C) Lentils D) Fish

18. Which is the vitamin that is produced in the body with sunlight exposure?
A) Vitamin A B) Vitamin B12 C) Vitamin D D) Vitamin K

19. What should athletes consume during long-duration sports events?
A) Fats B) Fiber C) Energy drinks or glucose D) Cheese

20. Which is the food suitable for someone with gluten intolerance?
A) Wheat bread B) Pasta C) Rice D) Barley

SOLVED VERY SHORT ANSWER QUESTIONS (2 MARKS)

1. What is a balanced diet?
Answer: A balanced diet includes all essential nutrients in proper proportions for good health.

2. Name one energy-giving nutrient.
Answer: Carbohydrates.

3. Which nutrient is essential for muscle repair?
Answer: Protein.

4. What is the main function of vitamins in the body?
Answer: They help regulate body functions and boost immunity.

5. Give one example of a macronutrient.
Answer: Fat.

6. Name a food rich in calcium.
Answer: Milk.

7. What is food intolerance?
Answer: It is the inability to digest certain foods properly.

8. Which mineral is necessary for oxygen transport in the blood?
Answer: Iron.

9. What is the percentage of water in the human body?
Answer: About 60–70%.

10. What should athletes consume after exercise for recovery?
Answer: Protein-rich foods like eggs or lean meat.

UNSOLVED VERY SHORT ANSWER QUESTIONS

11. What is the function of dietary fiber?
Answer: _____

12. Name a vitamin that is fat-soluble.
Answer: _____

13. What is the role of water in the body?
Answer: _____

14. Name the nutrient that is the body's main source of energy during exercises?
Answer: _____

15. Name one symptom of lactose intolerance.
Answer: _____

SOLVED SHORT ANSWER QUESTIONS (3 MARKS)

1. What is the importance of a balanced diet in sports?
Answer: A balanced diet provides the necessary energy, supports muscle repair, enhances performance, prevents injuries, and speeds up recovery for athletes.

2. Differentiate between macronutrients and micronutrients.
Answer: Macronutrients (carbohydrates, proteins, fats) are required in large amounts and provide energy. Micronutrients (vitamins and minerals) are needed in smaller amounts and support body functions like immunity and bone health.

3. How does hydration affect sports performance?
Answer: Proper hydration maintains body temperature, improves endurance, prevents cramps, and supports concentration and muscle function during physical activity.

4. What are the causes and symptoms of food intolerance?
Answer: Food intolerance occurs due to the inability to digest certain food components like lactose or gluten. Symptoms include bloating, gas, stomach cramps, and diarrhea.

5. What is the role of proteins in an athlete's diet?
Answer: Proteins help build and repair muscles, support recovery after exercise, and are essential for the maintenance of body tissues.

6. List any three components of a nutritive diet and give one example of each.
Answer:

Carbohydrates – Rice

Proteins – Eggs

Fats – Nuts

UNSOLVED SHORT ANSWER QUESTIONS 3 MARKS

7. Explain any two functions of vitamins in the human body.
Answer: _____

8. What are the dietary precautions that should be taken by someone with gluten intolerance?
Answer: _____

9. Mention three healthy eating habits that promote long-term health.
Answer: _____

SOLVED CASE-BASED QUESTIONS (4 MARKS)

Case 1:

Rahul is a national-level swimmer who practices for 3 hours daily. His coach advised him to increase his intake of carbohydrates and proteins. Rahul also noticed that when he skips meals or doesn't hydrate properly, he feels tired and dizzy during training.

Q1. Why did Rahul's coach advise him to consume more carbohydrates and proteins?
A) To improve sleep quality B) To boost flexibility
C) For energy and muscle recovery D) To improve height
Answer: C) For energy and muscle recovery

Q2. What is the role of carbohydrates for an athlete?
A) Builds bones B) Provides long-lasting energy
C) Helps in joint movement D) Improves balance
Answer: B) Provides long-lasting energy

Q3. What happens if an athlete is dehydrated during training?
A) Improved focus B) Muscle growth
C) Tiredness and dizziness D) Better stamina
Answer: C) Tiredness and dizziness

Q4. Which of the following helps in muscle repair?
A) Carbohydrates B) Proteins
C) Fats D) Vitamins
Answer: B) Proteins

Case 2:

Meena is a 16-year-old athlete who recently started experiencing bloating and stomach cramps after drinking milk. Her doctor diagnosed her with lactose intolerance.

Q1. What is lactose intolerance?
A) Allergy to nuts B) Inability to digest gluten
C) Inability to digest milk sugar D) Deficiency of protein
Answer: C) Inability to digest milk sugar

Q2. Which of the following is a symptom of lactose intolerance?
A) Strong bone B) Clear skin
C) Stomach cramps after drinking milk D) Increased appetite
Answer: C) Stomach cramps after drinking milk

Q3. Which is a suitable calcium-rich alternative for lactose-intolerant people?
A) Chees B) Butter C) Almonds D) Ice cream
Answer: C) Almonds

Q4. Which vitamin helps absorb calcium effectively?
A) Vitamin A B) Vitamin D C) Vitamin C D) Vitamin K
Answer: B) Vitamin D

Case 3:

Karan is preparing for a marathon. He eats balanced meals but often eats fried snacks and skips post-training recovery meals. His performance is declining.

Q1. What is the major drawback of regularly eating fried snacks?
A) Boosts energy B) Helps build muscles
C) Adds unhealthy fats D) Improves digestion
Answer: C) Adds unhealthy fats

Q2. What is the function of a post-training meal?
A) Helps in improving memory
B) Helps in muscle recovery and energy replenishment
C) Helps with eyesight
D) Enhances height
Answer: B) Helps in muscle recovery and energy replenishment

Q3. What is the main nutrient required for recovery after training?
A) Protein B) Water C) Fibre D) Fat
Answer: A) Protein

Q4. Skipping recovery meals can result in:
A) Fast recovery B) Muscle fatigue and slower performance

C) Increased flexibility D) Better sleep
Answer: B) Muscle fatigue and slower performance

Case 4:

A group of school athletes underwent a diet assessment. It was found they were not consuming enough iron and vitamin C. Some of them complained of tiredness and frequent illness.

Q1. Why is iron important for athletes?
A) Increases height B) Helps oxygen transport in blood
C) Improves skin tone D) Boosts eyesight
Answer: B) Helps oxygen transport in blood

Q2. A sign of iron deficiency is:
A) Increased strength B) Strong bones
C) Fatigue and tiredness D) High blood pressure
Answer: C) Fatigue and tiredness

Q3. What role does vitamin C play in the body?
A) Builds fat B) Strengthens immunity and helps absorb iron
C) Weakens digestion D) Increases blood sugar
Answer: B) Strengthens immunity and helps absorb iron

Q4. Which of these foods is rich in iron?
A) Apples B) Spinach C) Milk D) Rice
Answer: B) Spinach

UNSOLVED CASE-BASED QUESTIONS

Case 5:

Sneha, a state-level basketball player, avoids eating before matches thinking it will keep her be light and fast. However, she often feels weak midway through the game.

1.What is a common effect of skipping meals before intense physical activity?
A) Improved speed B) Increased focus
C) Fatigue and weakness D) Enhanced stamina

2. Which of the following should be avoided right before a match?
A) Complex carbohydrates B) Water
C) Sugary and fried food D) Bananas

3.What type of nutrients should a pre-match meal mainly consist of?
A) Fats and salt B) Proteins and complex carbohydrates
C) High sugar snacks D) Processed foods

4. Why is it important for athletes to fuel up before a game?
A) To avoid dehydration only B) To stay full during the match
C) To maintain energy levels and performance D) To gain muscle immediately

Case 6:

A school conducted a workshop on healthy eating habits. Students were asked to track their daily intake and noticed many were consuming sugary drinks and processed foods.

1. What can be a long-term result of consuming sugary drinks daily?
A) Increased strength B) Obesity and tooth decay
C) Height growth D) Better digestion

2.Which of the following is a healthy alternative to chips and candies?
A) Soft drinks B) Fried samosa
C) Fruits and nuts D) Chocolates

3.Why are processed snacks considered unhealthy?
A) They contain fresh ingredients B) They are low in calories
C) They are high in sugar, salt, and unhealthy fats D) They improve heart health

4.What should be the goal of tracking one's daily food intake?
A) To eat less food B) To focus only on calories
C) To balance nutrients and develop healthy habits D) To avoid home-cooked meals

SOLVED LONG ANSWER QUESTIONS (5 MARKS)

1. Explain the importance of a balanced diet for sportspersons. List the components of a balanced diet and their roles.

Answer:

A balanced diet is a diet that includes all essential nutrients — carbohydrates, proteins, fats, vitamins, minerals, fiber, and water — in the right proportions to support healthy body functioning. For sportspersons, a balanced diet is critical because it fuels their workouts, aids recovery, and improves performance.

Importance of a Balanced Diet for Sportspersons:

Energy Supply: Athletes require more energy to sustain long hours of physical training. A balanced diet ensures sufficient calorie intake for energy and endurance.

Tissue Growth and Repair: Protein and certain micronutrients help in repairing muscle tissue damaged during strenuous activity.

Enhanced Immune Function: A healthy immune system protects athletes from frequent infections and illnesses.
Improved Focus and Concentration: Proper nutrition supports brain function, helping in better decision-making and coordination during sports.

Faster Recovery: Nutrients like proteins, antioxidants, and omega-3 fats help reduce inflammation and speed up recovery.

Components of a Balanced Diet and Their Roles:

Carbohydrates:

Primary source of energy.

Found in: rice, bread, pasta, fruits.

Proteins:

Required for muscle building and repair.

Found in: eggs, lean meat, dairy, legumes.

Fats:

Provide long-term energy, support cell structure, and aid in nutrient absorption.

Found in: nuts, oils, seeds, avocados.

Vitamins:

Regulate body functions and strengthen immunity.

Found in: fruits, vegetables, dairy.

Minerals:

Essential for bone health, nerve function, and blood oxygenation (e.g., calcium, iron).
Found in: green leafy vegetables, dairy, nuts.

Fiber:

Aids digestion and keeps the gut healthy.

Found in: whole grains, fruits, and vegetables.

Water:

Maintains hydration, regulates temperature, and helps transport nutrients.

Conclusion:
For athletes, eating a balanced diet is not just about staying healthy; it's a key factor that determines performance, stamina, and recovery. The right mix of nutrients can give a competitive edge.

2. Differentiate between macronutrients and micronutrients. Explain their importance in an athlete's diet with examples.

Answer:

Nutrients are substances that the body needs to function properly. They are broadly classified into macronutrients and micronutrients, based on the quantity required by the body.

Macronutrients:

Definition: Nutrients needed in large amounts.
Types: Carbohydrates, proteins, and fats.
Functions:

Carbohydrates: Main source of energy. Athletes rely on carbs for sustained energy (e.g., bread, fruits, pastA).
Proteins: Essential for muscle repair and growth (e.g., eggs, chicken, tofu).
Fats: Provide backup energy, protect organs, and aid hormone production (e.g., nuts, oil, dairy).
Micronutrients:

Definition: Nutrients required in small amounts but vital for health.
Types: Vitamins and minerals.
Functions:
Vitamins: Help in metabolic processes. For instance, Vitamin C strengthens immunity; Vitamin D supports bone health.
Minerals: Support body functions such as oxygen transport (iron) and nerve signaling (calcium, potassium).
Importance in an Athlete's Diet:

Macronutrients are critical for energy production, endurance, muscle development, and overall physical output.

Micronutrients ensure proper cellular function, quicker recovery, and disease prevention.
Example:
An athlete might eat pasta (carbohydrate) before a game for energy, drink milk (calcium) for bone health, and consume fruits (vitamins) to stay immune-strong.

Conclusion:
Both macronutrients and micronutrients are essential for athletes. While macros provide fuel and structural support, micros ensure that the body systems run smoothly for maximum performance.

3. What is food intolerance? How is it different from food allergy? Mention common types, symptoms, and dietary adjustments.

Answer:

Food intolerance is a digestive system response in which the body has difficulty digesting certain foods. It is generally less severe than a food allergy and does not involve the immune system.

Difference Between Food Intolerance and Allergy:

Aspect	Food Intolerance	Food Allergy
System Involved	Digestive system	Immune system
Reaction Time	Gradual (hours after eating)	Immediate (within minutes)
Severity	Mild to moderate	Can be severe or life-threatening
Common Symptoms	Bloating, gas, cramps	Hives, swelling, breathing difficulty

Common Types of Food Intolerance:

Lactose Intolerance:
Caused by deficiency of lactase enzyme; person cannot digest milk sugar.

Gluten Sensitivity:
Causes bloating, discomfort after eating wheat products (non-celiaC).

Fructose Intolerance:
Reaction to fruits or foods high in fructose sugar.

Symptoms:
Bloating
Diarrhea
Stomach cramps
Gas
Nausea
Dietary Adjustments:
Avoid trigger foods (e.g., dairy for lactose intolerance).
Use alternatives (e.g., almond milk, gluten-free grains).
Read food labels carefully.

UNSOLVED LONG ANSWER QUESTIONS

4. Describe the role of nutrition in maintaining physical fitness. How does poor nutrition affect athletic performance?

Answer: _____

5. Discuss the significance of hydration before, during, and after sports activities. What are the consequences of dehydration in athletes?

Answer: _____

UNIT- VI
TEST AND MEASUREMENT IN SPORTS

CONTENT:

TEST AND MEASUREMENT IN SPORTS

i. Fitness Test – SAI Khelo India Fitness Test in school
ii. Measurement of Cardio-Vascular Fitness – HARVARD Step Test
iii. Computing Basal Metabolic Rate (BMR)
iv. Rikli & Jones - Senior Citizen Fitness Test
v. Johnsen – Methney Test of Motor Educability

LEARNING OBJECTIVES

- Understand the concept and importance of test and measurement in sports and physical education.
- Gain the ability to design and conduct fitness assessments based on scientific protocols.
- Learn to collect, analyze, and interpret data for athlete performance enhancement.
- Develop skills to evaluate different fitness components such as strength, endurance, flexibility, and agility.
- Apply test results to plan and improve training programs effectively.
- Explore career opportunities in sports science and allied health fields.
- Enhance knowledge of performance tracking techniques using standard testing procedures.

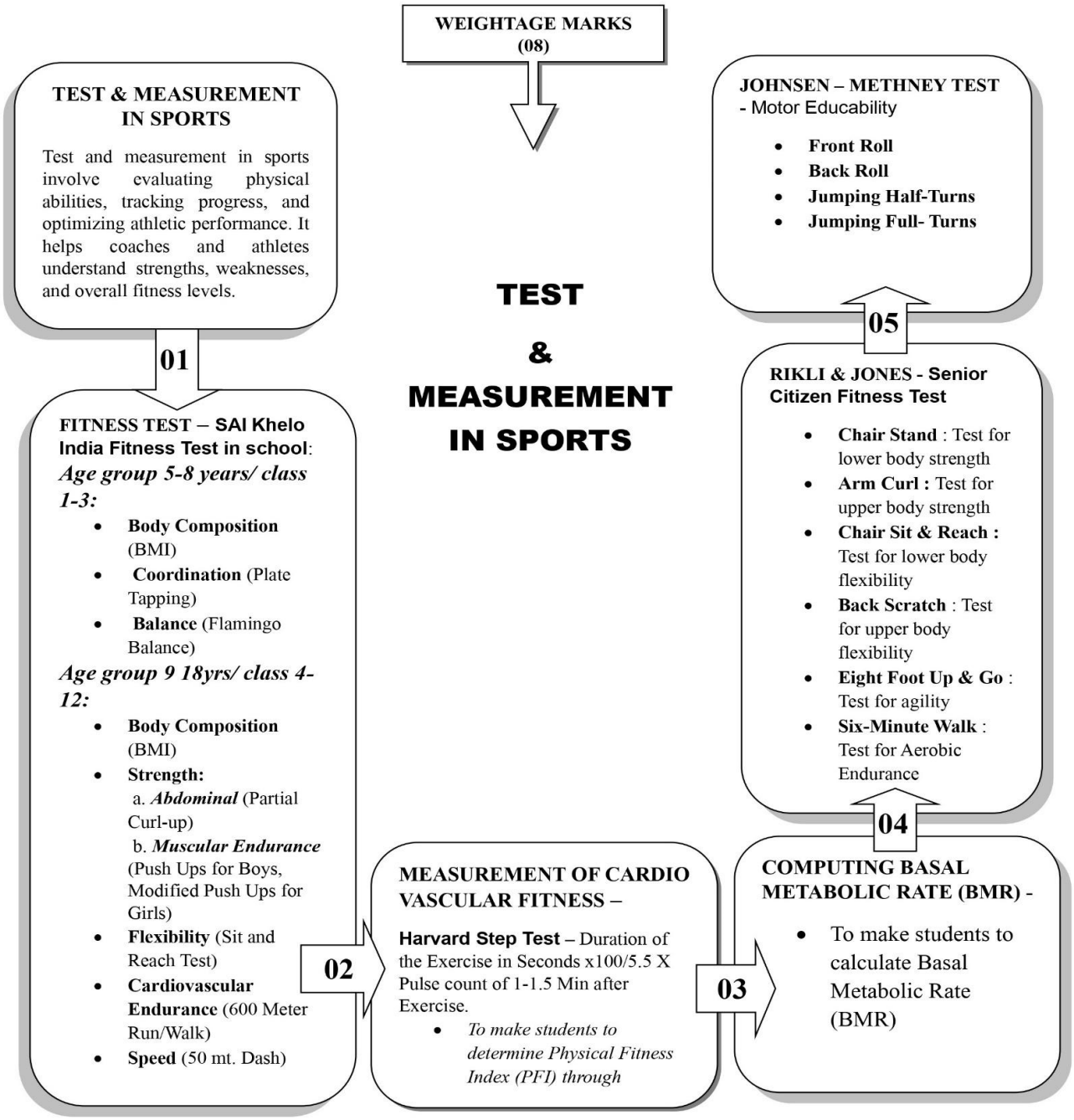
LEARNING OUTCOMES

- Ability to assess fitness using standard protocols.
- Evaluate and interpret physical performance data accurately.
- Identify strengths and weaknesses of athletes.
- Use test outcomes to improve athletic training.
- Explore professional opportunities in sports science and education.

Test and measurement in sports help assess an individual's physical fitness, strengths, and weaknesses. It includes different types of tests like flexibility, strength, endurance, and agility tests, including the HARVARD Step Test and Senior Citizen Fitness Test. BMR (Basal Metabolic Rate) helps in understanding energy needs and planning one's diet for weight management. Data collected from tests is used to improve training and performance. This knowledge also supports careers like fitness trainer, sports scientist, and analyst.

UNIT - 6

MIND MAP



FITNESS TEST – SAI KHELO INDIA FITNESS TEST IN SCHOOL

Launched by the **Sports Authority of India (SAI) under the Khelo India Programme in 2018,** this test promotes fitness awareness in school children. It measures strength, speed, flexibility, endurance, and BMI. Includes 50m sprint, bent arm hang, and agility tests. It helps track student fitness progress nationally.

AGE GROUP 5-8 YRS./ CLASS 1-3:

- BMI : To assess Body Composition
- Flamingo Balance Test: To assess Balancing ability
- Plate Tapping Test : To assess neuro muscular Coordination

BODY COMPOSITION: BODY MASS INDEX (BMI)

Definition: BMI is a method used to assess whether a person has a healthy body weight for their height.
Equipment Required: Flat, Clean surface, Weighing Machine, Stadiometer/Measuring Tape pasted on a wall Procedure:
Measuring Height: The measurement need to be taken while the participant stands with head, shoulders, buttocks, and heels touching the flat surface.

Measuring Weight*:* The participants are asked to remove shoes and heavy clothing, such as sweaters. Then they are asked to stand with both feet in the centre of the scale and to look straight.

Formula:

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

Example:

A student weighs **60 kg** and is **1.65 meters** tall.

$$\text{BMI} = \frac{60}{1.65^2} = \frac{60}{2.7225} \approx 22.04$$

→ This student has a **normal BMI**.

FLAMINGO BALANCE TEST

Equipment Required: Non-slippery even surface, Stopwatch, can be done while standing on beam.

Purpose: To assess static balance, which is the ability to maintain the body in a fixed position without swaying or falling.

Procedure:

1. The student stands on the beam on one leg (e.g., right leg), bending the free leg at the knee and holding the foot close to the buttocks with the same-side hand.
2. The student starts balancing as soon as the stopwatch starts.
3. Every time the student loses balance (touches the floor, lets go of foot, or falls off the beam), it counts as one fault.
4. The total number of faults in 30 seconds is recorded.
5. The test can be repeated twice, and the best score is taken.

Scoring:

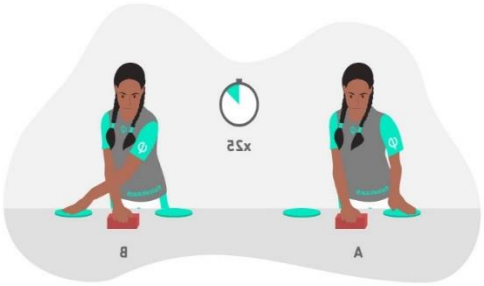
- The total number of falls or loss of balance in 60 seconds of balancing is recorded. If there are more than 15 falls in the first 30 seconds, the test is terminated.
- **Lower number of faults = better balance**
- For example:
  3 faults in 30 seconds → Good balance
  10 faults → Poor balance

PLATE TAPPING TEST

Purpose: To measure upper body reaction time, speed, and coordination of hand movement.

Equipment Needed:

- A table
- Two plastic plates (or discs) – placed 60 cm apart
- A rectangle (20 cm × 10 cm) marked in the center between the plates
- Stopwatch



Procedure:

1. 1.The student stands in front of the table.
2. 2.Place the non-dominant hand (left hand for right-handed person) on the rectangle and keep it there.
3. 3.When told to start, the student uses the dominant hand (right hanD) to touch each plate alternately as fast as possible.
4. 4.The student must tap each plate 25 times (making 50 taps total).
5. 5.The stopwatch is started at the first tap and stopped after the 50th tap.

Scoring:

- The total time taken to complete 50 taps is recorded in seconds.

- **Less time = better coordination and speed**

AGE GROUP 9- 18YRS/ CLASS 4-12:

BMI

(Same as described in the test of Age group 5-8 yrs./ Class 1-3)

50M SPEED TEST

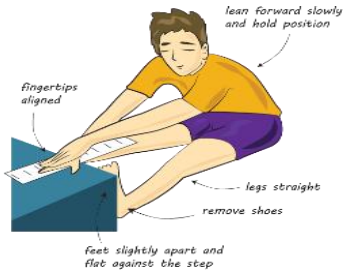
Purpose: To assess the component of Speed
Procedure & Scoring: The individual runs a distance of 50 m with full speed and the time to cover this distance is recorded in seconds and milliseconds.

600MT RUN/WALK

Purpose: To assess Cardio-vascular endurance
Procedure & Scoring: The individual runs/walk a distance of 600 m and the time to cover this distance is recorded in minutes and seconds.

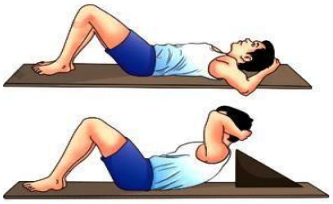
SIT & REACH FLEXIBILITY TEST

Purpose: To assess Flexibility
Procedure & Scoring: The individual sits in flat surface with the feet touching flat to the sit and reach box. He/she needs to extend the arm and bend forward to touch the measuring scale in the upper surface of the box, while keeping the knees straight. The distance is recorded in centimeters



ABDOMINAL PARTIAL CURL UP

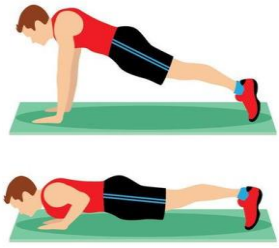
Purpose: To assess Muscular Endurance
Procedure & Scoring: The individual lie on a flat surface with palm touching downward by the side of the body.
He/she then raise body and slide the hand forward to the distance of 6" and moves back. Number of correct repetitions is recorded for 30 sec.



PUSH-UPS (FOR BOYS)

Purpose: To assess Muscular Strength

Procedure & Scoring: The individual lie on proline position with arm extended with palm by the side of the shoulder and the ankle, hip and shoulder in the same line. He/ She flexes the arm



to move down and comes back to the initial position. The number of correct repetitions in 1 minute is recorded.

MODIFIED PUSH-UPS (FOR GIRLS)

Purpose: To assess Muscular Strength
Procedure & Scoring: Same as push up with knees touching the ground.

MEASUREMENT OF CARDIO-VASCULAR FITNESS – HARVARD STEP TEST

Developed by Belgian-American physiologist Lucien Brouha and his associates in 1943 at the HARVARD Fatigue Laboratories during World War II.

Objective: To measure cardio vascular efficiency, Aerobic Fitness and Recovery rate.

Equipment: Stopwatch, a platform 20 inches high (men), 18 inches for women**.**

Procedure: The participant is asked to step-up on the platform and down again at a rate of 30 steps/minute for 5 minutes continuously or until he gets exhausted.

Scoring: As soon as the participant completes the cycle, he is asked to sit-down and the total number of heartbeats are counted between 1 to 1.5 minutes, 2 to 2.5 minutes and 3 to 3.5 minutes. The score is based on following formula:

LONG FORM:

Procedure:

1. The subject steps up and down on a bench or platform (height: 20 inches for men, 16 inches for women) at a rate of **30 steps per minute**.
2. The stepping continues for a **maximum of 5 minutes (or 150 steps)** or until exhaustion.
3. After stopping, the subject sits down, and **pulse is recorded** at:

   - 1 to 1.5 minutes after exercise (Pulse1)
   - 2 to 2.5 minutes (Pulse2)
   - 3 to 3.5 minutes (Pulse3)

Scoring Formula:
Fitness Index (FI) = Duration of Exercise in Seconds×100÷(Pulse1+Pulse2+Pulse3)×2

Interpretation of Score:

- Above 90 = Excellent
- 80–89 = Good
- 65–79 = Average
- Below 65 = Poor

SHORT FORM

Test Name: Harvard Step Test

Purpose: To assess cardiovascular fitness

Duration: 5 minutes or until exhaustion

Step Height: 20 inches (men), 16 inches (women)

Step Rate: 30 steps per minute

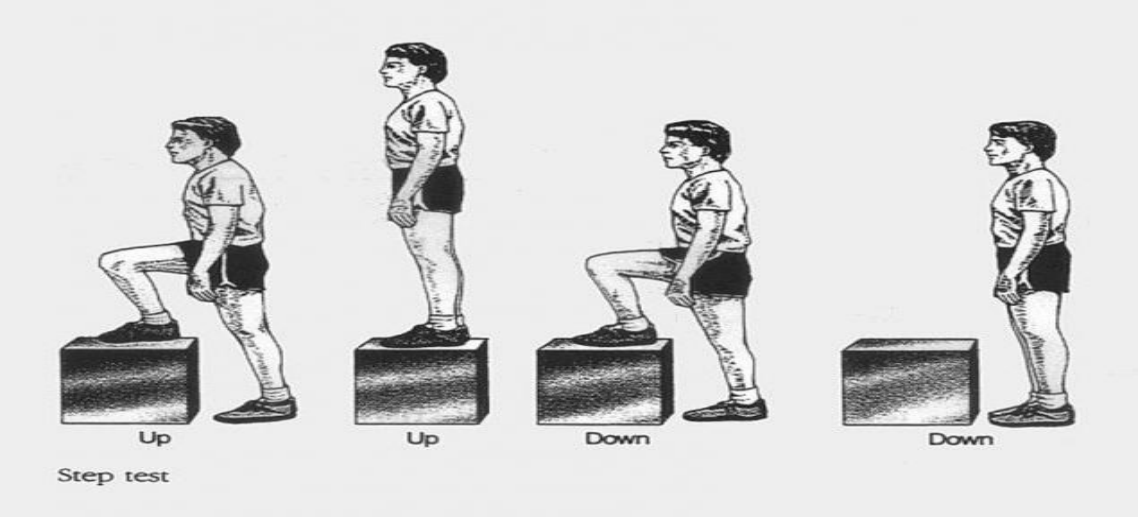
Pulse Taken: 3 times after test (1-1.5 min, 2-2.5 min, 3-3.5 min)

Score Formula:

(Exercise Duration in Seconds)×100÷(Sum of 3 pulse readings)×2

Fitness Levels:

- 90 Excellent,
- 80–89 Good,
- 65–79 Average,
- <65 Poor



COMPUTING BASAL METABOLIC RATE (BMR)

Basal metabolic rate (BMR) estimates the minimum number of calories a person needs to burn to sustain their basic life functions during a 24-hour period of rest.

Equipment: Stadiometer, Weight machine, Pen and paper

Procedure: Measure Height and Weight and put the values in the equations below

Formula used: The Mifflin-St Jeor BMR Equation

Male: (10 * weight (kg.)) + (6.25 * height (cm)) – (5 * age) + 5

Female: (10 * body weight (kg.)) + (6.25 * height (cm)) - (5 * age) –161

IMPORTANCE OF BMR:-

1. **Helps in Weight Management**
   – Understanding BMR helps determine how many calories you need daily to maintain, gain, or lose weight.
2. **Personalized Diet Planning**
   – BMR allows nutritionists and dieticians to create customized meal plans based on your energy needs.
3. **Guides Exercise and Fitness Goals**
   – Knowing BMR helps set realistic fitness goals by estimating total daily energy expenditure (TDEE).
4. **Monitors Metabolic Health**
   – Abnormally low or high BMR can indicate hormonal or metabolic disorders like hypothyroidism or hyperthyroidism.
5. **Improves Athletic Performance**
   – Athletes use BMR to ensure they are fueling their bodies with adequate energy for performance and recovery.

RIKLI & JONES - SENIOR CITIZEN FITNESS TEST

The assessments was designed by **Rikli and Jones in 2001** at California State University, Fullerton. The test items of Rikli & Jones Senior Citizen Fitness Test are:

ARM CURL TEST

Objective: To assesses upper-body strength.

Procedure: On the command "Go" the individual flexes the elbow or curls the arm with full range of motion then returns back to its initial position. (Dumbbell for men- 8 pounds (3.6kgs) and women- 5 pounds (2.3kgs)

Scoring: Maximum number of correct arm curls in 30 second

SCRATCH TEST OF THE BACK

Objective: To assess upper body flexibility.

Procedure: In standing position participant will place one hand over the shoulder and one hand middle of the back and try to touch or overlap each other.

Scoring: Measurement will be taken by measuring the distance between the tips of the middle fingers. If the fingertips touch, then the score is zero. If they do not touch, measure the distance between the finger tips (a negative score), if they overlap, measure by how much (a positive score).

CHAIR STAND TEST

Objective: To assess lower body strength.

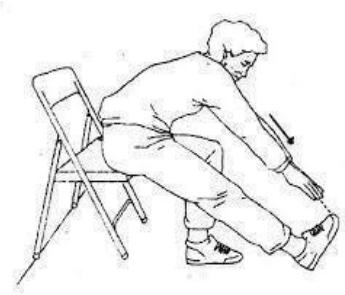
Procedure: On the command "Go" the individual will stand up completely, then return back to the initial position.

Scoring: Maximum number of complete stands in 30 seconds.

CHAIR SIT & REACH TEST

Objective: To assess lower body flexibility.

Procedure: Participant sits on the chair with one foot flat on the floor and the other leg extended forward with the knee straight, heel on the floor, and ankle bent at 90°. The participant, then, tries to touch the toe of that foot by bending at the hip and sliding her/his hands towards the toes.



Scoring: Measurement will be taken between extended long finger and tip of the toe and minimum to .5 inches will be recorded as score

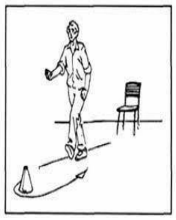
EIGHT-FOOT UP AND GO TEST

Objective: To assess speed and agility.

Procedure: The participant sits in the chair, hands on thighs, feet flat on the floor.

- On the command **"Go!"**, the stopwatch starts.
- The participant:

1. **Stands up** from the chair
2. **Walks** (as quickly and safely as possible) to the marker **8 feet away**
3. **Turns around** the marker



4. **Returns** to the chair
5. **Sits down**

The stopwatch is **stopped as soon as the participant sits back down.**

Scoring: Two attempts will be made and the best score will be taken for record.

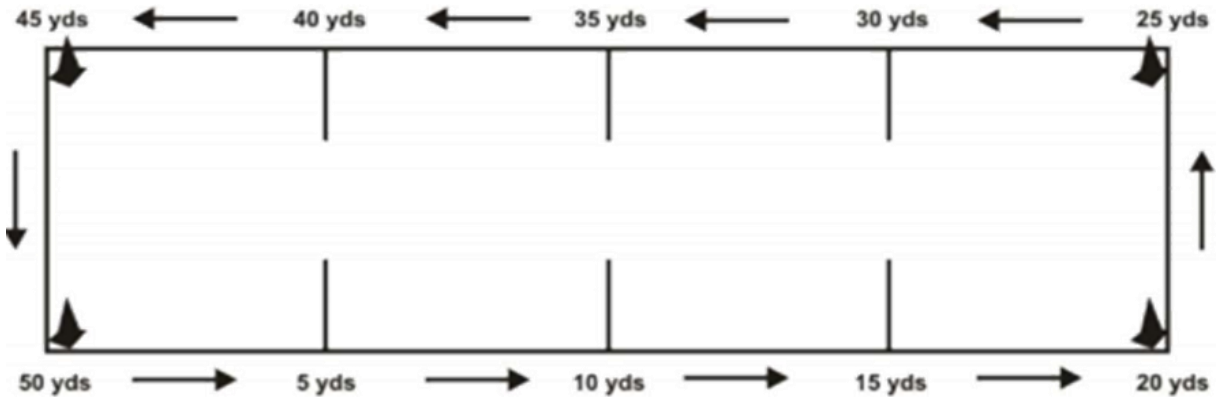
Fastest time taken between command "Go" and return to the chair will be recorded.

6 MINUTE WALK TEST

Objective: This is to assess aerobic fitness.

Procedure: Participant will start walking after the command "Go" and continuously walk on the track for 6 minutes.

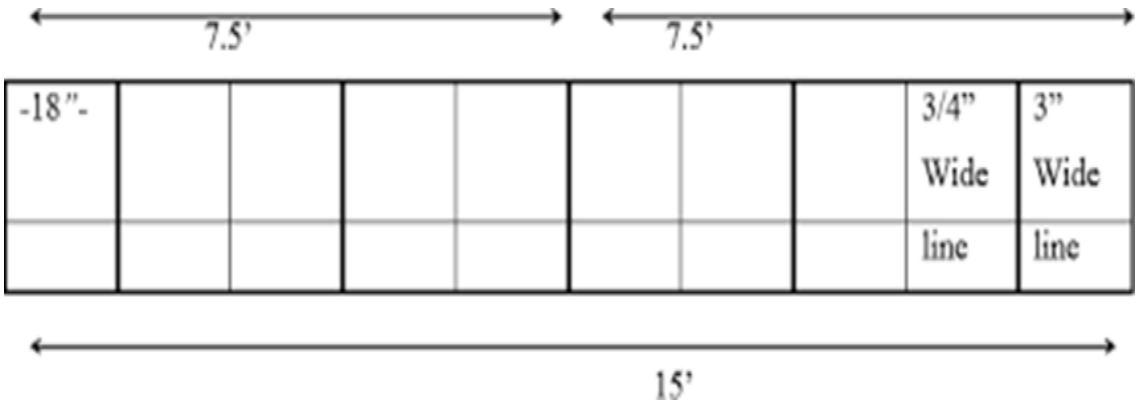
Scoring: Maximum distance covered in 6 minutes will be recorded as score



JOHNSON – METHNEY TEST OF MOTOR EDUCABILITY

Johnson- Metheny Test battery is revised version of Johnson Educability Test which was designed in 1932. The purpose of the Johnson battery was to measure neuromuscular skill capacity. This originally consisted of 10 steps . In **1938** Methney studied the test and eliminated six test items

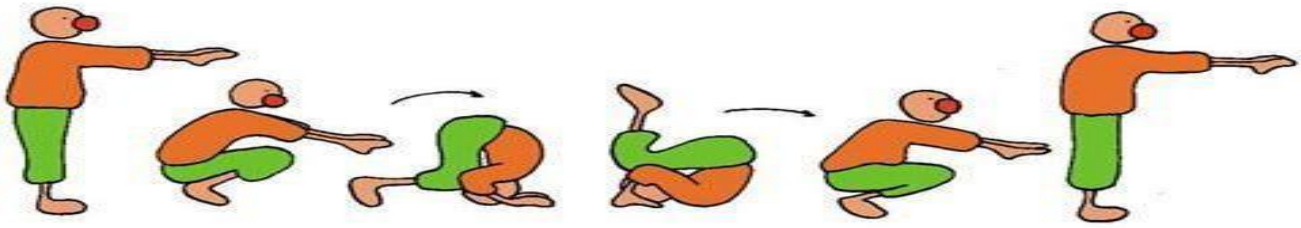
Layout of **Johnson- Metheny Test**



The test items of Johnson- Metheny Test battery are:

FRONT ROLL

Procedure: The subject is asked to start outside the marked area and perform two front rolls, one up to 7.5' i.e. 3" wide centre line and the second in the other half of 7.5'. The subject is to perform the rolls without touching the limits or over reaching the zones mentioned above.

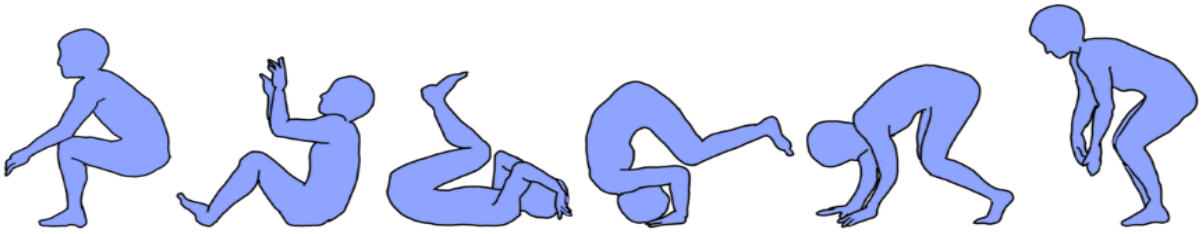


Scoring: Each correct roll gets 5 points, hence maximum of 10 points. Two points are deducted for over-reaching side line, right or left for each roll; one point is deducted for over reaching the end limit on each roll and full five points are deducted when the subject fails to perform a true front roll

BACK ROLL

Procedure: The subject is to start outside the marked chart area and is to 'perform two back rolls in the 2 feet lane area, one up to first half and the second back roll in the second half.

Scoring: Similar as Front Roll Test.



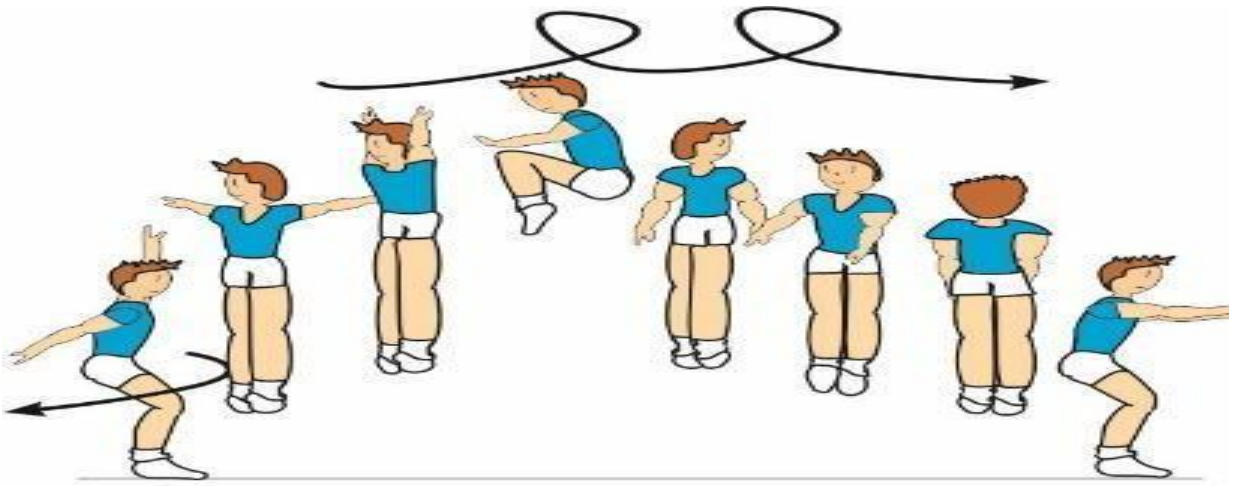
JUMPING HALF TURNS

Procedure: The subject is asked to start with feet on first 3" line, jump with both feet to second 3" wide line, executing a half turn either right or left; jump to third 3" line executing half turn in opposite direction to first half-turn and then to 4th and 5th 3" wide lines executing half turns, right or left alternatively.

Scoring: Perfect execution of four jumps is worth ten points. Only 2 points are deducted for each wrong jump when the subject either does not land with both feet on the 3" line or turns the wrong way or both.

JUMPING FULL TURN

Procedure: The subject is asked to start with the feet outside the marked area at about the centre of the lane. He/ She is required to jump with feet together to second rectangular space, executing a full turn with the body either right or left; continue jumping to alternate rectangular spaces across the marked mat executing full turns, rotating body in the same direction, landing on both feet every time.



Scoring: Perfect execution of five jumps is worth ten points. Two points are deducted, if the subject fails to keep balance on landing on both feet; turns too far or oversteps the squares.

MULTIPLE CHOICE QUESTIONS: 01Marks

1.Which of the following is used to measure cardiovascular endurance?

A. Sit and Reach Test
B. 50 Meter Dash
C. HARVARD Step Test
D. Standing Broad Jump

Answer: C. HARVARD Step Test

2. The 'Sit and Reach Test' is primarily used to assess:

A. Muscular strength
B. Flexibility
C. Agility
D. Endurance

Answer: B. Flexibility

3. Which test is used to measure abdominal strength?

A. Pull-Up Test
B. 600 Meter Run
C. Sit-Up Test
D. Shuttle Run

Answer: C. Sit-Up Test

4. Which test is suitable for assessing agility in school children?

A. 50 Meter Sprint
B. Shuttle Run
C. Vertical Jump
D. Skinfold Measurement

Answer: B. Shuttle Run

5. What is the primary purpose of measurement in physical education?

A. To compete with others
B. To evaluate physical fitness and performance
C. To assess academic performance
D. To determine grades in other subjects

Answer: B. To evaluate physical fitness and performance

6.Which of the following is a test for upper body strength?

A. Push-Up Test
B. Sit and Reach Test
C. 600 Meter Run
D. Shuttle Run

Answer: A. Push-Up Test

7. The purpose of the Standing Broad Jump test is to measure:

A. Agility
B. Flexibility
C. Explosive leg power
D. Reaction time

Answer: C. Explosive leg power

8. Which of the following is used to assess speed?

A. 50 Meter Dash
B. Sit-Up Test
C. Sit and Reach Test
D. HARVARD Step Test

Answer: A. 50 Meter Dash

9. Which is component of fitness tested by the "Arm Curl Test"?

A. Endurance B. Strength C. Agility D. Balance

Answer: B. Strength

10. The term 'test' in physical education refers to:

A. A final exam
B. A tool to evaluate skill and fitness levels
C. A written questionnaire
D. A set of sports rules

Answer: B. A tool to evaluate skill and fitness levels

11.Back scratch test is used to test fitness of:

A. Lower body part
B. Shoulder only
C. Upper body part
D. Elbows only

Answer: B. Shoulder only

12.The test used to measure fitness of senior citizens is

A. Borrow motor fitness test
B. HARVARD step test
C. Rikli and Jones fitness test
D. General motor fitness test

Answer: C. Rikli and Jones fitness test

13.What should be the height of chair required in chair sit and reach test?

A. 40 cm B. 44 cm C. 42 cm D. None of the above

Answer: B. 44 cm

14.Which of following are part of In the SAI Khelo India Fitness test for age group 5-8?

A. BMI
B. Flamingo Balance Test
C. Plate tapping test
D. All of the above

Answer: D. All of the above

15. Which of the following tests is used to measure cardiovascular endurance?

A) Sit and Reach Test
B) 50-Metre Sprint Test
C) Harvard Step Test
D) Push-Up Test

Answer:
C) Harvard Step Test

16.Which one of the following is NOT linked accurately?

A. Arm Curl Test-A test to measure the upper body strength
B. Chair sit and reach test-A test to assess the upper body flexibility
C. Chair stand test -A test to measure the lower body strength
D. Eight foot up and go test-A test to evaluate speed and agility

17.In the back scratch test if the finger tips touch each other, then the score will be:

A. Negative B. Zero C. Positive D. None of the above

18.Eight foot up and go test is conducted to check the Coordination and agility in

A. Children B. Adolescent C. Aged people D. Youth

19.Which of the following test is part of Johnson- Metheny Test battery for Motor educability.

A. Front Roll B. Back Roll C. Jumping half-turn D. All of the above

20. (10 * body weight (kg.)) + (6.25 * height (cm)) - (5 * age) –……. Complete the formula for calculating the BMR for females.

A. 141
B. 151
C. 161
D. 171

VERY SHORT ANSWER QUESTIONS 2 MARKS

Q1. What do you understand by the term 'test' in physical education?
Answer: A test is a tool designed to assess specific physical skills or fitness levels.

Q2. How is 'measurement' defined in the context of sports?

Answer: Measurement refers to the process of collecting data using standard tools and techniques to evaluate performance.

Q3. Mention one key objective of conducting tests and measurements in sports.

Answer: One main objective is to determine the fitness level of a person.

Q4. Which test helps in evaluating heart and lung endurance?

Answer: The HARVARD Step Test is used to assess cardiovascular endurance.

Q5. State a test that measures the flexibility of an individual.

Answer: Flexibility can be checked using the Sit and Reach Test.

Q6. Name a test that helps assess lower body strength.

Answer: The Standing Broad Jump is used to evaluate leg power.

Q7. Give one application of anthropometric measurements in physical education.

Answer: They are used to study and analyze body composition.

Q8. Which physical ability is evaluated by performing a 50-meter sprint?

Answer: Speed is assessed through the 50-meter dash.

Q9. What is meant by 'evaluation' in the field of physical education?

Answer: Evaluation involves interpreting test results to make decisions or judgments.

Q10. Can you name a test that is used to check a person's agility?

Answer: The Shuttle Run Test is used to measure agility.

Q 11: Identify the test shown in the picture. What does it measure?

Answer: The test is the HARVARD Step Test. It measures cardiovascular endurance.

Q12: Name the test shown. Which fitness component does it assess?

Answer: The test is the Sit and Reach Test. It assesses flexibility, especially of the lower back and hamstrings

Q11. What is body composition and how can it be measured?

Q12. Your grandmother feels she has reduced her upper body flexibility and therefore she wants to test herself. Which test would you suggest to her?

Q13. What is motor educability test and how can it be measured?

Q14. What is the purpose of conducting motor fitness tests in schools?

Q15. Name any one test used for assessing muscular endurance and explain how it is performed.

SHORT ANSEER QUESTION 3 MARKS

Q1. Define the term 'test' and explain its importance in physical education.

Answer:
A test is a tool or instrument used to measure a specific skill, fitness component, or performance ability. It is important in physical education because it helps in assessing the effectiveness of training programs, identifying strengths and weaknesses, and guiding future training needs.

Q2. What is the difference between 'measurement' and 'evaluation' in sports?

Answer:
Measurement is the process of collecting data through tests using standard tools and techniques.
Evaluation involves interpreting the results of measurements to make informed decisions or judgments regarding performance or fitness.

Q3. Write any three objectives of test and measurement in physical education.

Answer:
1. To assess the fitness levels of individuals.
2. To evaluate the effectiveness of training programs.
3. To identify talent and potential in sports.

Q4. Explain the procedure of the Sit and Reach Test.

Answer:
The participant sits on the floor with legs extended straight ahead and feet flat against a box or board.
They slowly reach forward as far as possible without bending the knees.
The distance reached by the fingertips is measured in centimeters to assess flexibility, especially of the lower back and hamstrings.

Q5. What is the HARVARD Step Test and what does it measure?

Answer:
The HARVARD Step Test is a cardiovascular endurance test. It involves stepping up and down a platform (around 18 inches) at a set pace for 5 minutes. Heart rate is recorded after the exercise, and recovery rate is used to determine cardiovascular fitness.

Q6. Define BMR and explain its role in fitness assessment.

Answer:
Basal Metabolic Rate (BMR) is the amount of energy expended while at complete rest to maintain vital body functions. It is essential in fitness assessments as it helps in determining caloric needs, planning diet and weight management, and understanding how individual metabolism affects overall physical performance.

Q7. Explain any three standard fitness tests used in sports.

Q8. State any three career options related to test and measurement in sports.

Q9. What is the importance of test and measurement in sports?

CASE STUDY BASED QUESTIONS 4 MARKS

1.Case:

Riya, a class 7 student, took part in the Khelo India School Fitness Test. She was evaluated in various components like BMI, 50m sprint, sit and reach test, and endurance run/walk. Her PE teacher recorded her performance to assess her overall fitness level.

Q1. Which component of fitness is assessed through the 50m sprint?
a) Flexibility b) Cardiovascular endurance
c) Speed d) Agility
Answer: c) Speed

Q2. The Sit and Reach test measures:
a) Speed b) Flexibility
c) Strength d) Balance
Answer: b) Flexibility

Q3. Which of the following is part of the Khelo India fitness assessment?
a) BMR Calculation b) Harvard Step Test
c) BMI Measurement d) Skinfold Testing
Answer: c) BMI Measurement

Q4. What age group is primarily targeted under the Khelo India School Fitness Test?
a) Under 5 b) School-going children
c) College athletes d) Senior citizens
Answer: b) School-going children

2.Case:

Rohan, a 17-year-old football player, is asked to perform the Harvard Step Test to measure his cardiovascular endurance. He steps up and down a bench for 5 minutes at a set rhythm, and his recovery pulse is recorded.

Q1. The Harvard Step Test evaluates:
a) Strength b) Flexibility
c) Cardiovascular endurance d) Speed
Answer: c) Cardiovascular endurance

Q2. For how long should the subject perform the stepping exercise in Harvard Step Test?
a) 2 minutes b) 3 minutes c) 5 minutes d) 10 minutes
Answer: c) 5 minutes

Q3. What is primarily recorded in the Harvard Step Test to compute fitness index?
a) Jump height b) Body weight
c) Recovery heart rate d) Body fat
Answer: c) Recovery heart rate

Q4. A low fitness index in the Harvard Step Test indicates:
a) Excellent cardiovascular fitness b) Average strength
c) Poor cardiovascular fitness d) High flexibility
Answer: c) Poor cardiovascular fitness

3.Case:

Sneha wants to manage her weight effectively. Her fitness trainer calculates her Basal Metabolic Rate (BMR) to determine the minimum calories her body needs at rest to maintain basic functions like breathing and circulation.

Q1. BMR refers to:
a) The calories burned during exercise b) The rate of digestion
c) The energy used at rest d) The calories stored as fat
Answer: c) The energy used at rest

Q2. Which factor does *not* affect BMR?
a) Age b) Gender c) Skin color d) Muscle mass
Answer: c) Skin color

Q3. Which tool/formula is commonly used to calculate BMR?
a) BMI Scale b) Skinfold Caliper c) Harris-Benedict Equation d) Cooper's Formula
Answer: c) Harris-Benedict Equation

Q4. If BMR is high, what does it indicate?
a) The person burns fewer calories b) The person needs less food
c) The person burns more calories at rest d) The person is malnourished
Answer: c) The person burns more calories at rest

4.Case:

Mrs. Sharma, a 70-year-old woman, visits a wellness center for a fitness evaluation. The trainer uses the Rikli & Jones test to assess her functional fitness needed for daily activities, such as arm curl test and chair stand test.

Q1. The Rikli & Jones test is designed for:
a) School children b) Young athletes c) Senior citizens d) Bodybuilders
Answer: c) Senior citizens

Q2. Which component is tested through the 30-second chair stand test?
a) Upper body strength b) Lower body strength
c) Cardiovascular endurance d) Flexibility
Answer: b) Lower body strength

Q3. The "Arm Curl" test in Rikli & Jones is used to assess:
a) Reaction time b) Arm endurance

c) Upper body strength d) Speed
Answer: c) Upper body strength

Q4. The "8-foot up-and-go" test is a part of:
a) Harvard Step Test b) SAI Khelo India
c) Rikli & Jones Test d) Johnsen – Methney Test
Answer: c) Rikli & Jones Test

5.Case:

A school PE teacher uses the Johnsen – Methney test to assess class 6 students' basic motor skills such as jumping, running, and catching. This helps to understand their potential to learn motor movements.

Q1. The Johnsen – Methney Test is used to measure:
a) Endurance b) Flexibility c) Motor educability d) Intelligence

Q2. Which of the following is usually included in the Johnsen – Methney Test?
a) Shuttle run b) Height and weight c) Throwing and catching d) Skinfold measurements

Q3. Who is the target group for the Johnsen – Methney Test?
a) Senior citizens b) Infants c) School-age children d) Professional athletes

Q4. The term "motor educability" refers to:
a) Endurance for long races b) Learning and performing motor tasks
c) Muscular strength d) Nutritional knowledge

6.Case:

A fitness trainer is designing a plan for a school. He wants to assess students' cardio fitness, flexibility, speed, and motor skills. He plans to use multiple tests such as Khelo India Fitness Test, Harvard Step Test, and Johnsen – Methney Test.

Q1. To assess speed, which test should be included?
a) Sit and Reach b) 50-meter sprint
c) Chair stand test d) Harvard Step Test

Q2. Which test among the following is best suited for measuring cardiovascular endurance?
a) Harvard Step Test b) BMI
c) Push-ups d) Sit-ups

Q3. For evaluating motor learning ability, which test is appropriate?
a) BMR Calculation b) Rikli & Jones
c) Johnsen – Methney d) Skinfold Test

Q4. If a PE teacher wants to assess flexibility, which test is ideal?
a) Arm curl b) Sit and reach c) Step test d) BMI

LONG ANSWER QUESTION 5 MARKS

Q1. Explain SAI Khelo India Fitness test for age group 9-18 yrs age group.

Answer:

SAI Khelo India Fitness Test is a fitness assessment program designed by the Sports Authority of India (SAI) and the Ministry of Youth Affairs and Sports for school students across India.

BMI (Body Mass Index): BMI is a simple and widely used method to assess if a person has a healthy body weight in proportion to their height. It is calculated by dividing a person's weight in kilograms by the square of their height in meters.

50-Meter Sprint Test: The 50-meter sprint test measures how quickly a student can run over a short distance. This test assesses the student's anaerobic power and speed.

600-Meter Run/Walk Test : The 600-meter run/walk test measures cardiovascular endurance. Students are required to run/walk the distance as quickly as possible, and their time is recorded.

Sit and Reach Flexibility Test : The sit and reach test measures the flexibility of the student's lower back and hamstring muscles. The student sits on the floor with their legs straight, and then reaches forward as far as possible while keeping their legs straight.

Partial curl up: Abdominal partial curl-up is a test of abdominal muscle endurance. The participant lies on their back with knees bent and feet on the floor. They cross their arms over their chest and curl up to touch their knees with their elbows. They repeat this movement as many times as possible within a specified time.

Push Ups: Push-ups are a test of upper body strength. For boys, they perform push-ups with their toes and hands on the ground, and they lower their body to touch the ground and then push themselves back up. For girls, they perform modified push-ups with their knees on the ground instead of their toes.

Q2. Explain in detail the HARVARD Step Test. Mention its purpose, procedure, advantages, and limitations.

Answer:

The HARVARD Step Test is a widely used cardiovascular endurance test designed to measure the efficiency of the heart and lungs during recovery after physical activity.

Purpose:

The primary aim of this test is to assess cardiovascular fitness and the body’s recovery rate after exercise. A faster recovery indicates better endurance and heart efficiency.

Procedure:

1. A bench or platform around 18 inches high is used.
2. The subject steps up and down the platform at a rate of 30 steps per minute for 5 minutes (150 steps total).
3. After completion, the subject sits down, and their pulse is measured three times: at 1 minute, 2 minutes, and 3 minutes post-exercise.
4. The fitness index is calculated using the formula:

FI = (Duration of exercise in seconds × 100) / (2 × sum of heartbeats at 1, 2, and 3 minutes).

Advantages:

- Simple and low-cost.
- Requires minimal equipment.
- Can be conducted on a large group with ease.
- Suitable for all age groups.

Limitations:

- Not suitable for individuals with joint or knee issues.
- Results can be influenced by body weight or leg length.
- It requires a consistent pace which may be difficult without a metronome.

This test is useful in schools, gyms, and sports training to check the aerobic fitness level of students and athletes.

Q3. Write a detailed note on the importance and objectives of test and measurement in physical education and sports.

Test and measurement play an integral role in scientific training and performance evaluation in the field of physical education and sports. They are used to collect accurate data, monitor progress, and make informed decisions regarding training and participation.

Importance:

1. **Assessment of Fitness Levels:** Tests help identify the current level of an individual's physical fitness. This includes strength, flexibility, endurance, and speed.
2. **Monitoring Progress**: By repeating the same tests periodically, trainers and teachers can track improvements or declines in performance.
3. **Selection and Classification:** Tests help in selecting individuals for specific sports based on their skills, fitness, and body structure.
4. **Talent Identification:** Through regular measurement, students with specific physical advantages can be guided into appropriate sports disciplines.
5. **Scientific Training Planning:** Data from tests allows for creating personalized training programs that are suited to an individual's needs and goals.

Objectives:

1. **Diagnose Strengths and Weaknesses**: It helps in understanding which areas need more focus and improvement.
2. **Evaluate the Effectiveness of a Program:** Helps to see if a training routine is delivering the expected results.
3. **Motivate Students and Athletes:** Visible progress through test results encourages continued effort and discipline.
4. **Establish Norms and Standards:** Benchmarking results help in setting standards and grading performance levels.

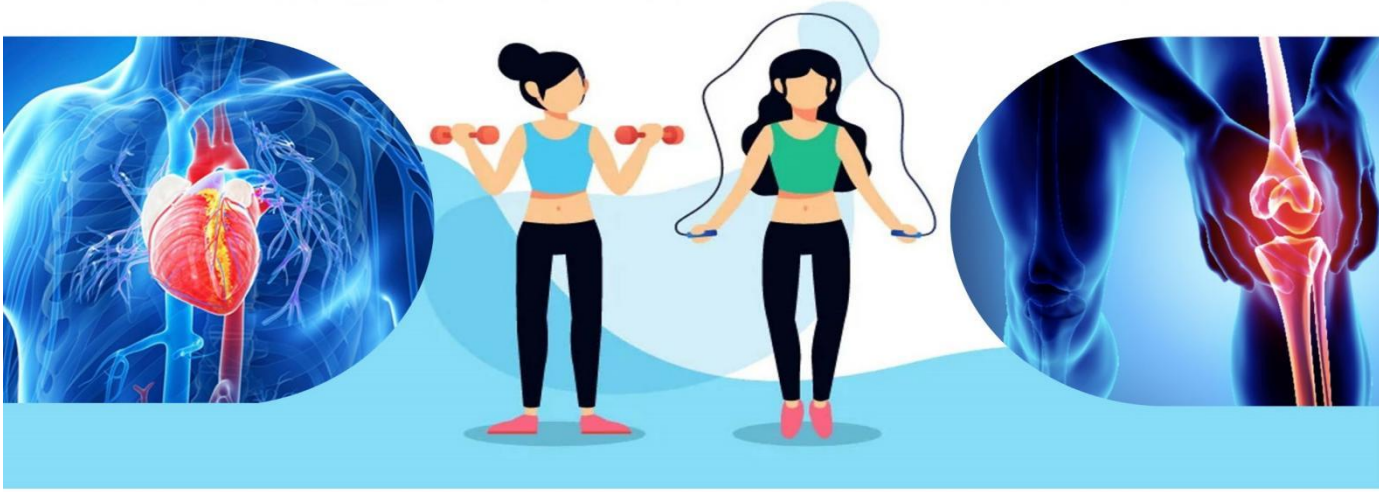
In summary, test and measurement ensure that training becomes scientific, objective, and individualized, enhancing both participation and performance in sports.

Q4. Write a detailed note on the importance and objectives of test and measurement in physical education and sports.

Q5. Discuss the Sit and Reach Test in detail. Explain its aim, procedure, scoring, advantages, and limitations.

UNIT - VII

PHYSIOLOGY & INJURIES IN SPORTS



CONTENT:

1. Physiological factors determining components of physical fitness
2. Effect of exercise on the Muscular System
3. Effect of exercise on the Cardio-Respiratory System
4. Physiological changes due to aging
5. Sports injuries: Classification
6.

GIST : *This unit explores how the body supports physical fitness through muscles, heart, and lungs, and how exercise enhances their functions. It explains the effects of ageing on the body and highlights common sports injuries, their types, and management. This promotes fitness awareness, injury prevention, and lifelong physical well-being.*

LEARNING OUTCOMES

By the end of this unit, you will be able to:

1. Identify key physiological factors that affect physical fitness components.

2. Understand how the muscular system benefits from regular exercise.

3. Explain how exercise improves the function of the heart and lungs.

4. Recognize how ageing affects body systems and the role of physical activity in healthy ageing.

5. Classify and describe different types of sports injuries and understand basic prevention and management techniques.

LEARNING OBJECTIVES:

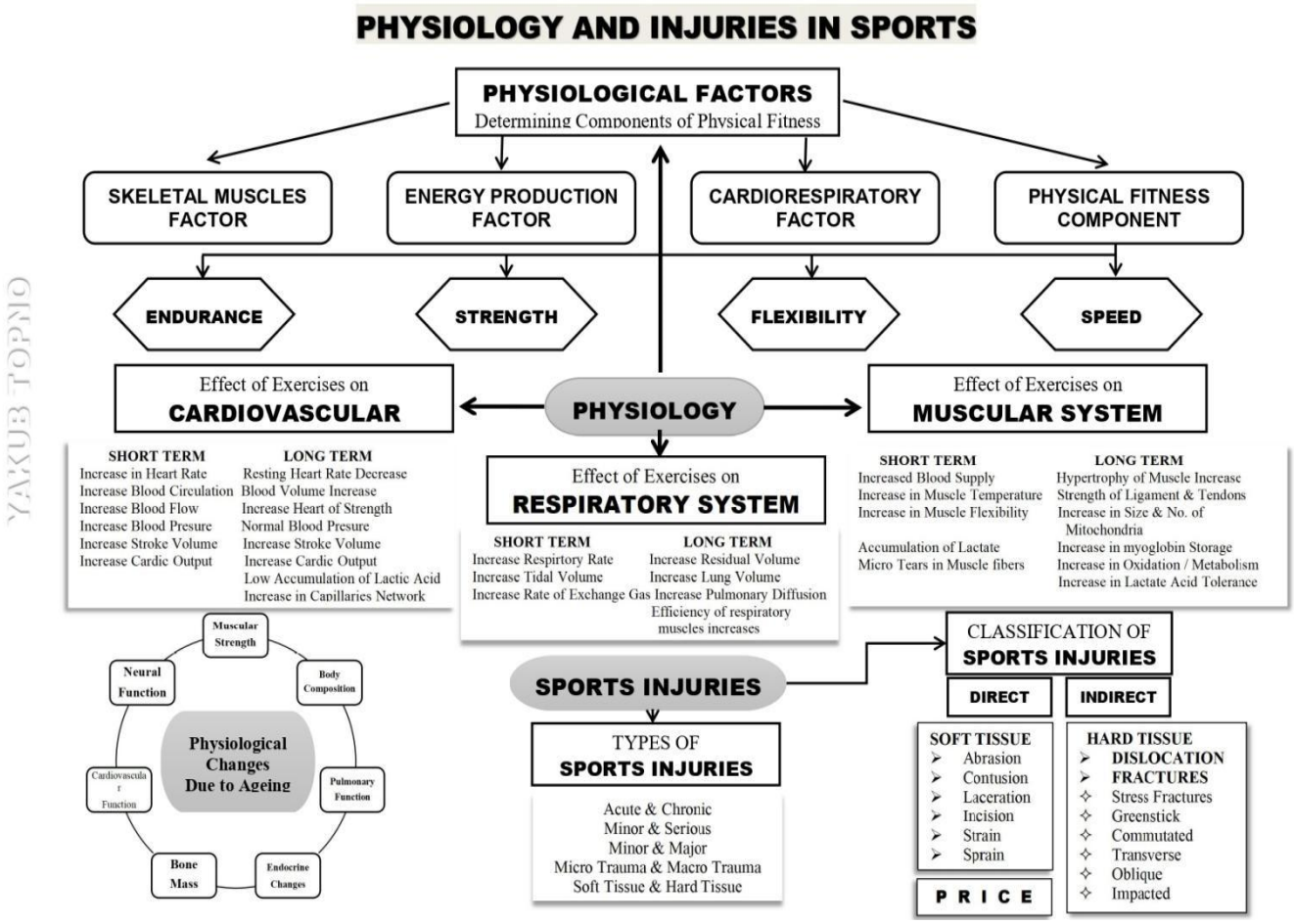
1. Recognize the physiological factors determining the components of physical fitness.
2. Comprehend the effects of exercise on the Muscular system and cardiorespiratory systems.
3. Figure out the physiological changes due to ageing
4. Classify sports injuries with their management.

UTILITY OF THE UNIT IN DAILY LIFE

Understanding *Physiology and Injuries in Sports* is highly beneficial in everyday life. It helps individuals recognize how their body functions during physical activities and the importance of maintaining fitness through regular exercise. By learning about muscular and cardiorespiratory responses, one can design safer and more effective fitness routines. The knowledge of ageing effects encourages healthy lifestyle habits from an early age. Additionally, awareness of common sports injuries and their management empowers individuals to take timely action, apply first aid, and prevent further harm. This unit fosters responsible participation in sports, promotes injury-free activity, and builds a foundation for lifelong health and fitness. It is essential for students, athletes, coaches, and anyone involved in physical activity.

MIND MAP

MARKS WEIGHTAGE – 04 + 04b*



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7.1 Physiological Factors Determining Components of Physical Fitness

Exercise physiology is all about how our body reacts and adapts when we exercise. Think of your body as a well-coordinated team, where each system has a special role to play during physical activity.

When you work out or play sports, many systems in your body – like muscles, nerves, heart, lungs, hormones, and more – work together. But each system responds in its own unique way depending on what kind of exercise you're doing.

- The **metabolic system** gives you energy and controls how much energy you use or save.
- The **cardiovascular system** (heart and blood vessels) pumps oxygen and nutrients to your muscles and carries away waste products.
- The **respiratory system** (lungs) brings in fresh oxygen and removes carbon dioxide when you breathe.
- The **muscular and skeletal systems** help you move by contracting muscles and supporting your body.
- The **nervous and hormonal systems** help keep everything balanced, adjusting to stress and maintaining your internal stability (called ***homeostasis***).

Different exercises affect your body in different ways. For example, running, lifting weights, and yoga all improve fitness, but they challenge your body systems differently—through different intensity, duration, and purpose.

In this , we will focus on **three main physiological factors** that influence your physical fitness:

- **Muscle fiber types**
- **Energy systems**
- **Cardiorespiratory functions**

Each of these plays a key role in how strong, fast, or fit you become.

7.1.1 Muscle Fiber Factor – What Makes You Fast or Enduring?

Our muscles are made up of different types of muscle fibers. These fibers decide whether you're naturally better at endurance sports like marathon running or power sports like sprinting and weightlifting.

There are two main types of muscle fibers:

1. Slow-Twitch Fibers (Type I) – The Endurance Experts

- **Colour**: Red (they have more blood supply and oxygen)
- **Work Style**: Use oxygen to produce energy slowly (aerobiC)

- ✧ **Best For**: Long-duration activities like running, swimming, cycling
- ✧ **Strength**: They don't get tired quickly
- ✧ **Speed**: Contract slowly, not suitable for explosive speed

2. Fast-Twitch Fibers (Type II) – The Power Performers

- ✧ **Colour**: White (less blood supply)
- ✧ **Work Style**: Work without oxygen (anaerobiC) and produce quick bursts of energy
- ✧ **Best For**: High-power activities like sprints, jumps, weightlifting
- ✧ **Strength**: Very strong but get tired quickly
- ✧ **Speed**: Contract very fast for explosive movements

Muscle Fiber Distribution (Varies by Activity)

Type of Athlete	Slow-Twitch Fibers	Fast-Twitch Fibers
Marathon Runners	70–80%	20–30%
Sprinters	25–30%	70–75%
Average Non-Athletes	~50%	~50%

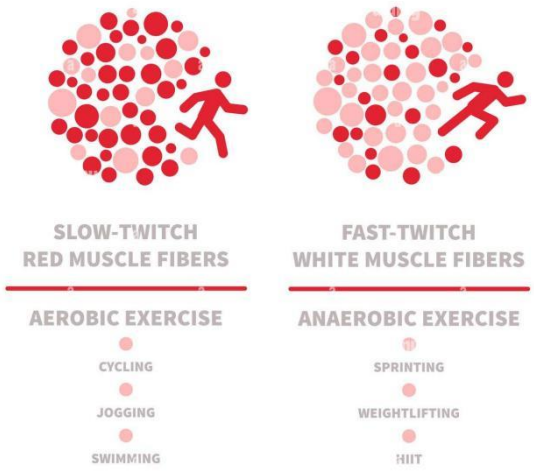


Fig.1: *Diagram showing both fiber types inside a muscle*

Quick Fact:

You are born with a certain mix of fiber types. Training can improve their performance, but your basic mix is genetic.

7.1.2 Energy Production Factor – How Your Body Powers Every Move

Every time you move, play, or even blink – your body uses energy. During sports or exercise, your body has to act fast to supply this energy, and it does so using **three different energy systems**. Each one works based on how intense and how long the activity is.

Let's understand these systems like fuel tanks – some give you quick power, others last longer.

1. ATP-CP System – The Instant Power Boost

- **Duration**: Only up to 10 seconds
- **Fuel Used**: Stored ATP (adenosine triphosphate) and CP (creatine phosphate) in muscles
- **Oxygen Used**: No (AnaerobiC)
- **Best For**: Short, explosive efforts like high jump, 100m sprint, or a shot-put throw
- **Speed**: Super-fast but doesn't last long.

2. Anaerobic System – Power Without Oxygen

- **Duration**: From 10 seconds to 2 minutes
- **Fuel Used**: Glucose, broken down without oxygen
- **Oxygen Used**: No (AnaerobiC)
- **Best For**: Medium bursts of effort like 200m or 400m races
- **Speed**: Fast energy, but creates lactic acid, which causes fatigue.

3. Aerobic System – Long-Lasting Energy

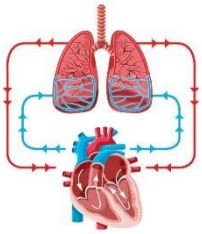
- **Duration**: More than 2 minutes
- **Fuel Used**: Carbohydrates, fats (with oxygen)
- **Oxygen Used**: Yes (AerobiC)
- **Best For**: Long-duration sports like marathon, football, hockey
- **Speed**: Slow to start, but keeps you going for a long time

Best Way to Remember

System	Duration	Fuel Used	Sports Example
ATP-CP	0–10 sec	ATP, CP	Shot put, 100m sprint
Anaerobic	10 sec–2 min	Glucose	400m run, boxing round
Aerobic	2+ min	Carbs, fats	Marathon, football

7.1.3 Cardiorespiratory Factor – How Your Heart & Lungs Help You Perform?

Imagine your muscles are like engines. Just like engines need fuel and oxygen to run, your muscles need oxygen-rich blood during physical activity. This is where the cardiorespiratory system steps in. It includes your heart, blood vessels, and lungs, and it plays a key role in building stamina, improving performance, and helping you recover faster.



What Does the Cardiorespiratory System Do?

Delivers oxygen from lungs to muscles

Removes carbon dioxide (waste gas) from the body

Carries nutrients (like glucose) to working muscles

Keeps the body cool by increasing blood flow

The better your cardiorespiratory system, the **fitter and more energetic** you feel during sports or workouts!

Key Terms to Know

Term	Meaning
VO_2 Max	The maximum amount of oxygen your body can use during intense exercise
Stroke Volume	The amount of blood your heart pumps out with **each beat**
Cardiac Output	The **Total Blood** pumped by the heart in **One Minute**
Formula:	Cardiac Output = Heart Rate × Stroke Volume

Quick Fact:

Athletes like swimmers and runners train to improve their VO_2 max and cardiac output to boost performance.

7.1.4 Physical Fitness Components Determined by Physiological Factors

Now that we understand how our muscles, energy systems, heart and lungs respond to exercise, let's see how these systems help build the four main components of physical fitness:

1. Strength | 2. Speed | 3. Endurance | 4. Flexibility

1. Strength – Your Muscle Power

"*How much force your muscles can produce in a single effort*."

The stronger the muscles and the more fast-twitch fibers you have, the greater your strength.

Main Factor Involved:

- ✧ Muscle Fiber Type – Especially Fast-Twitch Fibers (Type II) which contract quickly and powerfully
- ✧ Energy System – ATP-CP system gives short, explosive energy for lifting or pushing

Example Activities: Weightlifting, Shot Put, Wrestling

2. Speed – How Fast You Can Move

"*The ability to perform a movement in the shortest time possible.*"

Speed depends on how fast your brain and muscles communicate + how quickly energy is supplied.

Main Factor Involved:

- ✧ Fast-Twitch Fibers – For rapid contraction
- ✧ ATP-CP System – Instant, explosive energy for movements under 10 seconds
- ✧ Neuromuscular Efficiency – Faster nerve signals = quicker reactions

Example Activities: Sprinting, Table Tennis, Badminton smashes

3. Endurance – Keep Going Without Getting Tired

"*The ability to perform an activity for a long period without fatigue.*"

The more oxygen your muscles get, the longer you can perform without tiring.

Main Factor Involved:

- ✧ Slow-Twitch Fibers – Use oxygen efficiently and resist fatigue
- ✧ Aerobic Energy System – Provides long-term energy using oxygen
- ✧ Cardiorespiratory Fitness – Strong heart and lungs supply steady oxygen

Example Activities: Long-distance running, Swimming, Football

4. Flexibility – How Easily You Can Move Your Joints

"The ability of joints to move through their full range of motion."

Flexibility isn't about muscle size—it's about how elastic and healthy your muscles and joints are.

Main Factor Involved:

- ✧ Muscle and Tendon Elasticity
- ✧ Warm Muscles (higher temperature improves stretch)
- ✧ Joint Structure and connective tissue health

Example Activities: Gymnastics, Yoga, Martial Arts

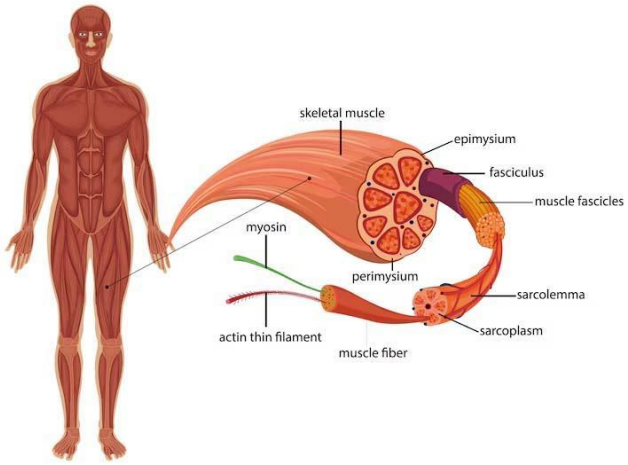
Summary Table

Component	Main Physiological Factor(s)	Example Activities
Strength	Fast-twitch fibers, ATP-CP system	Weightlifting, Shot Put
Speed	Fast-twitch fibers, nerve signal speed	Sprinting, Badminton
Endurance	Slow-twitch fibers, Aerobic system, VO_2 Max	Marathon, Football
Flexibility	Muscle temperature, joint health, elasticity	Gymnastics, Yoga

Each fitness component relies on different systems in your body. That's why athletes train differently based on their sport—some focus on building power, others on stamina or flexibility.

2. Effects of Exercise on the Muscular System

When you exercise or play sports, your muscles don't just move – they change. Some effects happen right away, while others take weeks or months of training to show.



Let's explore what happens to your muscles in the short term (immediately) and long term (after regular training).

A. Short-Term Effects (During or Right After Exercise)

These are the changes your body feels while exercising or shortly after. You've probably felt these before!

1.**Increased Blood Flow to Muscles:** Your body sends more blood to the working muscles to supply oxygen and remove waste.

2.Higher Muscle Temperature: Muscles heat up as they work harder – this helps with flexibility and movement.

3.Improved Flexibility: Warm muscles are easier to stretch and less likely to get injured.

4.Lactic Acid accumalation: When you push hard, your muscles may burn – that's due to lactic acid, a temporary waste product.

5.Micro-Tears in Muscle Fibers: Tiny tears occur in muscles during strength training. This is normal and necessary for growth.

B. Long-Term Effects (With Regular Exercise Over Time)

When you train consistently over weeks or months, your muscles begin to adapt in powerful ways:

1.Muscle Hypertrophy: Muscles grow bigger and stronger – this is how you build strength and size.

2.Stronger Tendons and Ligaments: Not just muscles, but the connective tissues also get stronger, reducing injury risk.

3.More Mitochondria: These are the "power plants" of your cells – more mitochondria = more energy production.

4.Increased Myoglobin Content: Myoglobin helps store oxygen in muscles, improving endurance.

5.Greater Glycogen Storage: Muscles store more fuel (glycogen), so you don't get tired as quickly.

6.Better Fat Burning: Your body becomes more efficient at using fat as energy – great for fitness and weight control.

7.Improved Lactate Tolerance: You can handle more exercise without feeling that burning fatigue.

3. Effects of Exercise on the Cardiorespiratory System

Your heart and lungs are your body's power supply team. When you exercise, these systems work harder to get oxygen to your muscles and remove carbon dioxide.

These changes can be short-term (right after exercise) or long-term (with regular training).

3.1 Cardiovascular System – Heart and Blood Vessels

A. Short-Term Effects (Immediate Changes)

1.Increased Heart Rate: Your heart beats faster to pump more blood and oxygen to the muscles.

2.More Blood Circulation: Blood flows quicker throughout the body, especially to working muscles.

3.Higher Blood Pressure: The force with which blood flows through your vessels increases.

4.Greater Stroke Volume: With each beat, your heart pumps more blood than usual.

5.Higher Cardiac Output: Total blood pumped per minute increases = more oxygen delivered.

B. Long-Term Effects (From Regular Training)

1.Stronger Heart Muscle: Like other muscles, the heart becomes more powerful and efficient.

2.Lower Resting Heart Rate: A fit heart doesn't need to work hard all the time—fewer beats per minute at rest.

3.Improved Blood Pressure Control: Exercise helps maintain normal blood pressure over time.

4.More Capillaries in Muscles: Extra tiny blood vessels form, improving nutrient and oxygen delivery.

5.Less Lactic Acid Buildup: With better oxygen supply, your muscles produce less lactic acid = less fatigue.

3.2 Respiratory System – Lungs and Breathing

A. Short-Term Effects

1.Faster Breathing Rate: You may go from 12–20 breaths per minute to 40+ during intense exercise.

2.Increased Tidal Volume: You take deeper breaths, pulling in more air each time.

3.Faster Gas Exchange: Oxygen goes into your blood faster, and carbon dioxide comes out quicker.

B. Long-Term Effects (With Regular Aerobic Exercise)

1.Stronger Breathing Muscles: Muscles like the diaphragm and intercostals get stronger, making breathing easier.

2.Bigger Lung Capacity: Your lungs can hold more air, allowing better oxygen supply.

3.Improved Oxygen Exchange Efficiency: Your body gets better at absorbing oxygen and using it effectively.

4.Increased Residual Volume: A small amount of air always remains in your lungs – even this improves with training.

4. Physiological Changes Due to Aging

As we grow older, our body slowly starts to change and slow down. These changes affect our muscles, bones, heart, lungs, and nerves—which can reduce our physical performance over time.

But the good news? Staying physically active can delay many of these effects and help you age healthily.

What Happens to the Body with Age?

A. Muscular System

✧ Peak strength is usually between ages 20 to 40.

- ✧ After 40, muscle mass starts to reduce – up to 40–50% by age 80.
- ✧ Muscles become weaker, and fibers shrink or die.
- ✧ This makes lifting, walking, and balance harder if not managed with exercise.

B. Nervous System

- ✧ Aging reduces the number of connections in the spinal cord by around 40%.
- ✧ Nerve signals slow down by about 10%, leading to slower reaction times.
- ✧ Movement becomes less coordinated.

C. Cardiovascular System

- ✧ The maximum heart rate decreases with age.
- ✧ Cardiac output (blood pumped per minute) also reduces.
- ✧ As a result, less oxygen and nutrients reach muscles during activity.

D. Respiratory System

- ✧ The chest wall becomes stiff, making it harder to breathe deeply.
- ✧ Lung capacity goes down, so oxygen intake is reduced.
- ✧ Slower breathing response to exercise.

E. Bone Mass

- ✧ After 60, 30–50% of bone density may be lost, especially in women.
- ✧ Bones become brittle and weak, leading to conditions like osteoporosis.
- ✧ Fractures and joint pain become more common.

F. Body Composition

- ✧ Body fat increases, while muscle mass and water content decrease.
- ✧ Total body weight may decrease, but fat percentage increases – especially around the waist.

Summary Table – Changes Due to Aging

Body System	Changes with Age
Muscles	Weaker, smaller, reduced strength
Nerves	Slower reflexes and coordination
Heart	Lower heart rate and blood flow
Lungs	Less air capacity, slower breathing
Bones	Loss of density, higher fracture risk
Body Composition	More fat, less muscle

5. Sports Injuries – When the Game Hurts

Sports keep us fit, but sometimes they come with risks. A sports injury is any damage to body tissues that causes pain, swelling, or limits movement during or after physical activity.

Whether you're a beginner or an athlete, knowing how injuries happen, how to prevent them, and how to treat them can keep you safe and active.

A. Based on the Cause

1.Direct Injury: Caused by an external force like a collision, fall, or getting hit.

Example: Getting hit by a ball, or falling during a match.

2.Indirect Injury: Happens due to internal stress—like overstretching or improper movement.

Example: Pulling a hamstring during a sprint.

3.Overuse Injury: Caused by repeating the same movement again and again without rest.

Example: Tennis elbow, runner's knee.

B. Based on the Tissue Affected

1.Soft Tissue Injuries – Skin, muscles, tendons, ligaments

2.Hard Tissue Injuries – Bones and cartilage

5.2 Soft Tissue Injuries

These are the most common in sports and can range from minor cuts to painful sprains.

A. Skin Injuries: These injuries often occur in contact sports or from falls on rough surfaces.

Type	Description
Abrasion	Scraping off the top layer of skin
Laceration	Irregular, jagged tear in the skin
Incision	Clean, deep cut usually by a sharp object

B. Muscle & Ligament Injuries

Type	Description
Contusion	A bruise caused by a D**irect blow**
Strain	Tearing or stretching of M**uscle or Tendon**

Sprain	Tearing or stretching of a L**igament (Joint)**

Treatment: RICE Method (For Most Soft Tissue Injuries)

Step	What to Do
R-Rest	Stop the activity and avoid pressure
I-Ice	Apply a cold pack to reduce swelling
C-Compression	Use an elastic bandage to control swelling
E-Elevation	Raise the injured part above heart level

5.3 Hard Tissue Injuries – Bones & Joints

These are serious injuries that usually need medical attention and sometimes surgery.

A. Joint Dislocation

- ✧ Occurs when bones are forced out of their normal position
- ✧ Caused by fall, collision, or trauma
- ✧ Symptoms: Pain, swelling, visible deformity, loss of movement
- ✧ Treated by a doctor to relocate bones safely

B. Bone Fractures (Broken Bones)

Type	Description
Stress Fracture	Small cracks from repeated stress (common in runners)
Greenstick	Bone bends but doesn't break completely (common in children)
Comminuted	Bone breaks into **multiple pieces** (severe traumA)
Transverse	**Straight horizontal break** across the bone
Oblique	**Angled or diagonal break**
Impacted	Ends of bones are **jammed together** (from hard falls)

Summary Table

Injury Type	Example	Treatment
Skin Injury	Abrasion, incision	Clean + Bandage

Muscle/Ligament	Sprain, Strain, Contusion	RICE Method
Bone Injury	Fracture, dislocation	Medical intervention needed

KEY TERMS TO REMEMBER

ATP: Energy currency of cells

Hypertrophy: Muscle growth

VO2 Max: Maximum oxygen consumption

Cardiac Output: Heart Rate × Stroke Volume

Aerobic: With oxygen

Anaerobic: Without oxygen

Myoglobin: Oxygen-carrying protein in muscles

Osteoporosis: Bone weakening disease

1. Multiple Choice Questions (MCQs) 1 MARK

(Choose the most appropriate option)

1.The muscle fiber type most helpful in long-distance running is:

A) Type II-a B) Type II-b C) Type I D) Mixed Fiber

Answer: C) Type I

2.Which energy system provides energy for a 100m sprint?

A) Aerobic system B) Anaerobic system

C) Lactic system D) ATP-CP system

Answer: D) ATP-CP system

3.VO_2 Max refers to:

A) Maximum number of heartbeats B) Volume of food intake

C) Maximum oxygen used during exercise D) Breathing rate at rest

Answer: C) Maximum oxygen used during exercise

4.A greenstick fracture is common in:

A) Adults B) Elderly C) Athletes D) Children

Answer: D) Children

5.Muscle hypertrophy occurs due to:

A) Flexibility training B) Overeating

C) Regular strength training D) Excess rest

Answer: C) Regular strength training

6.Which of the following improves flexibility?

A) Cold muscles B) Anaerobic training

C) Warm-up exercises D) Weightlifting

Answer: C) Warm-up exercises

7.Which system provides energy for a 1500m race?

A) ATP-CP B) Anaerobic C) Aerobic D) None of these

Answer: C) Aerobic

8.What helps in maintaining internal balance during exercise?

A) Digestive system B) Endocrine and immune systems

C) Skeletal system D) Reproductive system

Answer: B) Endocrine and immune systems

9.In the RICE method, “C” stands for:

A) Cold B) Care C) Compression D) Clean

Answer: C) Compression

10.Which fiber type gets tired quickly but contracts fast?

A) Slow Twitch B) Fast Twitch C) Elastic D) Mixed

Answer: B) Fast Twitch

11.Lactic acid is produced during:

A) Aerobic respiration B) Walking slowly

C) Anaerobic glycolysis D) Sleep

Answer: C) Anaerobic glycolysis

12.Strength depends largely on:

A) Lung capacity B) Myoglobin

C) Fast-twitch fibers D) Skin thickness

Answer: C) Fast-twitch fibers

13.The role of myoglobin in muscles is to:

A) Transport fat B) Produce energy

C) Store oxygen D) Remove waste

Answer: C) Store oxygen

14.Residual volume refers to:

A) Water in lungs B) Air left after exhalation

C) Maximum inhaled air D) Muscle energy

Answer: B) Air left after exhalation

15.Age-related muscle loss can be reduced by:

A) Medication B) Deep sleep

C) Regular physical activity D) High sugar intake

Answer: C) Regular physical activity

UNSOLVED QUESTIONS & ANSWERS

16.The component of fitness improved by aerobic training is:

A) Speed B) Flexibility C) Endurance D) Power

17.Which is the part of the cardiorespiratory system that pumps blood?

A) Lungs B) Veins C) Heart D) Capillaries

18.The soft tissue injury involving torn ligaments is:

A) Strain B) Sprain C) Contusion D) Fracture

19.Dislocation occurs when:

A) Muscle swells B) Bones break

C) Bones shift from joints D) Tendons stretch

20.The aerobic system uses energy from:

A) Lactic acid B) ATP C) Glucose and fats D) None

2 MARKS- Very Short Answer Questions : (Each answer within 60–90 words)

1. Define exercise physiology and its importance.

Answer : Exercise physiology is the study of how the human body responds and adapts to physical activity. It helps us understand how muscles, heart, lungs, and energy systems work together during exercise. This knowledge improves training, prevents injuries, and promotes overall health. It is essential for athletes, fitness enthusiasts, and even for healthy aging.

2. What are slow-twitch muscle fibers?

Answer : Slow-twitch fibers (Type I) are red-colored muscle fibers that work with oxygen (aerobiC). They contract slowly but are fatigue-resistant, making them ideal for endurance activities like marathon running and swimming. They support long-duration, low-intensity efforts.

3. What is VO_2 Max?

Answer : VO_2 Max is the maximum amount of oxygen your body can utilize during intense physical activity. It is an indicator of aerobic fitness and endurance. Higher VO_2 Max means better stamina and performance in sports like running or cycling.

4. Name the three energy systems.

Answer : The three energy systems are:

i. ATP-CP system (for quick bursts)
ii. Anaerobic system (for short-term effort without oxygen)
iii. Aerobic system (for long-duration effort using oxygen)

5. What is muscle hypertrophy?

Answer : Muscle hypertrophy refers to the increase in muscle size due to regular strength training. It results from the repair of micro-tears in muscle fibers after workouts, making muscles stronger and bigger.

6. Define cardiac output.

Answer : Cardiac output is the total volume of blood the heart pumps per minute. It is calculated by multiplying heart rate by stroke volume. It increases during exercise to deliver more oxygen to the muscles.

7. What is a sprain?

Answer : A sprain is a soft tissue injury involving the stretching or tearing of ligaments at a joint. It is commonly caused by a sudden twist or impact during physical activity.

8. Name two soft tissue injuries.

Answer : Two soft tissue injuries are:

Strain – a tear in muscles or tendons

Abrasion – a scraped layer of skin

9. What are fast-twitch fibers used for?

Answer : Fast-twitch fibers (Type II) contract quickly and provide powerful movements. They are used in high-intensity, short-duration sports like sprints, jumps, and weightlifting. However, they get tired quickly.

10. Mention one benefit of the RICE method.

Answer : The RICE method (Rest, Ice, Compression, Elevation) helps reduce swelling, pain, and promotes healing in soft tissue injuries like sprains and strains.

11. State two effects of exercise on the respiratory system.
12. How does age affect muscular strength?

13. What happens to bone mass after the age of 60?

14. What is an abrasion injury?

15. What is the aerobic energy system?

3 MARKS Short Answer Questions (Each answer within 100–150 words)

1. Explain the differences between slow-twitch and fast-twitch muscle fibers.

Answer : Slow-twitch fibers (Type I) are red in color due to high oxygen supply and are best suited for endurance activities. They contract slowly but do not get tired easily, making them ideal for long-distance sports like marathon running and swimming. Fast-twitch fibers (Type II) are white, contract quickly, and produce powerful movements. However, they fatigue rapidly. These fibers are used in activities like sprinting, weightlifting, and high jumps. While slow-twitch fibers rely on the aerobic energy system, fast-twitch fibers work mostly under anaerobic conditions. Athletes train based on their sport's requirement—endurance athletes focus on slow-twitch, while power athletes depend on fast-twitch.

2. Describe the ATP-CP energy system and give two examples where it is used.

Answer : The ATP-CP energy system provides immediate energy for high-intensity, short-duration activities lasting up to 10 seconds. It uses stored **ATP** *(adenosine triphosphate*) and *creatine phosphate* (**CP**) in muscles. This system does not require oxygen and is ideal for explosive efforts such as a 100m sprint or a shot put throw. It is the fastest way to supply energy but gets depleted quickly. Recovery of this system takes a few minutes of rest. Athletes doing power sports rely heavily on this system to perform at peak levels during quick movements.

3. What are the short-term effects of exercise on the muscular system?

Answer : Short-term effects on muscles occur during or right after exercise. These include increased blood flow, higher muscle temperature, and improved flexibility. Muscles may feel stiff or sore due to lactic acid buildup. Tiny micro-tears occur in the muscle fibers, especially during strength training. These tears are part of the muscle-building process. As a result, muscles temporarily lose strength and feel fatigued. However, these responses help the body adapt and become stronger when recovery and proper nutrition are provided after workouts.

4. State the long-term effects of regular exercise on the respiratory system.

Answer : With consistent aerobic training, the respiratory system adapts to become more efficient. Breathing muscles like the diaphragm get stronger, and the lungs increase their capacity to hold and move air. Gas exchange in the alveoli becomes faster and more effective. The breathing rate at rest decreases as each breath becomes deeper. Residual volume (the air left in lungs after exhalation) also increases. These adaptations allow more oxygen to enter the bloodstream and help athletes perform longer without fatigue.

5. How does training affect the cardiorespiratory system in the long term?

Answer : Long-term training strengthens the heart muscle, allowing it to pump more blood with fewer beats. This lowers resting heart rate and improves stroke volume and cardiac output. Blood vessels expand and increase in number, especially capillaries around muscles. The lungs increase their capacity, and breathing becomes deeper and more efficient. All these adaptations allow the body to deliver more oxygen and remove waste faster, improving stamina and performance in endurance sports.

6. List the types of fractures and briefly explain any three.

Answer : Types of fractures include:

- Stress fracture
- Greenstick fracture
- Comminuted fracture
- Transverse fracture
- Oblique fracture
- Impacted fracture

i. **Stress Fracture:** Tiny cracks from overuse, common in runners.
ii. **Greenstick Fracture**: Partial bending of bone, mostly in children.
iii. **Comminuted Fracture**: Bone breaks into multiple pieces, usually due to severe trauma.

7. Explain the role of the aerobic energy system in sports performance.

8. What is the RICE method? Explain its importance in sports injuries.

9. Explain the concept of cardiorespiratory endurance.

5 MARKS- Long Answer Questions (Each answer within 200–300 words)

1. Explain in detail the three energy systems of the human body with suitable examples.

Answer : The body uses three energy systems to supply **ATP *(adenosine triphosphate)*** during physical activity:

1. ATP-CP System (Phosphagen System):

Provides instant energy for high-intensity, short-duration activities (up to 10 seconds).

Uses stored ATP and creatine phosphate (CP).

No oxygen is used (anaerobiC).

Example: *100m sprint, shot put.*

2. Anaerobic Glycolytic System:

Active during moderate-duration, high-intensity efforts (10 sec–2 min).

Breaks down glucose without oxygen, producing lactic acid.

Example: *400m race, fast swimming.*

3. Aerobic System:

Supplies energy for long-duration, moderate-intensity activities.

Uses oxygen to convert carbohydrates and fats into ATP.

Example: *Marathon, football, cycling.*

2. Describe the short-term and long-term effects of exercise on the muscular system.

Answer : Short-Term Effects:

- Increased blood flow and muscle temperature
- More flexibility due to warmed-up muscles
- Lactic acid buildup causing fatigue
- Micro-tears in muscle fibers (leads to muscle soreness)

Long-Term Effects:

- Muscle hypertrophy – increase in muscle size and strength
- Strengthening of tendons and ligaments
- Increased number of mitochondria (better energy production)
- Higher levels of myoglobin and glycogen storage
- Improved metabolism and fat-burning ability
- Better lactate tolerance

3. What is aging? Explain how aging affects physical fitness.

Answer : Aging is a natural process where body functions decline over time. It begins noticeably after 40 and accelerates with age.

Muscular System:

- Muscle mass reduces (up to 50% by age 80)
- Strength and flexibility decline

Nervous System:

- Slower nerve impulses
- Poor coordination and reaction time

Cardiovascular System:

- Reduced cardiac output and blood flow
- Lower maximum heart rate

Respiratory System:

- Stiffer chest, lower lung capacity
- Slower breathing response

Skeletal System:

- Bone loss increases fracture risk
- Osteoporosis is common

Despite these, regular exercise can delay aging effects, improve health, and maintain independence in older adults.

4. Discuss the effects of exercise on the cardiovascular and respiratory systems in both short and long term.

5. Describe the different types of muscle fibers and how they influence athletic performance.

4 MARKS- Case Study Based Questions

1. Case Study

Priya is a sprinter training for the 100m race. Her coach is focusing on improving her reaction time and explosive power. She trains using short bursts of maximum effort exercises.

Q1. The primary energy system Priya uses during sprinting is the _____.

Q2. Which muscle fiber type will be dominant in her muscles?

Q3. True or False: Priya's activity uses the aerobic energy system.

Q4. Match the following:

A. Sprinting –	(i) Type I
B. Marathon –	(ii) Type II

Answers:

1. ATP-CP system
2. Fast-twitch
3. False
4. A–ii, B–i

2.Case Study

Ravi plays football regularly. He can run for long durations and recovers quickly after each match. His breathing remains steady even after 90 minutes of play.

Q1. Which energy system is mainly responsible for Ravi's performance?

Q2. True or False: Ravi has a strong aerobic capacity.

Q3. Fill in the blank: _____ fibers are responsible for Ravi's endurance.

Q4. Name any one cardiorespiratory adaptation Ravi would have.

Answers:

1. Aerobic system
2. True
3. Slow-twitch
4. Lower resting heart rate / Increased lung capacity

Case Study 3:

Sunita, a 65-year-old woman, finds it difficult to climb stairs. Her bones are weak, and she complains of joint pain. Her doctor suspects age-related bone degeneration.

Q1. Name the condition Sunita might be suffering from.

Q2. True or False: Flexibility increases with age.

Q3. Fill in the blank: Aging can cause up to _____% loss of muscle mass by age 80.

Q4. Match the systems with effects of aging:

A. Muscular –	(i) Lower lung capacity
B. Respiratory –	(ii) Muscle fiber loss

Answers:

1. Osteoporosis
2. False
3. 50
4. A–ii, B–i

Case Study 4:

Arjun slipped during a kabaddi match and twisted his ankle. His coach immediately applied the RICE method to treat the injury.

Q1. What type of injury has Arjun likely suffered?

Q2. What does "C" in RICE stand for?

Q3. True or False: A fracture is a soft tissue injury.

Q4. Fill in the blank: To stop further movement of the injured limb, the injured person should-----

Answers:

1. Sprain
2. Compression
3. False
4. Rest

Unsolved Questions

Case Study 5:

Reena is preparing for a yoga competition. Her focus is on joint movement and maintaining a full range of motion. She practices stretching daily.

Q1. Name the fitness component Reena is focusing on.

Q2. Fill in the blank: Flexibility depends on joint structure and _____.

Q3. True or False: Flexibility has no role in injury prevention.

Q4. Match the activities with the fitness component:

A. Yoga –	(i) Strength
B. Weightlifting –	(ii) Flexibility

Case Study 6:

Manav trains in the gym 5 days a week. He performs heavy lifting and aims to grow muscle size. He also takes a protein-rich diet.

Q1. What is the physiological term used to refer to muscle growth?

Q2. True or False: Lactic acid helps in muscle recovery.

Q3. Fill in the blank: Muscle growth results from _____ in fibers during training.

Q4. Match the terms:

A. Hypertrophy –	(i) Muscle soreness
B. Micro-tears –	(ii) Muscle enlargement

UNIT-8

BIOMECHANICS AND SPORTS

TOPICS:

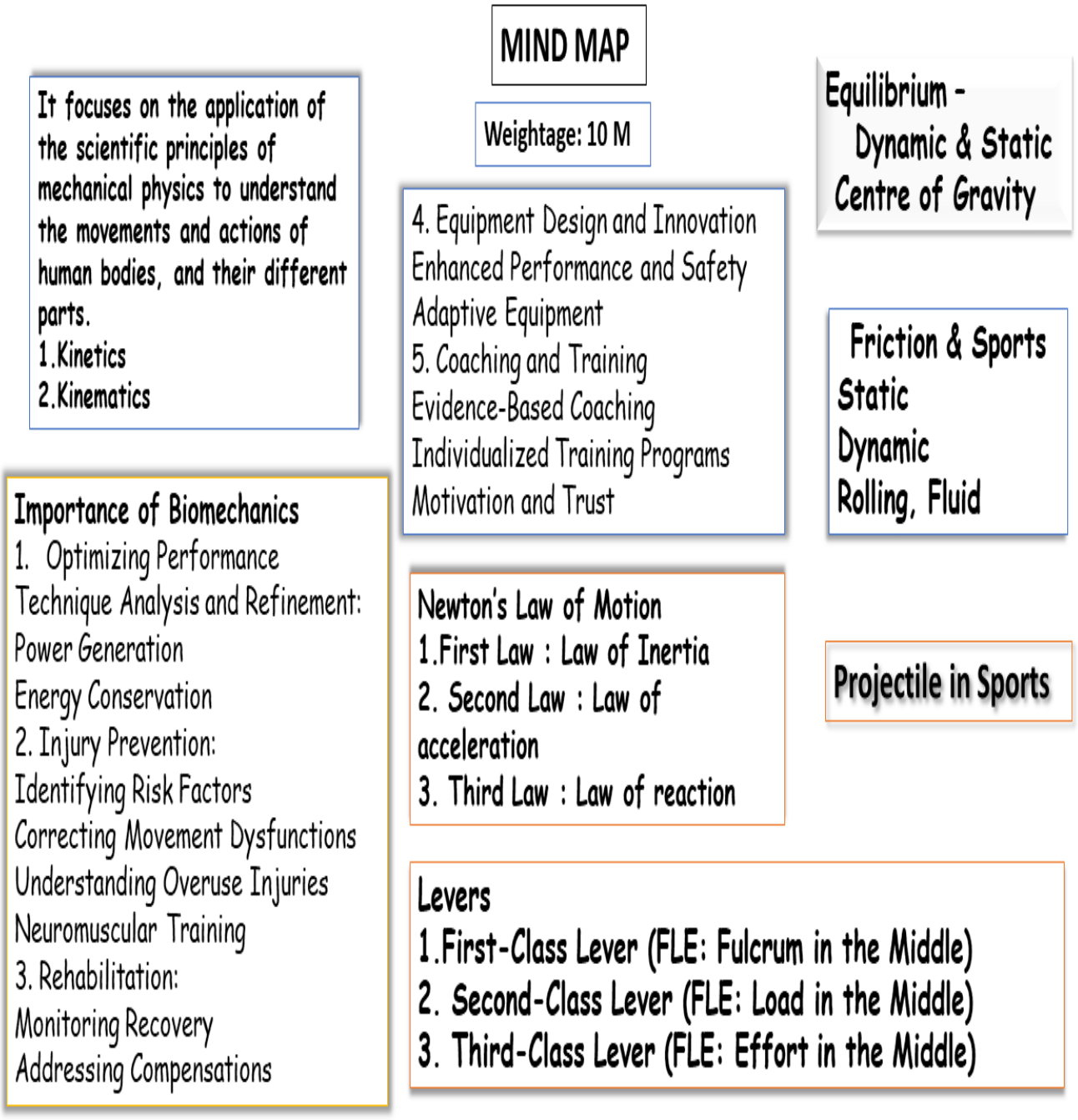
1. Newton's Law of Motion & its application in sports
2. Types of Levers and their application in Sports.
3. Equilibrium – Dynamic & Static and Centre of Gravity and its application in sports
4. Friction & Sports
5. Projectile in Sports

Specific learning objectives:

- To understand Newton's Laws of Motion and their Application in Sports.
- To enable the students to understand the lever and its application in sports.
- To enable the students to understand the concept of Equilibrium and its application in sports.
- To understand Friction in Sports.
- To understand the concept of Projectile in sports.

Learning Outcomes with specific Competencies:

- Understand Newton's Law of Motion and its application in sports
- Recognize the concept of Equilibrium and its application in sports.
- Know about the Centre of Gravity and will be able to apply it in sports
- Define Friction and application in sports.
- Understand the concept of Projectile in sports.



I. Introduction to Biomechanics

Definition: Biomechanics is the study of forces and their effects on living systems, particularly human movement. It combines principles of physics and engineering to analyze and understand how the human body moves in various activities, especially sports.

It seeks to understand *how* biological systems, from individual cells to entire organisms, move and function by analyzing the forces and their effects on these systems.

The term "biomechanics" itself is a combination of two Greek words:

- "**Bio**," meaning life.

- "**Mechanics**," the branch of physics concerned with the behaviour of physical bodies when subjected to forces or displacements, and the subsequent effects of these forces on their environment.

Importance of Biomechanics in Sports:

1. Optimizing Performance:

Technique Analysis and Refinement: Biomechanics allows for a detailed analysis of an athlete's movements, identifying inefficient patterns, wasted energy, and areas for improvement. By understanding the forces, angles, and timing involved, coaches can refine technique to maximize power, speed, accuracy, and efficiency.

"For example, analyzing a pitcher's throwing motion can pinpoint inefficiencies that prevent them from throwing faster or with greater accuracy. Similarly, in sports such as long jump and triple jump, biomechanical analysis can identify optimal take-off angles, body positions, and arm movements to achieve greater distances."

Power Generation: Biomechanics helps understand how muscles generate force and how to optimize body mechanics for maximum power output in movements like jumping, throwing, or striking.

Energy Conservation: By identifying and correcting inefficient movements, biomechanics can help athletes conserve energy, allowing them to perform at a high level for longer periods.

2. Injury Prevention:

Identifying Risk Factors: Biomechanical assessments can pinpoint movement patterns that predispose athletes to injuries. For instance, analyzing landing mechanics in basketball players can identify inadequate techniques that increase the risk of knee injuries (e.g., ACL tears).

Correcting Movement Dysfunctions: Once risk factors are identified, targeted training interventions can be designed to correct biomechanical deficits and improve movement quality, thereby reducing injury incidence.

Understanding Overuse Injuries: Many overuse injuries are linked to repetitive stress and improper mechanics. Biomechanics helps understand these factors and develop strategies like modifying training techniques or improving equipment to prevent them.

Neuromuscular Training: Biomechanics informs neuromuscular training protocols that focus on improving balance, coordination, strength, and power, which are crucial for injury prevention.

3. Rehabilitation:

Monitoring Recovery: Biomechanics helps in monitoring the recovery process after an injury, allowing therapists to track changes in movement patterns and ensure a safe and effective return to sport.

Addressing Compensations: After an injury, athletes may develop compensatory movement patterns. Biomechanics helps identify and correct these to prevent further issues.

4. Equipment Design and Innovation:

Enhanced Performance and Safety: Biomechanics is crucial in the design and development of athletic footwear, apparel, and protective equipment.

For example, biomechanical analysis of running shoes can help develop products that enhance running economy, absorb impact better, or provide optimal stability.

Adaptive Equipment: It also plays a role in the development of prosthetics and adaptive equipment for athletes with disabilities.

5. Coaching and Training:

Evidence-Based Coaching: Biomechanics provides coaches with objective, data-driven insights into an athlete's movement, moving beyond intuition to provide more precise and effective instruction.

Individualized Training Programs: By understanding an athlete's unique biomechanics, coaches can design individualized training programs that cater to their specific needs and optimize their development.

Motivation and Trust: Visual feedback and quantitative data from biomechanical assessments can help athletes understand where they stand, what they need to work on, and build trust in the coaching process.

Kinetics and Kinematics

Biomechanics, the study of forces and their effects on living systems, is broadly divided into two main areas **Kinetics and Kinematics**. While both deal with motion, they focus on different aspects.

Kinetics:

Kinetics is the branch of biomechanics that studies the forces that cause or tend to cause changes in motion. It focuses on the "why" of motion.

"Study of forces that cause or result from motion."

Key elements**:**

Ground reaction forces
Joint moments and torques
Muscle forces
External loads

Kinematics is the branch of biomechanics that describes motion without considering the forces that cause that motion. It focuses on the "geometry of motion" or "how" an object moves in terms of its position, velocity, and acceleration.

"Study of motion without regard to the forces that cause it"

Key elements:

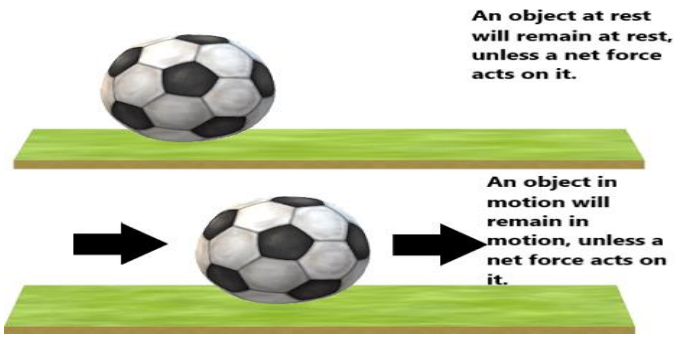
Displacement
Velocity
Acceleration
Joint angles

7.1. Newton's Laws of Motion and Their Application in Sports

Sir Isaac Newton's three laws of motion are fundamental to understanding movement in sports.

7.1.1 Law of Inertia (First Law):

Statement: A body at rest will remain at rest, and a body in motion will remain in motion at the same speed and in the same direction unless acted upon by an external force.



Application in Sports:

1. Soccer/Football:

A stationary ball: A soccer ball sitting on the field will not move until a player kicks it (an unbalanced force). This is inertia of rest.

A kicked ball: Once a ball is kicked, it will continue to roll or fly in a straight line at a relatively constant speed until friction, air resistance, or another player/object applies a force to stop or change its direction. This is inertia of motion.

2. Basketball:

Shooting a free throw: The basketball stays in your hands (inertia of rest) until you apply a force to shoot it. Once released, it continues on its trajectory towards the hoop (inertia of motion) until gravity pulls it down or it hits the rim/backboard.

Changing direction rapidly (crossover dribble): A player dribbling down the court has forward inertia. To change direction quickly (e.g., a crossover dribble), they need to apply a strong force with their feet against the ground to overcome their forward inertia and propel themselves in a new direction.

3. Track and Field:

Sprinting: A sprinter at the starting blocks will remain at rest until they apply force to the ground to start moving.

Shot Put/Discus/Javelin: The athlete builds up momentum in the throwing implement. Once released, the implement continues its flight path due to inertia until gravity and air resistance bring it to the ground.

Long Jump/Triple Jump: After the take-off, the jumper's body continues its horizontal motion due to inertia, allowing them to cover a significant distance.

7.1.2. Law of Acceleration (Second Law):

The acceleration of an object is directly proportional to the net force applied to it and inversely proportional to its mass

F=ma

Application in Sports:

1. Sprinting (Track and FielD):

Applying Force to Accelerate: A sprinter's primary goal at the start of a race is to accelerate as quickly as possible. To do this, they apply a large force against the starting blocks and the ground. The greater the force they can exert for their body mass, the greater their acceleration.

2. Throwing Events (Shot Put, Discus, Javelin, Baseball Pitching):

Maximizing Force for Acceleration: In throwing sports, athletes aim to impart the maximum possible acceleration to the implement (shot, discus, javelin, ball). Since the mass of the implement is constant, the only way to increase its acceleration (and thus its final velocity) is to apply a greater force over a longer distance (the wind-up and release phase).

3. Kicking a Ball (Soccer, Football, Rugby):

Force and Ball Speed: When a player kicks a soccer ball, the force applied by their foot directly determines the ball's acceleration. A harder kick (more force) will result in greater acceleration, sending the ball faster and potentially further.

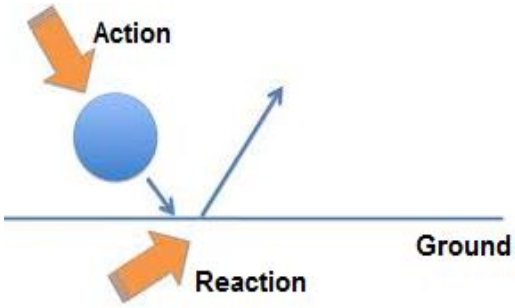
4. Weightlifting:

Lifting and Accelerating: When a weightlifter lifts a barbell, they must apply a force greater than the force of gravity acting on the barbell to cause it to accelerate upwards.

In summary, Newton's Second Law provides a quantitative framework for understanding how athletes generate and apply force to achieve desired changes in motion, whether it's accelerating their own bodies, throwing an object, or hitting a ball. Coaches and sports scientists use this law to analyze performance, identify areas for improvement, and design more effective training programs.

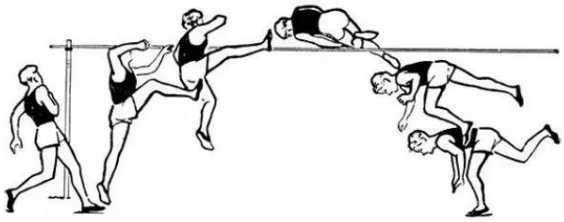
7.1.3. Law of Reaction (Third Law):

"For every action, there is an equal and opposite reaction."



Application in Sports:

Jumping: When a high jumper pushes down on the ground (action), the ground pushes back with an equal and opposite force (reaction), propelling the jumper upwards.



Swimming: A swimmer pushes water backward with their hands and feet (action), and the water pushes the swimmer forward (reaction).

Running: As a runner's foot pushes back against the track (action), the track pushes forward on the foot (reaction), allowing the runner to move forward.

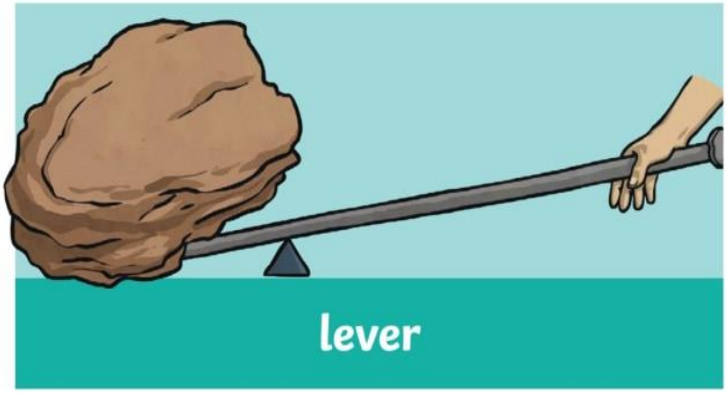
Cl

Shooting: When a gun is fired, the bullet moves forward (action), and the gun recoils backward (reaction).

7.2 Levers

I. Introduction to Levers

A lever is a rigid bar that rotates around a fixed point called a fulcrum. In the human body, bones act as rigid bars, joints act as fulcrums, and muscles provide the effort (force) to move a load (resistance).



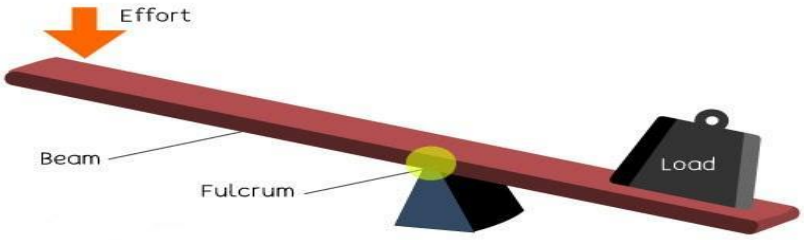
Components of a Lever System:

Fulcrum (F): The fixed point around which the lever rotates. In the human body, this is typically a joint.

Load (L) / Resistance (R): The weight or resistance that needs to be moved. This can be a body part, an external object (e.g., a dumbbell, a ball), or the tension from an opposing muscle.

Effort (E) / Force (F): The muscular force applied to move the load. This is generated by muscle contraction at its insertion point on the bone.

Lever Arm: The rigid bar itself (the bone).



Purpose of Levers in the Body:

- To magnify force (mechanical advantage).
- To increase the speed of movement.
- To increase the range of motion.
- To change the direction of force.

7.2.1 Classes of Levers

Levers are classified based on the relative positions of the fulcrum (F), load (L), and effort (E). A useful mnemonic is "F-L-E" for 1-2-3, indicating the middle component of each class.

1. First-Class Lever (FLE: Fulcrum in the Middle)

The fulcrum (F) is located between the effort (E) and the load (L).

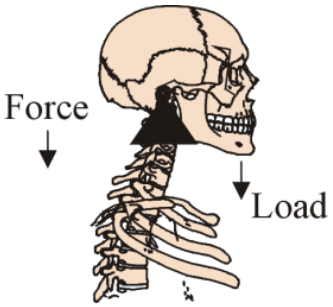
Mechanical Advantage: Can be either high or low, or even balanced, depending on the relative lengths of the effort arm and the load arm.

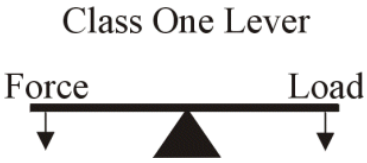
If the effort arm (distance from fulcrum to effort) is longer than the load arm (distance from fulcrum to loaD), it has mechanical advantage (less effort for more loaD).

If the effort arm is shorter than the load arm, it favours speed and range of motion over force.

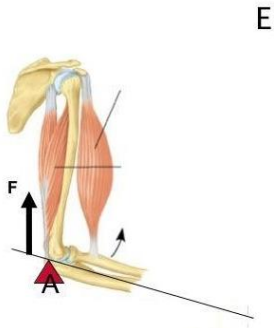
Application in the Human Body & Sports:

Nodding the head: The fulcrum is the atlanto-occipital joint (where the skull meets the spine), the load is the weight of the head, and the effort is provided by the posterior neck muscles (e.g., splenius capitis) to lift the head, or anterior neck muscles to lower it. This is a classic example.





Triceps extension (e.g., pushing off in a push-up): The fulcrum is the elbow joint, the effort is the triceps muscle, and the load is the weight of the forearm, hand, and any external resistance (e.g., body weight in a push-up).



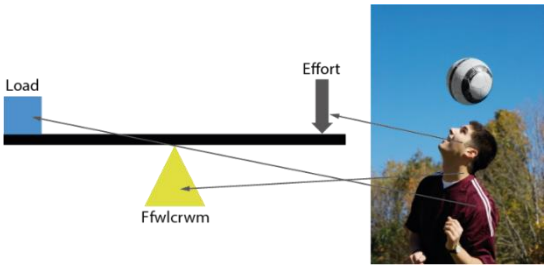
Examples in sports:

Heading a football (neck action).

Fulcrum: The neck joint (atlanto-occipital joint)

Effort: The muscles in the back of the neck (e.g., erector spinae)

Load: The weight of the head and the football

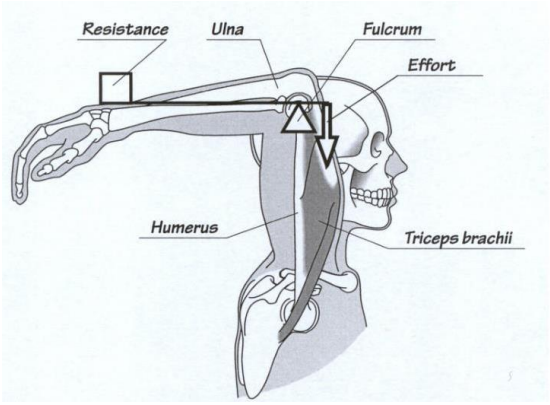


Extension phase of a punch or a tennis serve (triceps at the elbow).

Fulcrum: The elbow joint

Effort: The triceps muscle (pulling on the olecranon process of the ulnA)

Load: The forearm, hand, and any object being held (e.g., a rugby ball, tennis racket)

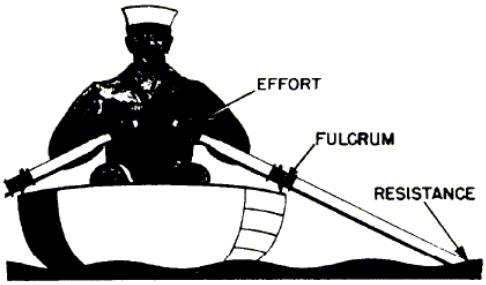


Rowing:

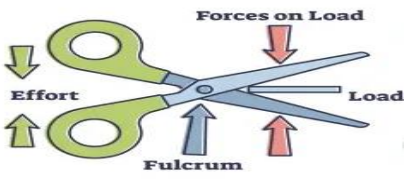
Fulcrum: The oarlocks (where the oar pivots on the boat)

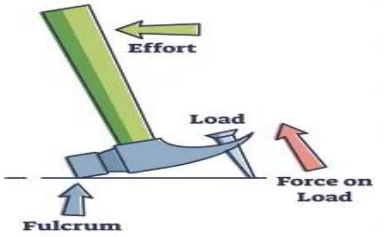
Effort: The rower's hands pulling on the oar handle

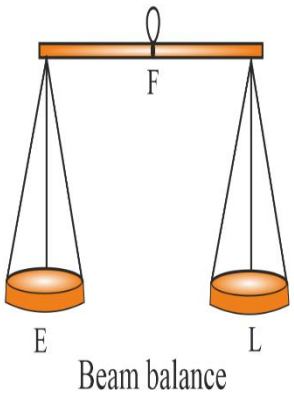
Load: The water resisting the oar blade

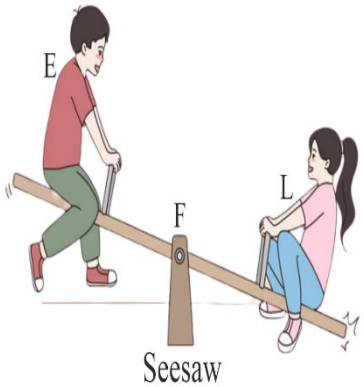


Analogy: A seesaw, crowbar, or a pair of scissors.









7.2.2 Second-Class Lever (FLE: Load in the Middle)

The load (L) is located between the fulcrum (F) and the effort (E).

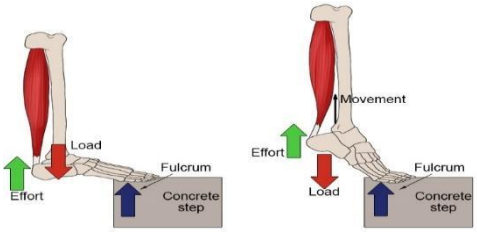
Mechanical Advantage: Always provides a mechanical advantage because the effort arm (distance from fulcrum to effort) is always longer than the load arm (distance from fulcrum to loaD). This means a small effort can move a large load, but over a shorter range of motion and with less speed.

Application in the Human Body & Sports:

Plantar flexion (standing on tip of toes): The fulcrum is the ball of the foot (metatarsophalangeal joints), the load is the body's weight passing through the ankle, and the effort is provided by the calf muscles (gastrocnemius and soleus) pulling on the heel.

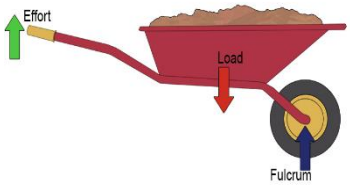
Examples in sports:

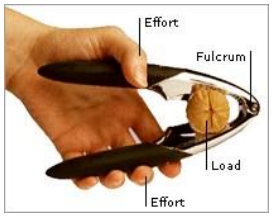
Taking off for a jump: The powerful push-off from the ankles utilizes a second-class lever.

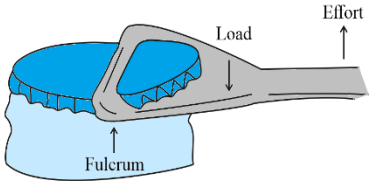


Wheelbarrowing in gymnastics/partner activities: The feet act as the fulcrum, body weight is the load, and the hands provide effort.

Analogy: A wheelbarrow, nutcracker, or a bottle opener.







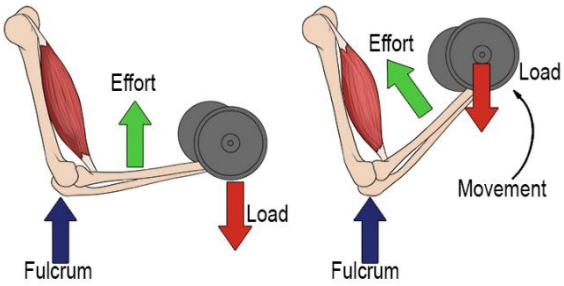
7.2.3. Third-Class Lever (FLE: Effort in the Middle)

The effort (E) is located between the fulcrum (F) and the load (L).

Mechanical Advantage: Always operates at a mechanical disadvantage because the effort arm (distance from fulcrum to effort) is always shorter than the load arm (distance from fulcrum to loaD). This means a large effort is required to move a relatively smaller load, but it allows for a greater range of motion and speed at the load end. This is the most common type of lever in the human body.

Application in the Human Body & Sports:

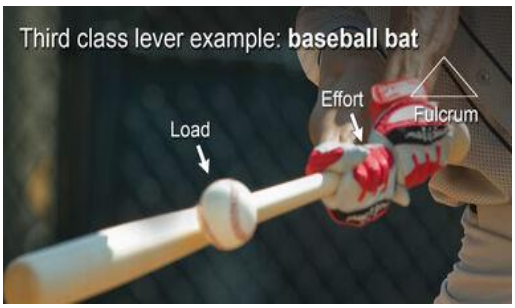
Bicep curl (flexing the elbow): The fulcrum is the elbow joint, the effort is the biceps muscle (inserting close to the elbow), and the load is the weight of the forearm, hand, and any dumbbell.



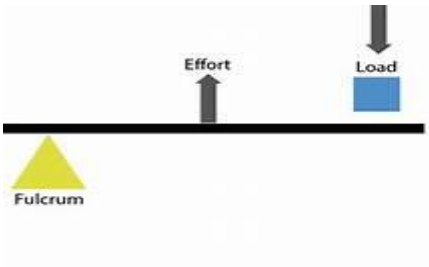
Knee flexion (e.g., hamstring curl): The fulcrum is the knee joint, the effort is the hamstring muscles, and the load is the lower leg and foot.

Examples in sports:

Throwing events (e.g., javelin, baseball pitch): The arm acts as a third-class lever, allowing for a large range of motion and high speed at the hand, despite requiring significant muscular effort.



Kicking a football: The leg (especially the lower leg) acts as a third-class lever during the swing phase, generating high speed at the foot.



Analogy: A fishing rod, shovel, or a pair of tweezers.

7.3.1 Equilibrium

Equilibrium refers to a state where the sum of all forces and torques acting on a body is zero, so the body remains at rest or moves with constant velocity.

Equilibrium refers to a state of balance where all forces and torques acting on an athlete's body are balanced, allowing for stability and control.

This concept is absolutely critical for performance, injury prevention, and the execution of skilled movements across virtually every sport.

Types of Equilibrium in Sports:

There are two primary types of equilibrium relevant to sports:

Static Equilibrium:

Definition: This is a state of balance when an athlete's body is at rest or in a stationary position. The net force and net torque acting on the body are both zero.

Purpose: To maintain a stable posture, to prepare for an action, or to hold a position. It's about resisting any tendency to move or fall.

Examples in Sports:

- A gymnast holding a handstand or a balanced pose on a beam before beginning their routine.
- A shot-putter holding the shot at their neck just before initiating the throw.
- An archer aiming before releasing an arrow.
- A weightlifter holding a barbell overhead after a successful lift.
- A goalkeeper in a ready stance before a shot.

Dynamic Equilibrium:

Definition: This is a state of balance when an athlete's body is in motion, but moving with a constant velocity (meaning no acceleration). While forces are acting, they are balanced, preventing a change in speed or direction.

Purpose: To maintain control and stability while performing movements, changing direction, or accelerating/decelerating. It requires continuous adjustments.

Application in Sports:

- A sprinter running at a constant speed on a straight track (before accelerating or decelerating).
- A cyclist riding in a straight line at a steady pace.
- A gymnast performing a routine on a balance beam where he is constantly adjusting his body to stay on.
- A soccer player dribbling the ball while moving across the field.
- A skier gliding down a gentle slope at a consistent speed.
- A figure skater performing a continuous spin.

Importance and Role of Equilibrium in Athletic Performance:

A. Execution of Skills: Many complex movements require precise balance.

For example, a basketball player needs dynamic equilibrium to drive to the basket and shoot, and a tennis player needs it to hit a powerful forehand while moving.

B. Injury Prevention: Poor balance significantly increases the risk of falls, sprains (especially ankle sprains), and other musculoskeletal injuries. Balance training is a common component of injury prevention programs.

C. Efficiency of Movement: When an athlete is in good equilibrium, their movements are more efficient, requiring less energy to maintain stability and allowing more energy to be directed towards the intended action (e.g., throwing, jumping, hitting).

D. Power and Force Generation: A stable base allows for greater force production. Think of a baseball pitcher needing to brace their body to transfer power from their legs to their arm.

E. Agility and Change of Direction: The ability to quickly shift weight and re-establish balance is crucial for changing direction rapidly, a key component of many invasion sports.

F. Confidence: Athletes who feel stable and balanced are more confident in executing challenging movements.

7.3.2 Centre of Gravity (COG):

The **Centre of Gravity (COG)**, also known as the **Centre of Mass (COM)**,

The **Centre of Gravity (COG)** is the imaginary point at which the entire weight of an object. It's the point where the sum of all forces and torques due to gravity acting on the object is effectively zero.

Importance and Role of The Centre of Gravity (COG) in Sports

The Centre of Gravity (COG) is a critical biomechanical concept in sports, influencing nearly every aspect of an athlete's performance, from basic stability to complex, explosive movements. Its importance stems from its direct relationship with balance, stability, and the ability to generate and control force.

1. Fundamental for Balance and Stability:

Maintaining Static Balance: In sports, many actions begin or end in a static, balanced position (e.g., a gymnast holding a pose, a weightlifter standing still with a barbell overheaD). For static balance, the line of gravity (an imaginary vertical line passing through the COG) must fall within the athlete's base of support (BOS). A lower COG and a wider Base increase static stability.

Controlling Dynamic Balance: Most sports involve movement, meaning balance must be maintained while the body is in motion (dynamic equilibrium). Athletes constantly adjust their body segments to

keep their COG within their changing Base. This is crucial for running, dribbling, cutting, turning, and performing any moving skill without falling.

Injury Prevention: Poor control of the COG and inadequate balance significantly increase the risk of falls, sprains (especially ankle and knee), and other musculoskeletal injuries. Athletes with better COG control are less likely to be thrown off balance and are better equipped to absorb forces safely.

2. Enhancing Agility and Quickness:

Rapid Change of Direction: Sports like basketball, soccer, and tennis demand constant changes in direction. Athletes need to quickly shift their COG to accelerate, decelerate, and pivot. The ability to efficiently move the COG from one side of the Base to the other allows for quick cuts.

Reacting to Opponents/Situations: A well-controlled COG enables athletes to respond rapidly to changing game situations or opponents' movements, giving them a competitive edge.

3. Technique Optimization:

Sport-Specific Positioning: Every sport has optimal body positions that align the COG for maximal performance. Coaches often use cues related to COG (e.g., "get low," "lean into it," "stay over your feet") to help athletes refine their technique.

Unique Techniques: Some sports involve highly specialized techniques that intentionally manipulate the COG in counterintuitive ways for a performance advantage. The Fosbury Flop in high jump is the classic example, where the athlete's COG actually passes below the bar, allowing them to clear greater heights.

Spin and Rotation: For movements involving rotation (e.g., dives, twists in gymnastics, figure skating spins), understanding the COG is critical. The body rotates around its COG when airborne. Manipulation of limb positions relative to the COG changes the moment of inertia, affecting the speed of rotation.

4. Tactical Advantage:

Offensive Movements: In contact sports, athletes can use their COG to their advantage, for example, by lowering their COG and driving through an opponent to gain ground or make a tackle.

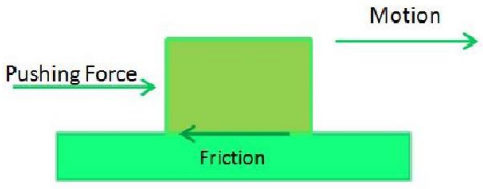
Defensive Stability: Conversely, a strong understanding of COG allows athletes to increase their stability to resist forces from opponents, making them harder to push, pull, or tackle.

7.4 Friction

Friction: A force that opposes the relative motion or tendency of motion between two surfaces in contact.

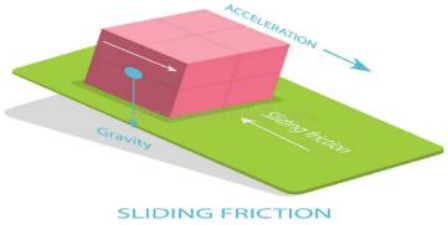
Types of Friction:

Static Friction: The friction that prevents an object from moving when a force is applied. It acts when surfaces are at rest relative to each other.

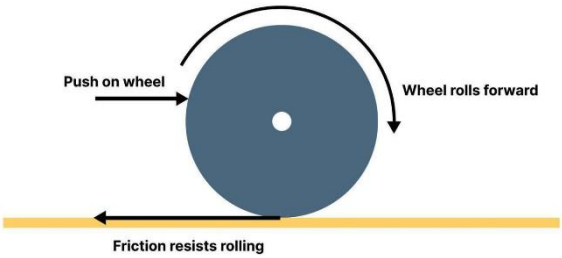


Dynamic (KinetiC) Friction: The friction that opposes the motion of an object once it is already moving.

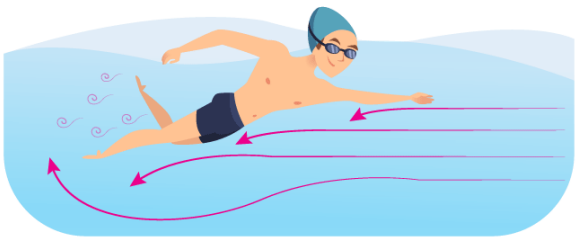
Sliding Friction: When one object slides over another (e.g., a hockey puck sliding on ice).



Rolling Friction: When an object rolls over a surface (e.g., a bowling ball rolling on a lane, a football rolling).



Fluid Friction (Air/Water Resistance): Resistance experienced by objects moving through a fluid (air or water).



Application in Sports:

Beneficial Friction:

Grip: Friction between shoes and the playing surface is essential for running, stopping, and changing direction (e.g., spikes in athletic shoes, rubber soles).

Holding Equipment: Friction between hands and equipment (e.g., chalk in gymnastics, sticky grips on racquets) provides a secure hold.

Braking: Friction is crucial for braking in cycling or stopping in various sports.

Undesirable Friction:

Air Resistance: Can slow down projectiles or athletes.

Sliding on Ice: Less friction is desired for sports like ice skating or curling to allow for gliding.

Controlling Friction: Athletes and equipment designers manipulate friction to their advantage (e.g., waxing skis to reduce friction, using specialized tires in racing).

7.5 Projectile

Projectile: Any object that is projected into the air and is acted upon only by the forces of gravity and air resistance.

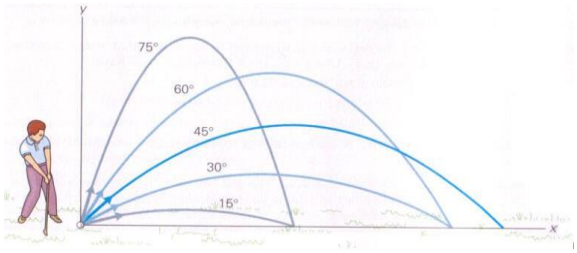
Examples : a shot put, a basketball, a javelin, or even an athlete during a long jump.

Projectile Trajectory: The path followed by a projectile. This path is typically parabolic (curveD).

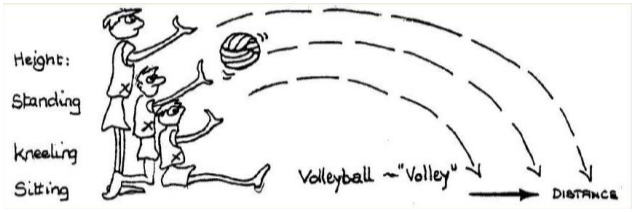
Factors Affecting Projectile Trajectory:

Speed of Release (Initial Velocity): The faster an object is thrown or projected, the farther it will travel (assuming optimal angle and height).

Angle of Release: For maximum horizontal distance, an angle of 45 degrees is generally considered optimal in a vacuum.



Height of Release: The higher the point of release, the greater the distance a projectile can travel, assuming other factors are constant. This is why taller athletes often have an advantage in throwing events.



Gravity: Constant downward force that pulls the projectile towards the earth.

Air Resistance (Drag): A force that opposes the motion of the object through the air. Its effect depends on the object's shape, size, and speed. Aerodynamic shapes reduce air resistance.

1. MULTIPLE CHOICE QUESTIONS (1 MARKS)

1. Biomechanics is the study of:
A) Anatomy B) Muscles C) Forces and movement in living systems D) Nervous system
Answer: c

2. Which law of motion is also called the "Law of Inertia"?
A) Second Law B) First Law C) Third Law D) Fourth Law
Answer: b

3. The equation F = ma represents:
A) Law of Inertia B) Law of Gravity
C) Law of Acceleration D) Law of Friction
Answer: c

4. When a footballer kicks a ball, which Newton's law is applied?
A) First B) Second C) Third D) Both 1 and 2
Answer: d

5. In which type of lever is the load located between the effort and fulcrum?
A) First-class B) Second-class
C) Third-class D) Fourth-class
Answer: b

6. Which of the following is an example of a first-class lever in the human body?
A) Bicep curl B) Standing on toes
C) Nodding the head D) Kicking a ball
Answer: c

7. Dynamic equilibrium occurs when:
A) The body is at rest B) The body is not moving
C) The body is moving with constant velocity D) The body has no mass
Answer: c

8. Which factor affects projectile motion the most?
A) Temperature B) Distance C) Air pressure D) Angle of release
Answer: d

9. What is the main purpose of using biomechanics in sports?
A) Only to prevent injury B) To build muscles
C) To optimize performance and prevent injury D) Only to understand muscles
Answer: c

10. Which type of friction helps a footballer change direction quickly?
A) Static friction B) Fluid friction
C) Rolling friction D) Kinetic friction
Answer: a

11. Kinetics is related to:
A) Only movements B) Joint angles
C) Forces causing motion D) Visual learning
Answer: c

12. Centre of Gravity is important because:
A) It reduces weight B) It improves skin tone
C) It helps in balance and control D) None of the above
Answer: c

13. Which sport best demonstrates the third law of motion?
A) Golf B) Swimming C) Darts D) Archery
Answer: b

14. In biomechanics, "E" in the lever system stands for:
A) Energy B) Edge C) Effort D) Equilibrium
Answer: c

15. When a sprinter pushes off starting blocks, which Newton's law is used?
A) First B) Second C) Third D) Fourth
Answer: b

UNSOLVED QUESTION ANSWER

16. Which type of lever is most common in the human body?

A) First B) Second C) Third D) Fourth

17. In a bicep curl, which part acts as the fulcrum?

A) Elbow B) Shoulder C) Wrist D) Finger

18. Which of the following is NOT a type of friction?

A) Static B) Rolling C) Twisting D) Sliding

19. The trajectory of a projectile is typically:

A) Straight line B) Vertical C) Parabolic D) Zig-zag

20. Air resistance is an example of:

A) Static friction B) Fluid friction

C) Rolling friction D) None

2. VERY SHORT ANSWER QUESTIONS (2 Marks, 60–90 words)

1. Define biomechanics and its main focus in sports.

Answer: Biomechanics is the study of forces and their effects on living systems, especially human movement. It helps understand motion, improve performance, and prevent injury in sports.

2. What is Newton's First Law of Motion? Give one sports example.

Answer: It states a body remains at rest or in motion unless acted on by external force. Example: A football stays still until kicked.

3. State Newton's Second Law with a sports-related example.

Answer: The law states F = ma (Force = mass × acceleration). In sprinting, more force results in faster acceleration.

4. Explain Newton's Third Law using a jumping athlete.

Answer: When an athlete pushes the ground downward, the ground reacts with equal upward force, enabling the jump.

5. Define a lever and name its three components.

Answer: A lever is a rigid bar that rotates around a fulcrum. Its three parts are: Fulcrum, Load, and Effort.

6. Give two examples of first-class levers in sports.

Answer: Nodding the head in football and elbow extension during a punch are examples of first-class levers.

7. What is static equilibrium? Give one example from sports.

Answer: Static equilibrium occurs when the body is at rest with balanced forces. Example: A gymnast holding a handstand.

8. Differentiate between static and dynamic equilibrium.

Answer: Static equilibrium is balance at rest; dynamic equilibrium is balance while moving with constant velocity.

9. What is the Centre of Gravity and why is it important in sports?

Answer: It is the point where the body mass is centered. It helps athletes maintain balance and control in movement.

10. Explain one example where low COG benefits performance.

Answer: A wrestler with a low COG resists being toppled easily, enhancing stability and defense.

UNSOLVED QUESTION

11. What is friction? State any two types used in sports.

12. Give two examples where friction is desirable in sports.

13. Define projectile. Give two examples from sports.

14. Name two factors that affect projectile trajectory.

15. What is kinematics and how is it different from kinetics?

3. SHORT ANSWER QUESTIONS (3 Marks, 100–150 words)

1. Describe the three laws of motion with one example for each from sports.

Answer: 1st Law (InertiA): A soccer ball stays still until kicked. 2nd Law (F=mA): More force leads to faster sprint starts. 3rd Law (Action-Reaction): A swimmer pushes water back, and moves forward.

2. Explain all three classes of levers with diagrams and sports examples.

Answer: 1st Class: Fulcrum in middle (nodding heaD). 2nd Class: Load in middle (standing on toes). 3rd Class: Effort in middle (bicep curl). Most levers in the body are 3rd class.

3. Write a note on the importance of equilibrium in sports performance.

Answer: Equilibrium helps the athletes maintain their posture and balance. Static equilibrium helps in still positions like archery, while dynamic equilibrium aids movement control, like dribbling in basketball.

4. How does Centre of Gravity affect performance and injury prevention?

Answer: Lower COG increases balance and reduces risk of falls. Athletes with better COG control perform better and avoid injuries in dynamic movements.

5. Write the difference between static and dynamic friction. Give one example each.

Answer: Static friction prevents motion (e.g., standing start in sprint), while dynamic friction opposes movement (e.g., ice hockey puck).

6. How does biomechanics help in injury prevention?

Answer: Biomechanics identifies poor movement patterns and corrects them through targeted training, reducing injury risk, especially overuse injuries.

UNSOLVED QUESTION

7. What is the role of biomechanics in equipment design?

8. Describe the factors affecting projectile motion in sports.

9. Compare kinematics and kinetics with definitions and examples.

4. CASE STUDY BASED QUESTIONS (4 Marks Each)

Case Study 1: Levers in Sports

Read the case: A footballer is performing a bicep curl during strength training.

A) Fill in the blank: The _____ joint acts as the fulcrum.

B) True or False: This is an example of a first-class lever.

C) Match the component with body part:

Fulcrum → Elbow

Effort → Biceps

D) Name the class of lever demonstrated here.

Case Study 2: Friction

In a football match, players wear studs.

A) Fill in the blank: Studs increase _____ friction.

B) True or False: Fluid friction is most useful in this case.

C) Match:

Static Friction → Starting movement

Sliding Friction → Hockey puck on ice

Rolling Friction → Bowling ball

D) Name one sport where low friction is beneficial.

Case Study 3: Projectiles

A Javelin thrower releases the Javelin at 45°.

A) Fill in the blank: The optimal angle of release is _____ degrees.

B) True or False: Speed of release does not affect the range.

C) Match:

Speed of release → Affects distance

Gravity → Pulls object down

Air resistance → Opposes motion

D) Why does a taller athlete usually have an advantage?

Case Study 4: Centre of Gravity

A basketball player lowers body while defending.

A) Fill in the blank: A _____ COG increases stability.

B) True or False: Narrow base helps maintain balance.

C) Match:

Low COG → High stability

Wide base → Better balance

Line of Gravity inside base → Stable position

D) Why is controlling COG important in invasion sports?

UNSOLVED QUESTION

Case Study 5: Newton's Laws

During sprinting, athletes push hard against the ground.

A) Fill in the blank: According to Newton's Third Law, the ground pushes _____ on the athlete.

B) True or False: Law of Inertia applies during sprint start.

C) Match:

Law of Inertia → Motion without force

Law of Acceleration → F = ma

Law of Reaction → Equal and opposite force

D) Which law explains the acceleration during take-off?

Case Study 3: Equilibrium

A gymnast holds a handstand position.

A) Fill in the blank: This is an example of _____ equilibrium.

B) True or False: The gymnast is in motion during handstand.

C) Match:

Static Equilibrium → Handstand

Dynamic Equilibrium → Cycling at constant speed

No Equilibrium → Falling athlete

D) Why is low Centre of Gravity important in such activities?

5. LONG ANSWER QUESTIONS (5 Marks, 150–200 words)

1. Explain with suitable examples, the role of biomechanics in optimizing sports performance.

2. Discuss the applications of Newton's three laws of motion in sports with diagrams.

3. Describe different types of levers in the human body. Give at least two examples of each from sports.

4. Write in detail about the importance of equilibrium and Centre of Gravity in enhancing sports performance.

5. How do friction and projectile motion affect performance in various sports? Explain with examples.

UNIT- 9

PSYCHOLOGY & SPORTS

Topic Covered

9.1 Personality; its definition & types (Jung Classification & Big Five Theory)

9.2. Motivation, its type & techniques.

9.3. Exercise Adherence: Reasons, Benefits & Strategies for enhancing it

9.4. Meaning, Concept & Types of Aggressions in Sports

9.5. Psychological Attributes in Sports – Self-Esteem, Mental Imagery, Self-Talk, Goal Setting

LEARNING OBJECTIVES

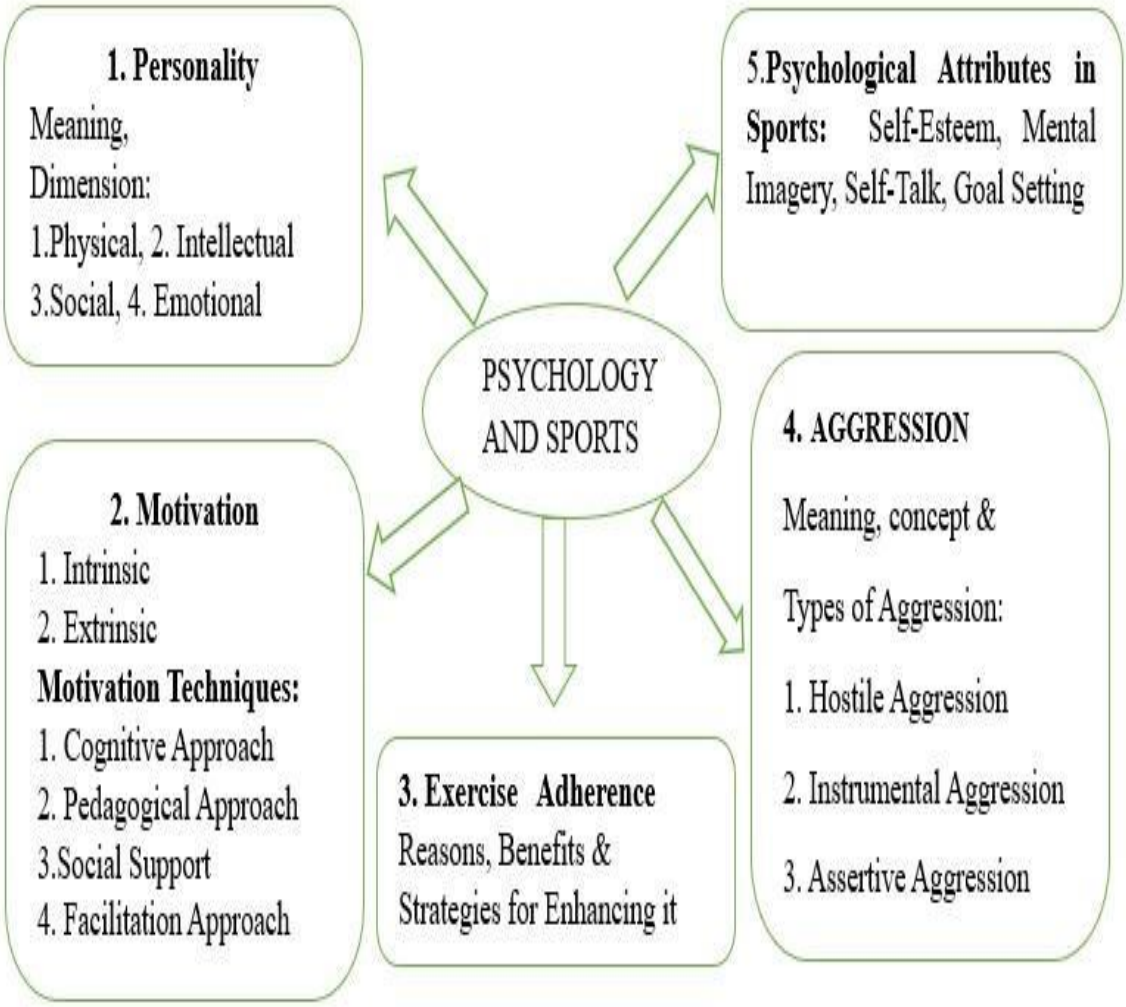
1. Various psychological aspects related to sports personality, motivation, exercise adherence, aggression, and psychological attributes.
2. It aims to define personality, explore its types, understand motivation
3. its techniques, discuss exercise adherence, explain aggression in sports, outline psychological attributes that influence performance in sports

LEARNING OUTCOME

- Classify different types of personality and its relationship with sport performance.
- Recognize concept of motivation and identify various types of motivation.
- Identify various reasons to exercise, its associated benefits and strategies to promote exercise adherence.
- Differentiate between different types of aggression in sports.
- Explain various psychological attribute in sports.

MARKS WEIGHTAGE: 07 MARKS

MIND MAP



PSYCHOLOGY: Study of Human Behaviour

SPORTS PSYCHOLOGY: A Branch of Psychology which applies psychological facts & Principles to human behaviour in the field of sports

9.1 Personality; its definition & types (Jung Classification & Big Five Theory)

PERSONALITY

- 'Personality' is derived from Latin word 'PARSONA' which means 'MASK'.
- Personality is the integration of all habits which determine the role and status of a person in society (by **Burgess**)
- Personality Is Described as Sum Total of All Traits and Distinguishing Qualities of An Individual.
- According to **Eysenck** - "Personality Is the Sum Total of The Actual or Potential Behaviour Patterns of The Organism."
- Personality is the overall impression that a person creates on others
- It is an integrated image of all dimensions, i.e., physical, mental, intellect, social, emotional, vocational, spiritual, etc
- If an individual lacks of any dimensions it will definitely affect his other dimensions of personality.
- These dimensions put together make the personality of an individual

DIMENSIONS OF PERSONALILTY:

Personality is a complete unit in itself but the rate of personality is made up of various dimensions or aspects. The dimension has its own area of operation. These aspects or dimensions together make the personality of an individual

1.Physical 2. Intellectual 3. Social 4. Emotional

1. PHYSICAL DIMENSION

- Physique as The Primary Aspect of Personality.
- Based on fact that 'first impression is the last impression'
- Physical Dimension is related to good physique, good appearance, good health etc.
- Individuals Are Attracted Towards the Person Who Has Good Physique, good Health, good posture, sturdy (strong)body, bright face etc.
- On the other hand, unconfident, stooping (benD), weak person does not give good impression at least in the beginning.
- Physique is the foundation of personality which has the beginning effect on viewers. It is also said that sound mind exists in sound body.
- Physical structure of an individual is related to heredity, environment, and balance diet.
- Balanced Diet, Physical Exercise and Other Environmental Factors Improve Physical Dimension of An Individual.

INTELLECTUAL (MENTAL DIMENSION)

- Mental Dimension is related to mental and intellectual strength and abilities
- Nobody can contribute to the society until and unless one is mentally sound and has acquired ample knowledge.
- Many great personalities of the world are not good looking but they possessed mental and intellectual qualities.
- Development of Thinking, Reasoning, Intuition and Judgement
- How We React and Respond Quickly to Any Situation or Event
- It Helps in Learning New Skills, Adjust in New Circumstances

SOCIAL DIMENSION

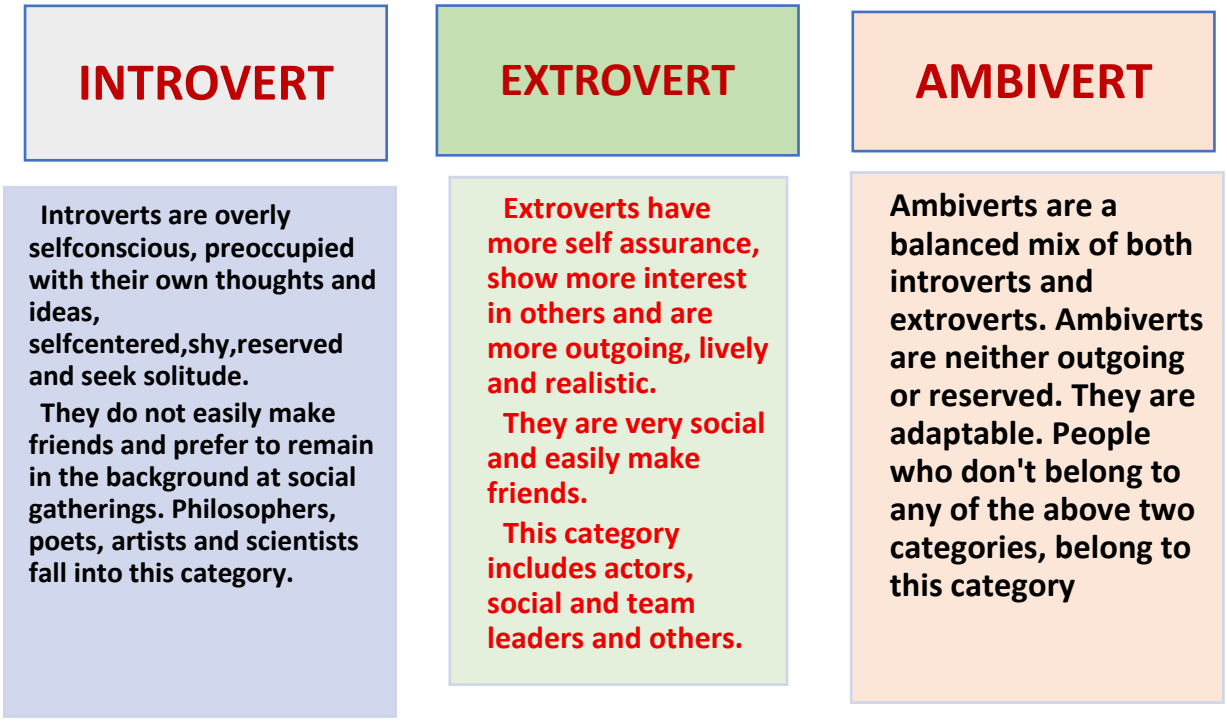
- Human is a social animal. He lives in a society in which his socialisation
- A good personality is one which is sociable and socialising.
- The social qualities take place. like Character, Morality, Etiquettes, Manners, Work Ethics, Friendliness, Good Attitude, Helpful Nature, Cooperation, Sympathy and Kindness, for good personality. etc. are the qualities or traits essential
- These traits are developed in the surroundings in which the individual is living.
- Individuals Take Part in Sports to Satisfy or Gain Social Value Like Status Power, Affection, Inherent Attitude, Tendency, Interest and Capabilities.
- One Has to Modify His/her Behaviour to Follow the Rules, Customs and Tradition of Society.

EMOTIONAL DIMENSION

- Emotional dimension is related to emotional stability.
- It means that one must have proper control over various emotions such as Distress, Amusement or Happiness etc. in different situations. Fear, Anger, Disgust,
- Many sportspersons feel elated (exciteD) when they win but start crying, abusing the umpires or referees when they lose. Such situation shows one's emotional status.
- Such outburst (explosion) of emotions is not a good sign of personality.
- It is a sign of immaturity. In fact, one should be emotionally stable. It is an ingredient of balanced personality

JUNG'S CLASSIFICATION

Carl Jung defines personality types based on mental characteristics. following are the 3 types of personalities given by Carl Jung:



JUNG'S HUMAN PERSONALITY CAN BE CLASSIFIED INTO THREE CATEGORIES

Introvert: If an individual is motivated or energized by the internal world of thoughts, feelings and reflections are known as an Introvert. They are having poor self-confidence, moody, unsocial, quiet and pessimist

Extrovert: This kind of individual is associated with the external world of objects and other people. They believe in action, social settings, and interacting. They are friendly, confident, responsive and lively leader.

Ambiverts: These kinds of people have a mix trait of Introvert and Extrovert: They have few friends.

BIG FIVE PERSONALITY THEORY

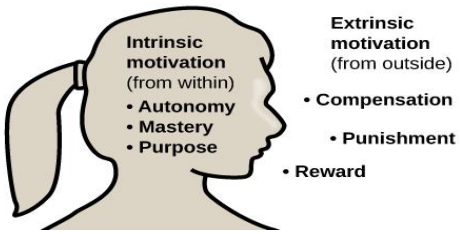
9.2 MOTIVATION

The term Motivation is derived from the Latin word 'Movere', meaning 'to move'. It is

combination of thought, feeling, or condition that causes one to act. Motivation is the driving force behind our actions and behaviours. It is what propels us to pursue our goals and aspirations, even in the face of obstacles and setbacks. Motivation can come from a variety of sources, such as personal values, eternal rewards, or a desire for personal growth and development.

"Any condition that might energise and direct our actions"- Crooks & Stein

9.2.1 INTRINSIC AND EXTRINSIC MOTIVATION



TYPES OF MOTIVATION

(I) Intrinsic Motivation: - In this type of motivation an individual is forced by his internal forces to achieve the goal. In intrinsic motivational state, "an individual is motivated by their own desire not by any external factor" i.e. for enjoyment, for satisfaction, to show mastery over skills, to display superiority or to get social approval, fame etc.

(II) Extrinsic Motivation: - In this kind of motivation, an individual is forced by external forces to achieve a goal such as a prize, praise, scholarship, grade, job, money etc. In the extrinsic motivational state, an individual is motivated by some external factors.

9.2.2 TECHNIQUES OF MOTIVATION

1. COGNITIVE APPROACH

• The active processing and interpretation of information influences the persistent and purposive drive for action by an individual. It is based on the notion that desired motivation can be achieved by an individual through active processing and interpretation of information. Expectancy theory and Goal Setting theory is widely used as a cognitive approach for motivation. Expectancy theory explains that people are motivated for the task where the probability of success is higher in comparison to failure.

(A) Time Bound: The task should be time bound

(B) Set Complexity level of task: Task should be neither too difficult nor too easy

(C) Make task Specific: Task instructions should be precise about what is to be done

(D) Define Purpose of task: Outcome of the task should be clear and defined.

2. SOCIAL SUPPORT STRATEGY

Participation in sports and taking up exercise is greatly influenced by an understanding of the social networking and perception of people around them. A conducive exercise environment, creating drive among people to initiate and maintain sporting behaviour is deeply affected by the societal pressure or support provided to the individual. Positive social support from peer groups, family members, and friends helps in developing healthy habits and enough drive to maintain the act of exercising. Initiating group activities and engagement of family and peers in sports participation helps in increased participation in sports and exercise.

3. Pedagogical Approach : Teaching coaching pedagogies used in sports training for planned outcome is largely responsible in guiding and maintaining the desired behaviour of athletes. Adequate communication and maintenance of positive relationship during training is an essential component influencing the motivation of athletes towards a consistent action or behaviour. Making training

enjoyable, engaging athletes in decision making and providing valuable feedback to athletes are essential components to motivation. Let us discuss few techniques of motivation using a pedagogical approach.

A. Guided Discovery Method: Athletes are highly motivated if by themselves allowed to find solutions to the problems rather than if they are just made to do things as per instruction. Lack of independence in decision making for athletes are major reasons affecting motivation.

B. Valuable Feedback System: To persuade (convince) athletes to push harder for a longer period of time, they must be provided with a strong support system. Assisting athletes with feedback which can provide them with specific direction to move in is an effective means towards effective motivation.

C. Fun-based Training: Training should be challenging and task-oriented for optimal performance. Training methods should involve fun and enjoyment for athletes. Adding creativity and innovation to training and the teaching-learning system helps in adding motivation for athletes to persist with continuous demands of training load.

D. Individualized Training Program (ITP/IEP): All athletes are unique and respond differently to the vast variety of training demands. Each athlete is a unique individual and should have a training programme designed for their abilities and capabilities and which is within attainable limits of the athletes. Individualized training programmes or individualized education programmes are very essential in sports to help athletes to set their own targets, challenges and difficulty levels which will not only help them to avoid burnout, but also keep them motivated.

4. Facilitation Approach

A. Incentives and Rewards: Drive towards an action to maintain it for a long term may sometimes need external support. Awards and rewards work effectively as a motivation force for athletes to pursue sports with consistency and continuity.

B. Valance of Reward (valuing the awarD): Many time prizes and awards are used extrinsic sources of motivation to maintain a desired action or behaviour. But, at times, even these may prove to be ineffective. It is essential to understand that external factors like prize money or medals do motivate athletes, but the most important aspect is to understand the need and expectation of the individual athlete, this is known as 'valance' of the reward or valuing the award. To be motivated, athletes must be awarded by considering what is desired or expected by an individual so that he or she can value that reward. An athlete may like to be rewarded by being made the captain of the team and may value it more than being rewarded with a pay hike.

C. Performance appraisals: Motivation or the driving force for any desired behaviour to last over a long period of time may need support of being recognised and praised for the current and past endeavours. It creates the drive for future action and pursuit of excellence with confidence among athletes. It encourages them to plan their directions and actions. Regular appraisal of performance should be provided to athletes and appropriate rewards given.

D. Quality Support: Motivation for an action is influenced by the amount of facilitation made available for athletes, but the impact is larger only if the quality of support is of a high standard. Factors influencing the desired behaviour of athletes need to be studied, diagnosed and appropriate support needs to be provided to ensure the maintenance of behaviour of the highest standards.

9.2.3 MOTIVATION AND SPORTS :

Motivation as a guiding force to initiate (begin), guide and maintain a behaviour desired for sports participation and performance is well understood but still motivation remains as a challenging task in sports.

Researchers around the world have discussed the methods to maintain or increase the motivation of athletes, but little has been done to understand the reasons about why we participate in an exercise or indulge in sports activities. Summarizing the conclusions of different research,

four motives towards sports and exercise behaviour can be identified.

1. Physical wellbeing;
2. Psychological wellbeing;
3. Performance achievement;
4. Status and Power;

9.3 EXERCISE ADHERENCE

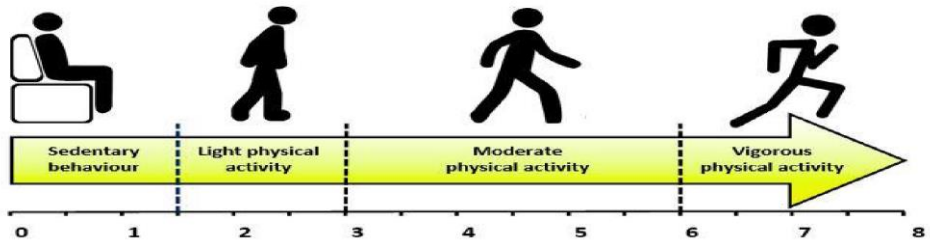
Exercise adherence is the degree to which an individual follows his/her exercise program.

Exercise Adherence Refers to maintaining a systematic approach to exercise for a prolonged period following the initial adoption phase.

Exercise Adherence refers to the continued participation of an individual in the exercise training programme.

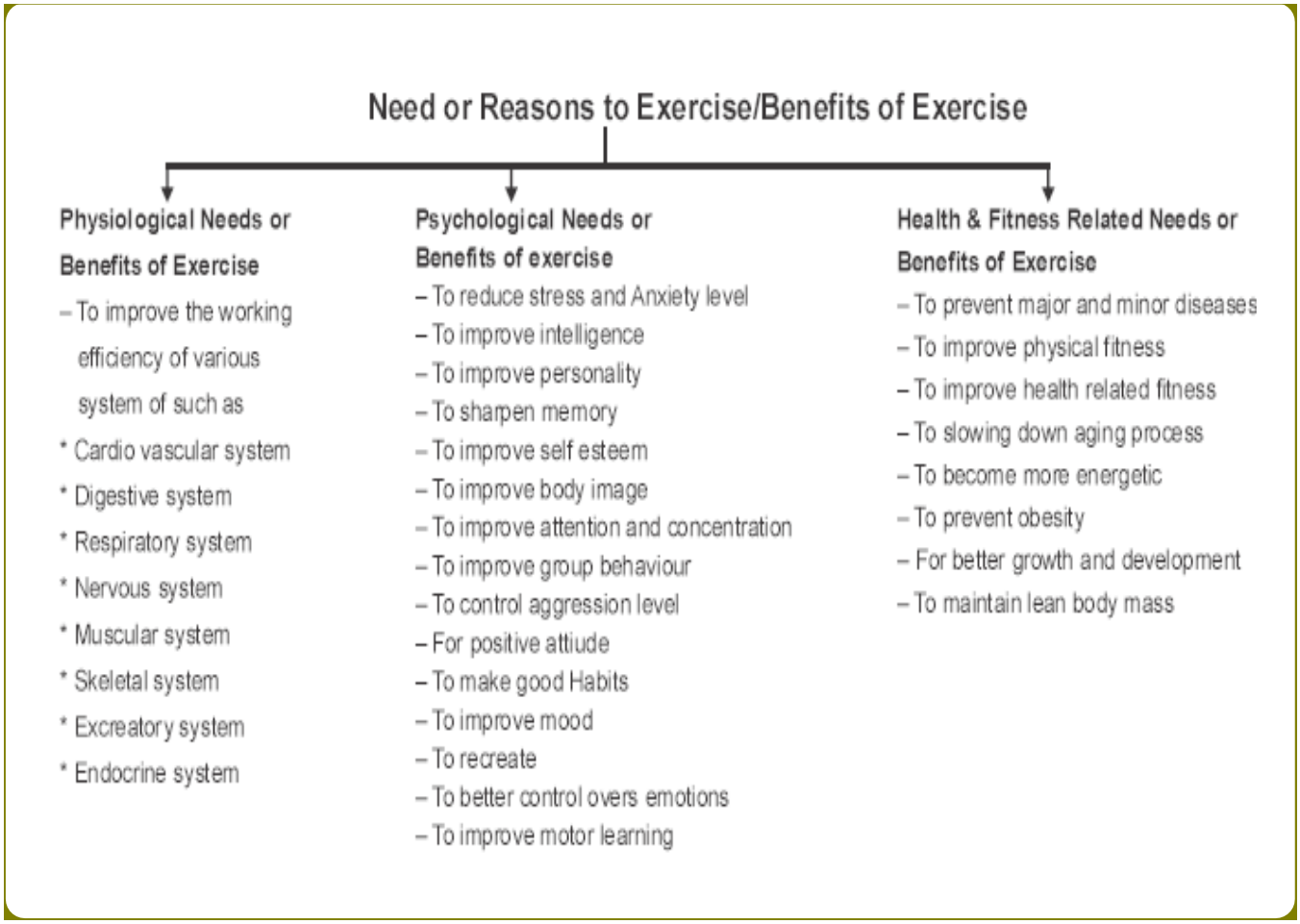
Adherence to exercise is critical to achieving health benefits. Research shows that adherence to exercise can be improved by setting realistic goals, providing social support, and offering positive feedback.

Exercise adherence is the extent to which a patient act in accordance with the advised interval, exercise dose, and exercise dosing regimen.



9.3.1 REASON TO EXERCISE

- **Overcoming Social Physique Anxiety**: People in the society are influenced by how other perceive them in term of their looks, fitness or body shape, weight and size. This leads to adoption of various means and methods to make them lean and fitter.
- **Reduced risk of disease**: To overcome the sedentary lifestyle, adoption of exercise and fitness are considered to be essential and important.
- **Recreation**: With change in lifestyle engagement in serious academics, focus on professional pathways, individuals are facing with the challenge of finding time and activity for recreation, fun and enjoyment. Recreation sports, fitness and exercise provide fun, enjoyment, recreation along with the physical benefits,
- **Mental Relaxation**: Exercise is one of the most effective ways to cope with stress and depression more economically and with tremendous benefits to the society.
- **Socialization**: Often people look for opportunities to engage with community and socialize with friends, peer groups, colleagues etc from their busy life. the most effective way to connect socially is through participation in team sports, group exercises program and various other fitness programs



9.3.2 BENEFITS OF EXERCISE

- **Health Benefits**: –
  - Reduces risk of Cardiovascular Disease
  - Weight Management
  - Strengthens Bones and Muscles
  - Reduces risk of Falls (increase balance)
  - Reduces risk of some Cancers
- **Provides Stress Relief**
- **Increases Happiness**
- **Promotes Self-Efficacy (person's belief in themselves)**
- **Promotes Social Cohesion (unity)**
- **Cognitive Benefits: (relating to intellectual activity)**
  - Attention Control
  - Improves Memory
- **Mental Health Benefits:**
  - Exercise as therapy for emotional disorder
  - Fitness as moderator of life stress
- **Personality Enhancement**
- **Develops Leadership Qualities**
- **Special Population:**

  Elderly Population

BENEFITS OF EXERCISE	
1. Weight Management	5. Provides Stress Relief
2. Promotes Self-efficacy	6. Improves Value Orientation
3. Strong Immune System	7. Develops Leadership Qualities
4. Strengthens bones & Muscles	8. Personality enhancement

9.4 Strategies for Enhancing Adherence to Exercise

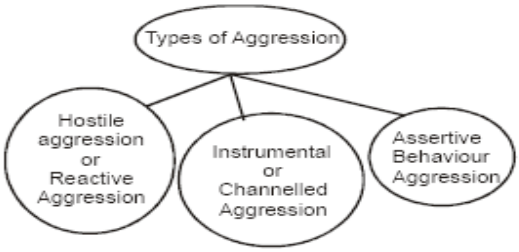
STRATEGIES FOR ENHANCING EXERCISE ADHERENCE	
SIMPLE EXERCISE AT THE BEGINNING	SETTING APPROPRIATE GOAL
SELECT INTERESTING EXERCISE	SUPPORT OF OTHERS
SELECT A VARIETY OF EXERCISE	THANKS, YOURSELF
EXERCISE IN THE MORNING	MAKE A SCHEDULE & BE PUNCTUAL
CONCENTRATE ON YOURSELF	TRACKING YOUR PROGRESS

9.5 Aggression

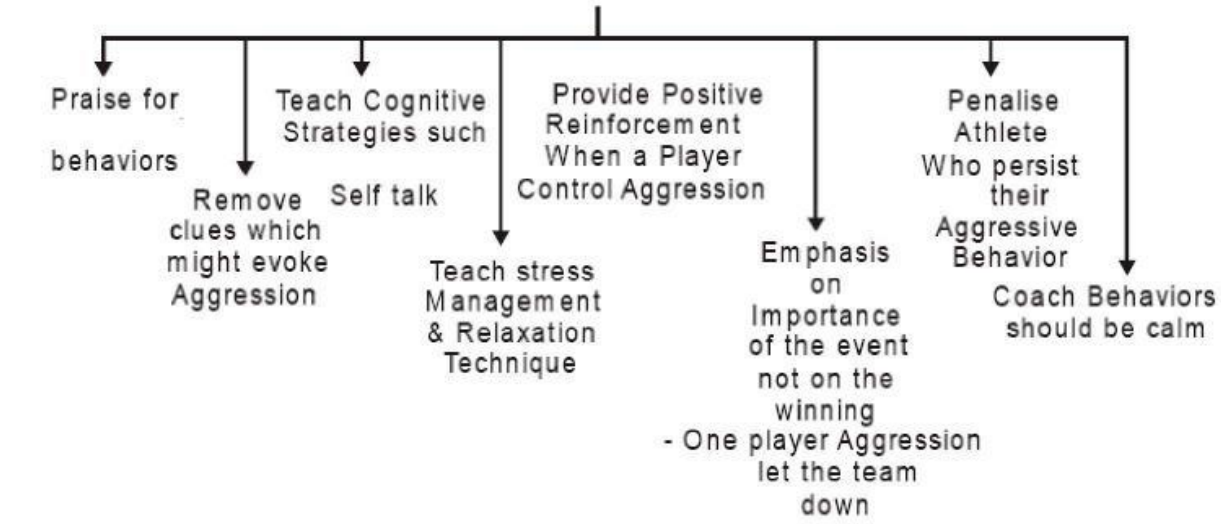
It is a physical or verbal behavior that is directed towards the goal of harming other living beings either physically or psychologically.

9.5.1 TYPES OF AGGRESSION

Hostile Aggression	Instrumental Aggression	Assertive Aggression
Any physical behavior which is aimed to physically injured the living being intentionally is known a Hostile Aggression	Any physical behavior which is aimed at achieving high performance but unintentionally physically harm to a living being is known as instrumental Aggression.	Any verbal behavior under the Rules & Regulation of the sport which is used to harm psychological to living being. In this only legitimate force are used. Example: Sledging in Cricket



WAYS OF CONTROLLING AGGRESSION

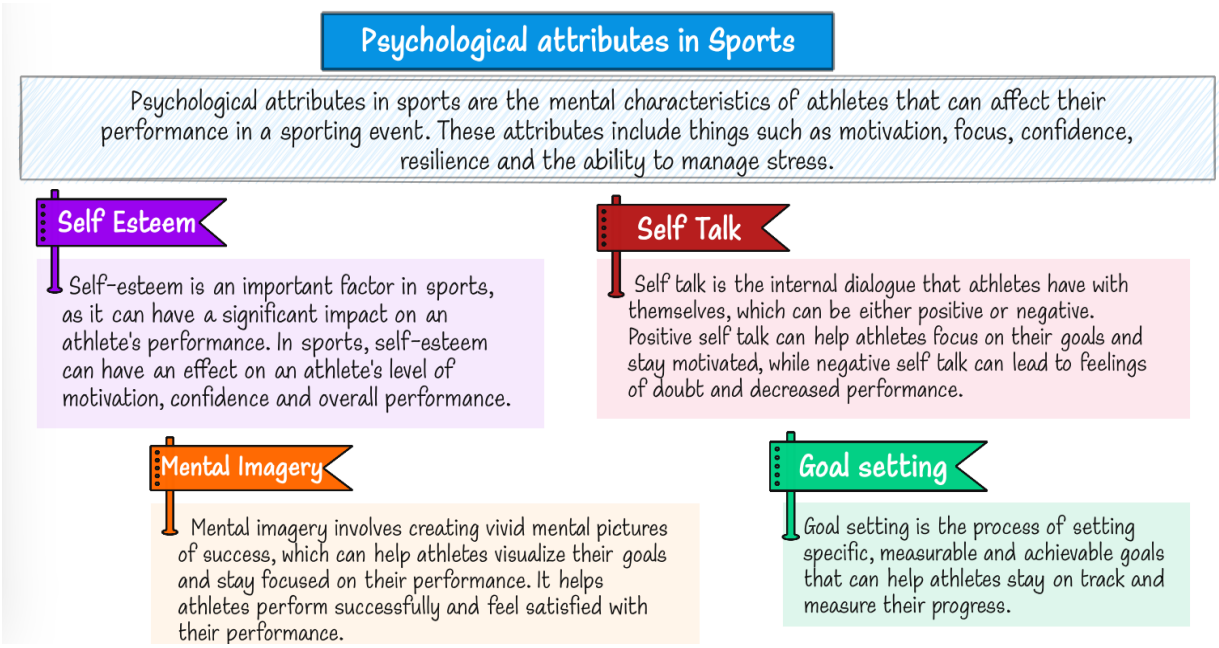


9.5 Psychological Attributes in Sports

Sports scientist from around the world have researched about unique attributes of successful athletes and elite sportsmen to understand factors enabling athletes to perform successfully and reach optimal level of performance in their athletic career.

• Attributes are perceived to be essential for performance effectiveness and athlete development, where athletes abilities to perform, understand and manage training and competition

• SELF ESTEEM, • MENTAL IMAGERY, • SELF TALK, • GOAL SETTING



9.5.1 SELF-ESTEEM

- Self-esteem is how you value and respect yourself as a person. It is the real opinion that you have of yourself. It means confidence in your own abilities or capabilities.
- In fact, self-esteem is the positive or negative evaluations of the self as in how we feel about it.
- The concept of self-esteem generally refers to a person's evaluation of, or attitude toward, him- or herself. Self-esteem is centred around a belief in the self, respect for the self, and confidence in the self

9.5.2 MENTAL IMAGERY

- Mental imagery involves the athlete imagining himself in an environment performing specific activity using his senses (sight, hear, feel & smell).
- It can be defined as pictures in the mind or a visual representation in the absence of environmental input. In fact, it is a multi- sensory process that draws on the senses to create a vivid mental image of a particular process. It is essentially the process of creating and recreating an experience in the mind's eye, which means it can be practiced anytime and anywhere.

9.5.3 SELF TALK

- Self-talk is the process of which an individual may communicate or guide oneself to achieve a set goal. The self-talk refers to our inner dialogue, consisting of statements we say to ourselves, either in our mind or out loud.
- Most of us use self-talk in our lives in different situations like before giving a speech in the school event, etc. This practice helps us appraise and regulate our thoughts and emotions and can help reduce stress and anxiety in certain situations. Athletes also engage in self-talk during training and in competition to motivate themselves.

TYPES OF SELF TALK

- **Task-specific statements relating to technique** category of self-talk refers to words or statements that reinforce technique for example, in the tennis volley, the word "turn" might be used in association with preparation for stepping into the volley.
- **Encouragement and effort** category of self-talk refers to words or statements that provide encouragement to persevere or to try harder self. For example, the phrase "You can do it" might be used in preparation for an anticipated play at home plate in softball.
- **Mood words**: category of self-talk refers to words that precipitate an increase in mood or arousal. For example, the mood words "hard" or "blast" might be used in conjunction with a play in football

BENEFITS OF SELF -TALK

- Focusing attention or concentration
- Skill acquisition (voluntary control over movements)
- Building and developing self-efficacy (person's belief in themselves)
- Creating and changing mood
- Controlling effort

9.5.4 GOAL SETTING

Highly successful athletes, therefore set realistic and achievable goals. Research studies suggest that goals (Smart goals) should be specific, measurable, difficult but attainable, time-based, written down and a combination of short- and long-term goals. As a matter of fact, if you do not set a goal, you cannot achieve apex positions in your life. They should set the goals according to their capabilities and capacities. To keep them on the track with their long-term goals, sports persons should also set the appropriate medium term as well as short term goals.

• Goal setting is a powerful process for thinking about your ideal future, and for motivating yourself to turn your vision of this future into reality

Principles of Goal Setting

- Make goals specific, measurable, and observable.
- Clearly identify time constraints.
- Use moderately difficult goals; they are superior to either easy or very difficult goals.
- Write goals down and regularly monitor progress.
- Use a mix of process, performance, and outcome goals.
- Use short-range goals to achieve long-range goals.
- Set team as well as individual performance goals.
- Set practice as well as competition goals.
- Make sure goals are internalized by the athlete.
- Consider personality and individual differences in goal setting.

Characteristic of effective goal

- **Specific goal** is one that focuses exactly on the goal to be achieved
- **Measurable goal** is one that you can quantify, in the sense that you know exactly how close you are to achieving the goal.
- **Action-oriented goals** have action steps and action plans with detailing of what, when and how to do.
- **Realistic goals** focus on setting the target which are attainable and within the capability and capacity of the athlete
- **Timely** A well-stated goal should be timely in the sense that it specifies time constraints associated with the goal, but also timely in the sense that it reflects an appropriate amount of time to accomplish the goal

Benefits of Goal Setting

- Improved focus attention
- Develop persistence
- Mobilization of efforts
- Developing new learning techniques
- Increased motivation

MULTIPLE CHOICE QUESTION – 1 MARK

1. Which of the following is NOT a dimension of personality?

   A. Openness B. Conscientiousness

   C. Motivation D. Neuroticism

   Answer: C. Motivation

2. Which type of personality is more prone to stress and anxiety?

   A. Type A B. Type B

   C. Extrovert D. Introvert

   Answer: A. Type A

3. What does 'sports psychology' primarily focus on?

   A. Fitness programs B. Rules of sports

   C. Psychological aspects affecting performance D. Sports injuries

   Answer: C. Psychological aspects affecting performance

4. Intrinsic motivation is driven by:

   A. External rewards B. Fear of punishment

   C. Internal satisfaction D. Public pressure

   Answer: C. Internal satisfaction

5. Which of these is a technique to reduce anxiety?

   A. Positive reinforcement B. Meditation

   C. Overtraining D. Competing under pressure

   Answer: B. Meditation

6. A person who is outgoing and enjoys interacting with others is most likely an:

   A. Introvert B. Ambivert

   C. Extrovert D. Narcissist

   Answer: C. Extrovert

7. Which of the following is NOT a type of motivation?

   A. Extrinsic B. Intrinsic

   C. Positive D. Aggressive

   Answer: D. Aggressive

8. Which personality trait is associated with calm and relaxed behaviour?

   A. Type A B. Type B

   C. Extrovert D. Neuroticism

   Answer: B. Type B

9. Anxiety becomes a problem when:

A. It improves performance B. It motivates athletes

C. It affects focus and performance negatively D. It is experienced before a match

Answer: C. It affects focus and performance negatively

10. Which is a psychological benefit of sports?

A. Increased cholesterol B. Reduced endurance

C. Reduced stress D. Physical fatigue

Answer: C. Reduced stress

11. The 'Inverted-U Theory' relates to:

A. Motivation and rewards B. Personality development

C. Stress and relaxation D. Arousal and performance

Answer: D. Arousal and performance

12. Which type of motivation is based on receiving trophies or medals?

A. Intrinsic B. Internal

C. Extrinsic D. Mental

Answer: C. Extrinsic

13. Which technique helps in controlling aggression in sports?

A. Overtraining B. Relaxation techniques

C. Risk-taking behavior D. Ignoring rules

Answer: B. Relaxation techniques

14. Which personality type is more suitable for individual sports?

A. Extrovert B. Type A

C. Introvert D. Type B

Answer: C. Introvert

15. What does the term 'arousal' refer to in sports psychology?

A. Deep sleep B. Mental and physical activation

C. Exhaustion D. Aggression

Answer: B. Mental and physical activation

UNSOLVED QUESTIONS

1. What is the primary goal of sports psychology?
   A) To win at any cost
   B) To improve mental and emotional well-being and performance in sports
   C) To develop physical skills D) To assess athletic ability

2. Which of the following is NOT a psychological factor that influences performance in sports?

   A) Motivation B) Self-esteem
   C) Physical fitness level D) Mental imagery

3. What is the term for the process of visualizing successful outcomes or performance in sports?
   A) Self-talk B) Mental imagery
   C) Goal setting D) Positive reinforcement

4. Which of the following is an example of self-talk?
   A) "I'm going to win this game." B) "I'm feeling nervous."
   C) "I'm going to try my best." D) "I have practiced this before."

5. What is the term for the process of setting specific, measurable, achievable, relevant, and time-bound goals?
   A) Self-talk B) Goal setting
   C) Mental imagery D) Positive reinforcement

VERY SHORT ANSWERS – 2 MARKS

Q.1 – What do you mean by personality?

Ans – Personality usually means that an individual is much more than his outer appearance. It is a dynamic and organized set of characteristics passed by a person that influences his/her cognitions, emotions, motivations and behaviours in different types of situations.

Q.2 – Explain about emotional dimension of personality in detail.

Ans – Emotional dimension is also an important dimension of personality. Emotional dimension is related to emotional stability. To have emotional stability is essential aspect of one's personality. It means that one must have proper control over various emotions such as fear, anger, disgust, distress, amusement or happiness etc. in different situations. As a matter of fact, many sportspersons feel elated when they win but start crying, abusing the umpires or referee when they lose. Such situations show one's emotional status spontaneous outburst of such emotions is not accepted as a sign of good personality.

Q.3 – Explain spectators as source of motivation.

Ans – If there is a huge number of spectators, it will have a positive effect on the players. But its effectiveness depends upon the experience and maturity of athletes. If an inexperienced athlete participates in competition, which is full of spectators, then he will not be able to perform better in comparison to an in experienced athlete. An inexperienced athlete is usually overpowered by fear.

Q.4 – Discuss intrinsic and extrinsic motivation.

Ans – 1.**Intrinsic motivation:** Intrinsic motivation is internal. It occurs when people are compelled to do something out of pleasure, importance or desire. Motivation is always intrinsic when the force comes from within oneself.

2. **Extrinsic Motivation:** Extrinsic motivation is external. It occurs when external factors compel the person to do something. Motivation is always extrinsic, when external forces, positive or negative produce a behavioural change, reward, punishment, praise, blame or cash prize etc.

Q.5 – What do understand by Motivation?

Ans: Definition: Motivation is a psychological factor that inspires individuals to perform better.

- Types: Intrinsic motivation (internal) and Extrinsic motivation (external).
- Techniques: Goal setting, rewards, praise, feedback, and healthy competition.

Q-6 What do understand by Aggression?

Ans - Definition: Aggression refers to behaviour that causes physical or psychological harm to others. - Types: Impulsive aggression, Instrumental aggression, and Assertive behaviour aggression.

Q-7 What do understand by Psychological Attributes?

Ans. - Self-Esteem: A person's overall sense of personal worth or value.

- Mental Imagery: A technique to visualize and rehearse performance, enhancing confidence and focus.
- Self-Talk: Positive or negative inner dialogue that affects performance and motivation.
- Goal Setting: A process to achieve specific, measurable, and attainable goals.

Q-7 What do understand by Exercise Adherence?

Ans - Reasons: Regular exercise promotes healthy aging, boosts self-confidence, and reduces stress.

- Benefits: Improves mood, enhances mental alertness, and increases overall well-being.
- Strategies: Set achievable goals, track progress, and seek social support.

Q- 8. What is aggression in sports, and how can it be managed?

Ans - Aggression in sports refers to behavior that causes physical or psychological harm to others. It can be managed through techniques such as:

- Channeling aggression into positive performance
- Practicing relaxation and stress management techniques
- Developing empathy and respect for others

Q- 9. Discuss the importance of goal setting in sports.

Ans. Goal setting is essential in sports as it helps athletes:

- Focus on specific targets
- Develop motivation and direction
- Enhance self-confidence and self-efficacy
- Evaluate progress and adjust strategies

Q- 10. What is self-esteem, and how does it affect sports performance?

Ans - Self-esteem refers to an individual's overall sense of self-worth. High self-esteem can enhance sports performance by boosting confidence, motivation, and resilience, while low self-esteem can lead to self-doubt and decreased performance.

UNSOLVED QUESTIONS

1. What is the role of psychology in sports?

2. Define motivation and explain its importance in sports.

3. What is self-esteem, and how does it impact sports performance?

4. Explain the concept of mental imagery and its benefits in sports.

5. Discuss the types of aggression in sports and how they can be managed.

SHORT ANSWERS – 3 MARKS

Q- 1. What is the importance of sports psychology?
Answer: The importance of sports psychology can be understood from the following'points

- It analyses the behaviour of sportsmen.
- It identifies talent for specific sport's.
- It creates a better learning situation.
- It stabilises the performance of a sportsperson for a longer period.
- It is important from the research point of view.
- It encourages the players to make a comeback in professional sports.

Q- 2. Explain any two techniques to manage stress.
Answer: Two techniques to manage stress are –

- Aim to Exercise Regularly Exercise dissipates the adrenaline that builds up in stressful situations and leaves us with a feeling or sense of achievement and control.
- Eat Healthy Ensure that you are getting adequate vitamins and minerals in your diet. One recommendation that very few of us manage to follow is to eat 5 servings of fruit and vegetables every day.

Q- 3. Explain the type of aggression in sports.

Answer: There are two types of aggression in sports

- Instrumental Aggression It is a type of aggression in which behaviour is directed at the target as a means to an end. For example, injuring a player to gain a competitive advantage or stopping an opponent from scoring.
- Hostile Aggression It is a type of aggression in which behaviour is aimed toward another person who has angered or provoked the individual and is an end in itself. For example, hitting an opponent who has just been aggressive against the player. It is generally proceeded by anger.

Q-4 Explain goal setting as a technique of motivation in brief.

Answer: Goal setting technique is one of the most important techniques of motivation. If you do not set a goal, you cannot achieve an apex position in life. A person should set goals according to one's capabilities on a regular basis. Coaches should not be too rigid while setting goals for a sportsperson. There should be some flexibility in their approach.

Q-5 Explain any three causes of anxiety.
Answer. The various causes of anxiety are (any three):

1. Uncertainty about Result Competitions provide challenge and stimulation. It is in the field of unpredictability. The outcome is not known. One is under pressure for one's achievements.
2. Level of Competition The more important the contest, the greater is the stress or level of anxiety for that particular competition.
3. Expectations of Spectators The spectators have a huge role or impact on how athletes feel. The expectations are more when it is a home venue.

Q-6 Explain any two techniques to manage stress.
Answer. Two techniques to manage stress are:

1. Participation in Physical Activities Physical exercises of moderate to high intensity, like aerobic exercises, are one of the"best methods to relieve stress. Physically fit persons are more resistant to the effects of stress than others.
2. Achieve a High Level of Physical Fitness Achieving fitness is important to manage stress advantageously, while not eliminating it totally. Too little or too severe stress both lower performance in sports.

UNSOLVED QUESTIONS

1. **What is ethics in sports?**
2. **Differentiate between cognitive and somatic anxiety.**
3. **What are the components of personality? Briefly explain any three.**
4. **Explain the relationship between sports and personality development.**

LONG ANSWERS – 4 MARKS

Q- 1 Explain any three techniques of motivation for higher achievement in sports.

Ans – 1. **Presence of opposite sex:** Opposite sex plays a vital role in motivation. Usually girls are motivated by the presence of boys, whereas boys are motivated by the presence of girls. This is an innate tendency of human brings. Even girls as well as boys try to be smart and active in the presence of opposite sex.

2. **Spectators:** If there is a huge number of spectators, it will have a positive effect on the players. But its effectiveness depends upon the experiences and maturity of athletes. If an inexperienced athlete participates in completion, which is full of spectators, then he will not be able to perform better in comparison to an experienced others.

3. **Hypnotism:** The motivation through hypnotism can be effective but, generally, it is discarded by the public. It has its scientific base. Several studies show its positive effects. Simple and direct strength may be improved through hypnotism if it is properly employed by a trained person.

Q.2– Discuss the points to improve the body image and self-esteem in detail.

Ans–1. **To have a positive and optimistic attitude:** A positive and optimistic attitude can help individuals to improve body image and self-esteem. So one should try muscles or change in body shape and size can be a healthy choice.

2. **To change your life style:** Changes in your life style such as adopting a specific diet and with planned exercise programme in order to lose weight, gin muscles or change in body shape and size can be a healthy choice.

3. **To identify all the aspects of your appearance realistically:** For improving body image and self-esteem, identify all the aspects of your appearance which you can change realistically and which you can't change. It is well known fact that human beings are imperfect.

4. **To stop your intrinsic negative comments:** When you hear negative comments coming from the core of your heart, stop them immediately if you want to improve your body image and self-esteem.

5. **To give compliments about good things done by you:** If you want to improve your self-esteem and body image, do some good things everyday and give compliments to yourself that you really have done good things. This act will give you immense pleasure.

Q-3 Read the following Case Study carefully answer the questions.

A state sports team was winning all the tournaments and was highly praised for its efforts. An interview with the team to find and explore the reasons for its continuous success highlighted the following reasons. As per the report, the team had many new players who were wellorganised, responsible, self-disciplined and precise in their task and contributed to the success of the team. The Captain had been selected by the team members themselves, and he was most interactive, sociable and optimistic on the field as well as off it. This made him a good leader.

The best part of the team was that, all its senior players were helpful and cooperative with their juniors and were always willing to listen to them. The team's coach mentioned few essential elements that had contributed to the team's success. According to him, the ability to motivate people plays a crucial role in the team's success more often than the technical skills, and this is what separates a good coach from an average one. The coach also referred to occasions when players went through the phase of lack of intrinsic motivation. The coach realised that while there are some athletes have an innate drive to constantly strive for success and enjoy their task, there are others who seem to lack internal motivation and need extrinsic factors like rewards, prize, money etc. to create the required drive or required behaviour. The team's psychologist spoke about the aggressive behaviour among the team players against the opponents. It was interesting to listen to various instances where the players had instigated opponents or charged at them violently, in anger, but had later tried to justify their actions.

Sometimes, players were found to be abusing opponents not in anger, but to get an advantage or for the sake of winning, though this behaviour is not acceptable and they were awarded punishments as per the code of conduct and rules of sport.

Read the above story of a sports team and answer the following questions?

1. Which trait best reflected the personality of junior players?

(A) Introvert (B) Conscientiousness (C) Neuroticism

2. Which member of the team reflected most of the Extrovert traits?

(A) Coach (B) New Members (C) Captain

3. Which type of players were recommended for special training with Sports Psychologist?

(A) Extrovert (A) Introvert (A) Mesomorph

4. The team sports psychologist is referring to which type of behaviour as non-threatening but confident.

(A) Assertive (A) Hostile (A) Instrumental

Q-4 For each question, choose the correct option:

Assertion (A): Motivation is a key factor that influences performance in sports.
Reason (R): Motivation helps an athlete to overcome fatigue and continue training.

(A) Both Assertion (A) and Reason (R) are true, and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true, but R is false.
(D) A is false, but R is true.
Answer- A Both Assertion (A) and Reason (R) are true, and R is the correct explanation of A

UNSOLVED QUESTIONS

1. How can a coach strategize in motivating an athlete to keep performing?
2. How does motivating a sports person affect games and sports and how do games and sports influence a player's motivation?

LONG ANSWERS – 5 MARKS

Q-1 Explain the concept of aggression in sports and its types.

Aggression in sports refers to behaviour that causes physical or psychological harm to others. Types of aggression:

- Impulsive aggression: spontaneous and emotional
- Instrumental aggression: planned and intentional

Managing aggression: Athletes and coaches can manage aggression through techniques like relaxation, stress management, and empathy

Q-2 Discuss the benefits of exercise and physical activity on mental health and well-being.

Regular exercise and physical activity have numerous benefits for mental health and well-being, including:

- Reducing stress and anxiety
- Improving mood and self-esteem
- Enhancing cognitive function
- Promoting better sleep
- Increasing overall well-being

Conclusion: Exercise and physical activity are essential for maintaining good mental health and well-being, and athletes and individuals can benefit from regular physical activity

Q-3 Explain the importance of sports psychology for coaches and athletes.
Answer: Sports Psychology helps understand how psychological factors affect physical performance and how participation in sports influences psychological well-being.

Importance for Coaches and Athletes:

1. **Improves Performance:**
   - Helps athletes deal with pressure, anxiety, and fear of failure.
   - Increases focus and concentration.
2. **Builds Confidence:**
   - Positive thinking and visualization improve self-belief.
   - Coaches use reinforcement to boost athlete morale.
3. **Enhances Motivation:**
   - Helps athletes set realistic goals and stay committed.
   - Maintains interest during rigorous training phases.

4. **Manages Stress & Anxiety:**
    - Techniques like deep breathing and meditation help calm the mind.
    - Reduces performance anxiety before competitions.
5. **Team Cohesion:**
    - Builds better communication and cooperation among team members.
    - Coaches can understand and manage individual personalities.

UNSOLVED QUESTIONS

1. Explain the relationship between personality types and performance in individual and team sports.
2. Define anxiety and stress. Differentiate between them with examples

UNIT -10
TRAINING IN SPORTS

CONTENT:

• Concept of Talent Identification and Talent Development in Sports

• Introduction to Sports Training Cycle – Micro, Meso, Macro Cycle.

• Types & Methods to Develop – Strength, Endurance, and Speed.

• Types & Methods to Develop – Flexibility and Coordinative Ability.

• Circuit Training - Introduction & its importance

LEARNING OBJECTIVES

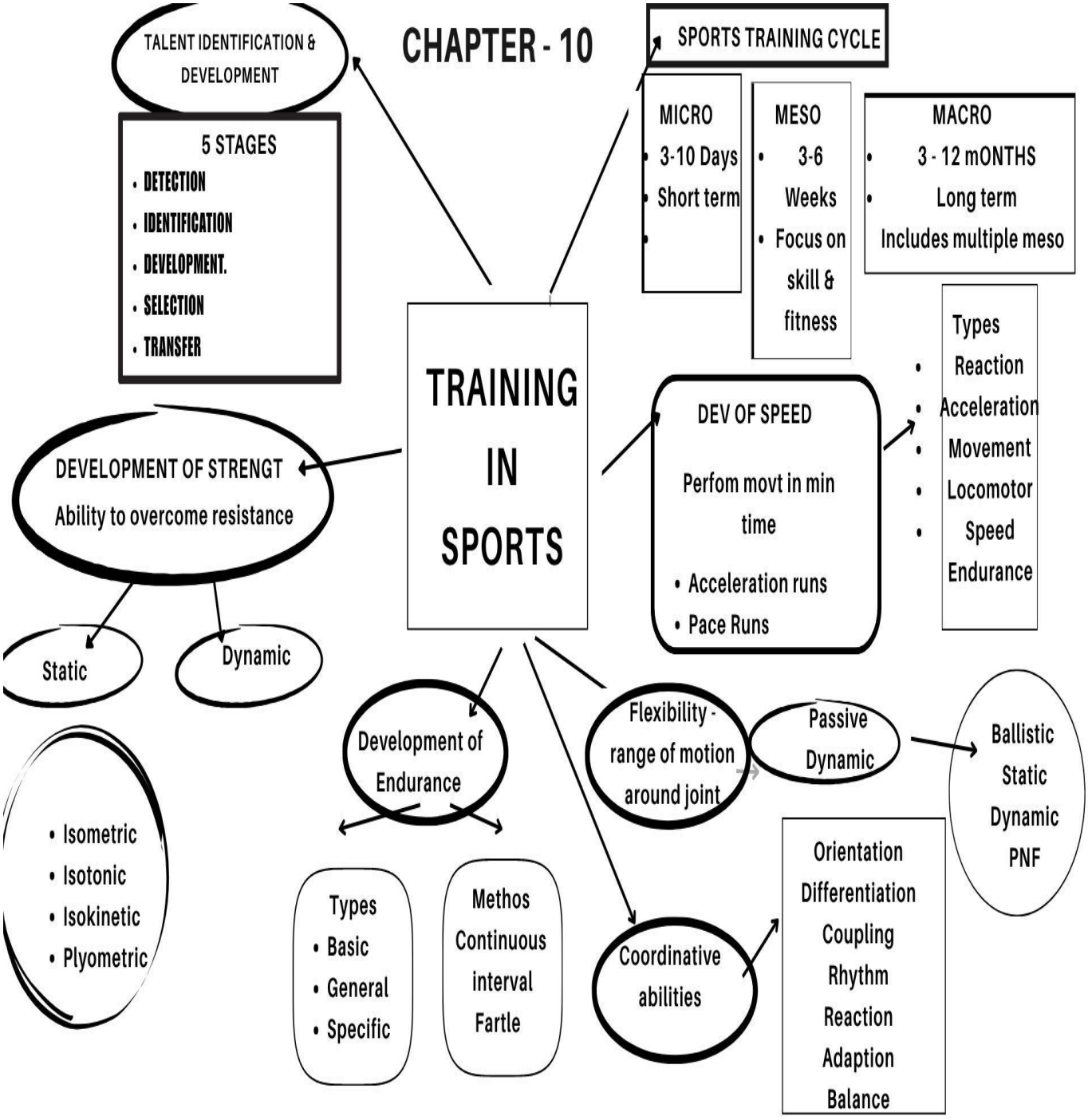
- To learn about the Concept of Talent Identification and Talent Development in Sports
- To learn about the different Sports Training Cycle – Micro, Meso, Macro Cycle
- To learn about Types & Methods to Develop – Strength, Endurance, and Speed
- To learn about Types & Methods to Develop – Flexibility and Coordinative Ability

LEARNING OUTCOMES

- Understand the concept of talent identification and explore various methods used for talent development in sports.
- Gain knowledge of sports training principles and the different training cycles involved in the process (e.g., micro, meso, and macro cycles).
- Learn about the types and methods used to develop strength, endurance, and speed in sports training.
- Understand the types and techniques for enhancing flexibility and coordinative abilities in athletes.

MIND MAP

MARKS WEIGHTAGE- 9 MARKS



10.1 Talent Identification and Talent Development

Talent refers to an above-average aptitude or natural ability in a specific area, allowing an individual to perform tasks with relative ease. In sports, **talent identification** is the process of recognising young individuals who are likely to excel in specific sports, based on fitness, maturity, and performance indicators. It is the first step toward building international-level athletes, followed by **talent development**, which involves nurturing their potential.

The system typically includes multiple stages:

- Initial identification (ages 10–12) through simple field tests in schools.
- Advanced selection (ages 13–16) involves specialized tests, including physical, psychological, and performance data.
- Allocation of top performers to elite junior training programs.
- Encouragement for others to join club-level or recreational sports to broaden the talent base.
- Schools play a key role, and testing methods should suit local conditions while remaining standardized.

This structured approach ensures early identification and long-term development of sporting talent, especially in developing countries.

10.1.1 Components of Talent Identification (TID)

Talent Identification (TID) involves evaluating several key components to determine an individual's potential for success in sports. These components include:

- **Physiological Attributes**:
  Includes aerobic capacity, anaerobic power, metabolism, and recovery rate — essential for endurance and energy efficiency.
- **Physical Attributes**:
  Covers height, weight, body composition, strength, speed, agility, flexibility, and coordination.
- **Psychological Attributes**:
  Refers to mental toughness, motivation, focus, competitive spirit, and the ability to handle pressure.
- **Technical/Tactical Attributes**:
  Involves sport-specific skills (technique) and decision-making abilities (tactics) during gameplay or performance.
- **Results**:
  Performance in previous competitions, training progress, and comparison with age-group standards.
- **Intangibles**:
  Includes work ethic, discipline, attitude, willingness to learn, and coachability — often hard to measure but crucial for long-term success.

10.2 INTRODUCTION TO SPORTS TRAINING CYCLES – MICRO, MESO, MACRO

- Sports training involves a systematic, long-term planning process to ensure peak performance at the right time, especially for major competitions like the Olympics. The training is broken down into smaller units to manage the workload and monitor progress effectively.

10.2.1 Hierarchy of Training Plans

Long-term Plan:
Covers 8–15 years; starts from basic training to achieving peak performance in a sport.

- Olympic Plan:

  Spans 4 years and includes yearly assessments, predictions, and training prescriptions (Preparation, Competition, Transition).
- Annual Plan:

  Divides the year into phases based on competition and preparation goals.
- Sectional Plans:

  Shorter-term plans like periods, phases, and cycles—including macrocycle, mesocycle, and microcycle.

10.2.2 **Types of Training Cycles:**

- **Macrocycle:**

  A large training block that usually covers 6 months to 1 year and includes all phases (preparation, competition, transition).
- **Mesocycle:**

  A medium-duration cycle (2–6 weeks) that focuses on a specific training objective (e.g., strength, endurance).
- **Microcycle:**

  The shortest cycle (3–10 days); typically 5–10 days for advanced athletes. It includes:
- A mix of high, medium, and low-load training days.

  Example load structures:

  1:1 – One high-load day followed by one medium/low-load day.

  2:1 – Two high-load days followed by one medium/low-load day.

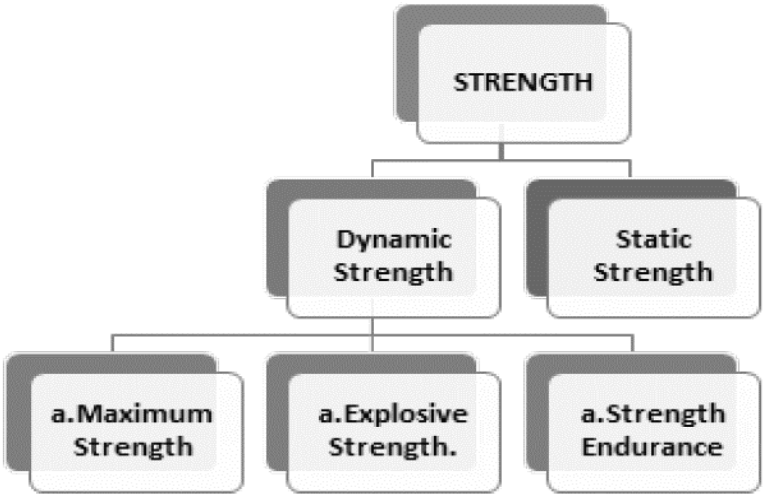
  The last day often includes active recovery to prepare for the next cycle.

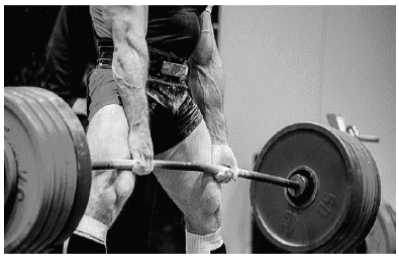
  Key Insight:

  All short-term training cycles align with long-term objectives. Planning in this manner ensures peak performance at major events like the Olympics and helps avoid overtraining or injury.

10.3 STRENGTH

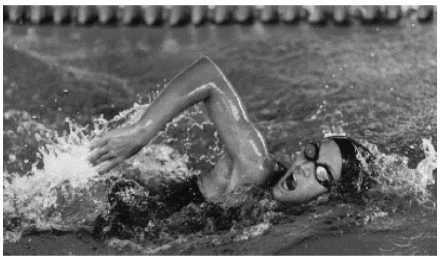
Strength is the ability of muscles to overcome resistance and is a vital motor component in all sports, as every movement results from muscle contraction. According to H. Singh, strength is the ability to act against resistance. It is broadly classified into **Static Strength** (isometric, without visible movement, e.g., plank or yoga poses) and **Dynamic Strength** (isotonic, with visible movement, e.g., push-ups, squats). Dynamic strength is further divided into **Maximum Strength** (lifting max load in a single contraction), **Explosive Strength** (force exerted quickly, e.g., in sprinting, jumping), and **Strength Endurance** (sustaining force under fatigue, e.g., in long-distance running, swimming).





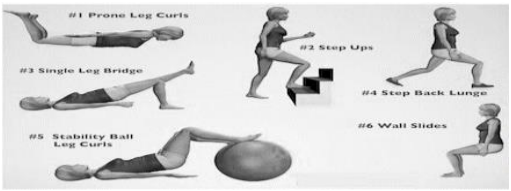
Eg: Maximum Strength

Eg: Explosive Strength



Eg: Strength Endurance

10.3.1Strength development methods include:

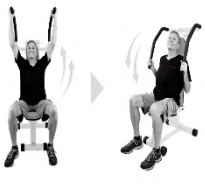


Isometric exercises no visible movement,
e.g., pushing a wall
useful for injured athletes and general strength maintenance.

Isotonic exercises

visible movement, e.g., weightlifting, calisthenics
considered best for building functional strength.

Isokinetic exercises



constant speed contractions using special equipment,
e.g., in swimming, rowing – scientifically limited in
contribution but applied in specific sports scenarios.

Comparative table

KEY ASPECT

Each method targets different aspects of muscular strength and should be chosen based on the sport's needs.

10.4 ENDURANCE

Endurance is the ability to maintain a certain level of energy or sustain an activity over time. It's a conditional ability crucial for health, training, and sports performance.

Definitions

- **Harre:** "The ability to resist fatigue."
- **Barrow and McGee:** "The result of a physiological capacity to sustain movement over time."
- **H. Singh:** "The ability to sustain an activity."

10.4.1 Types of Endurance

I. Based on Nature of the Activity

1. **Basic Endurance**
   - Medium intensity, aerobic.
   - Involves large muscles for prolonged duration (e.g., jogging, cycling for >30 mins).
   - Foundation for all other endurance types.
2. **General Endurance**
   - Prolonged non-specific activities (e.g., general workouts).
   - May include high-intensity but shorter duration.
3. **Specific Endurance**
   - Activity-specific fatigue resistance.
   - Varies by sport (e.g., hockey vs marathon vs cycling).

II. Based on Duration of Activity

1. **Speed Endurance**
   - Up to 45 seconds (e.g., 400m sprint).
   - Power-dependent.
2. **Short-Term Endurance**
   - 45 seconds to 2 minutes (e.g., 800m run).
   - Depends on speed and strength endurance.
3. **Medium-Time Endurance**
   - 2 to 11 minutes (e.g., 1500m, 3000m).
   - Less strength/speed dependent.

4. **Long-Time Endurance**
    - More than 11 minutes (e.g., marathon, cross-country).

10.4.2 Methods to Develop Endurance

1. **Continuous Method**

Performed without rest; low to moderate intensity.

A) Slow Continuous Method

- Steady pace; HR: 140–160 bpm.
- Duration: ≥30 mins.
- Effects: Improves fat metabolism, mitochondria, capillarization, heart/lung function, willpower.

B) Fast Continuous Method

- Uniform higher pace; HR: 160–180 bpm.
- Duration: ≥20 mins.
- Effects: Increases VO_2 max, anaerobic capacity.

C) Variable Pace Method

- Pre-planned speed changes; HR: 140–180 bpm.
- Duration: 15–60 mins.
- Effects: Boosts mitochondria, confidence, heart-lung efficiency.

D) Fartlek Method (Speed Play)

- Spontaneous pace changes based on terrain/feel.
- Benefits: Improves race tactics, mental strength, fast/slow twitch response.

2. Interval Method

High-intensity work with incomplete rest.

- HR rises to 180 bpm during work, resumes at 120–130 bpm before next effort.
- Effects:
    - Improves VO_2 max
    - Enhances aerobic and lactic acid tolerance
    - Boosts circulatory efficiency

3. Repetition Method

- Very **high intensity**: 90–100% effort.
- Includes **complete recovery** between repetitions.
- Best suited for developing **speed endurance**.

- **Effects:**
    - Improved **anaerobic capacity**
    - Increased **lactic acid tolerance**
    - Enhanced **phosphagen (ATP-PC) stores**

10.5 SPEED

Speed is the ability to perform motor movements as quickly as possible, either cyclic (repetitive) or acyclic (single burst).

Theiss and Schnabel: "Speed is the prerequisite to do motor actions under given conditions in the minimum of time."

Johnson and Nelson: "Speed is the capacity of an individual to perform successive movement of the same pattern at a fast rate."

Factors Affecting Speed

- Nervous system mobility
- Explosive strength
- Proper technique
- Biochemical and metabolic power
- Flexibility
- Psychic factors: arousal, attention, motivation, concentration, relaxation ability

10.5.1 Types of Speed

1. **Reaction Ability**: Reacting quickly to a stimulus (visual, auditory, tactile). Dependent on coordinative abilities. Types: Simple & Complex.

2. **Acceleration Ability**: Ability to reach high speed from rest. Depends on explosive strength, technique, movement frequency. Crucial in sprinting.

3. **Movement Speed**: Performing a single movement in minimum time. Relevant in acyclic sports. Depends on explosive power and technique.

4. **Locomotor Ability**: Maintaining maximum speed for max duration/distance. Key for 100–200m sprints, skating, cycling. Limited improvement potential.

5. **Speed Endurance**: Maintaining high speed under fatigue. Important in 400m sprints. Depends on anaerobic capacity, technique, and mental strength.

10.5.2 Methods to Develop Speed

Note: Speed is limited by genetics (fast-twitch vs. slow-twitch muscle fiber ratio), but training (environmental factors) can improve it.

1. **Acceleration Runs**: From a stationary start, gain speed quickly over 30–60m. Max speed usually reached by 50–60m. 6–12 reps with full rest.

2. **Pace Runs**: Running at a steady pace over a set distance. For races ≥800m. Train with distances 10–20% longer than race. Full recovery between reps.

10.6 Flexibility

Flexibility is also known as the **range of motion around a joint**. It is the ability to execute a movement with greater amplitude or range. Flexibility is influenced by both **genetic factors** and **physical activity programmes**. It is considered a **motor component**, but not classified under conditional or coordinative abilities.

In general use, the term flexibility is associated with:

- Stretch ability
- Elasticity
- Litheness
- Mobility
- Pliancy

Several factors affect flexibility, including:

- Muscle strength
- Joint structure
- Tendons and ligaments
- Neuromuscular coordination

A person with good flexibility can:

- Perform daily tasks more easily, efficiently, and effectively
- Have better posture and a more attractive personality
- Avoid tight joints that hinder smooth and efficient movement

Benefits of Flexibility

- Prevents injuries
- Improves posture
- Reduces back pain
- Maintains healthy joints
- Improves movement balance
- Speeds up learning of skills (e.g., backstroke in swimming)

10.6.1 Importance of Flexibility

Flexibility has an important inter-relationship with other factors that improve performance. Hence, it is essential to develop flexibility to varying degrees depending on the activity.

Key benefits of flexibility include:

1. **Greater range of motion** ensures more force and speed developed by the muscles.
2. Allows movements with **minimum muscular tension**, promoting higher movement economy.
3. **Reduces stiffness** in joints, allowing smoother motion.
4. **Decreases the risk of injury** as muscles and tendons become more pliable and responsive.
5. Assists in **maintaining appropriate posture** during performance.

10.6.2 Types of Flexibility

Flexibility is categorized into two primary types:

(A) Passive Flexibility
Passive flexibility is the ability to perform movements with a greater range using **external assistance**.
Example: Stretching with the help of a partner.

- Passive flexibility is **always greater than active flexibility**.
- It is mainly influenced by the **structure of the joints** and the **stretchability of muscles and ligaments**.
- It forms the **foundation for active (operational) flexibility**.

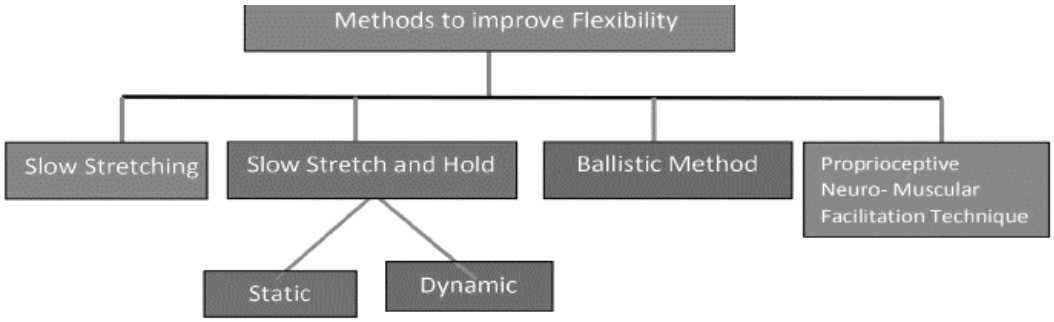
(B) Active Flexibility
Active flexibility is the ability to perform movements with greater range **without any external help**.
Example: A sportsperson stretching on their own.

- Active flexibility is **less than passive flexibility**.
- A large gap between active and passive flexibility may indicate a **lack of muscular strength or coordination**.
- Active flexibility is further divided into:

a. **Static Flexibility**
Required for movements done while in a stationary **position**, such as standing, sitting, or lying down.

b. **Dynamic Flexibility**
Required for executing movements **while in motion**, such as in running or performing gymnastic routines.

10.6.3 Methods to improve flexibility



1. **Slow Stretching**
    - Involves gently stretching muscles around a joint.
    - Movements should be **slow and controlled**, avoiding jerks.
2. **Slow Stretch and Hold (Static & Dynamic Stretching)**
    - **Static Stretching**:
        - Slowly stretch and **hold the position**.
        - Hold for **10 sec** (cool down) or **30 sec** (improve flexibility).

3. **Dynamic Stretching**:
    - Involves **controlled, continuous movements** (e.g., arm swings, leg swings).
    - Suitable **before dynamic activities/sports**.
4. **Ballistic Stretching**
    - Involves **bouncing or rhythmic movements**.
    - Uses **momentum** to stretch muscles.
    - **Not recommended** by many experts due to **risk of injury**.
5. **Proprioceptive Neuromuscular Facilitation (PNF)**
    - Also called **post-isometric stretch**
    - Steps:

        0. Contract the muscle for **5–7 seconds**.
        1. Relax and stretch the muscle to its limit.
        2. Hold for **8–10 seconds**.
        3. Repeat **4–8 times**.
    - Based on muscle **relaxation after contraction**.

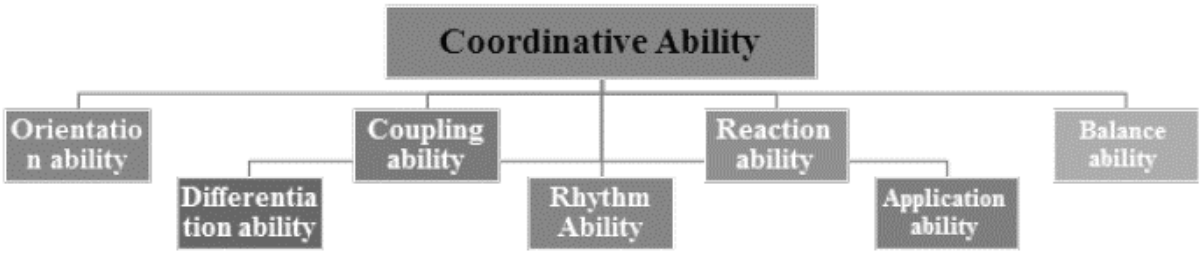
10.7 COORDINATIVE ABILITIES

Coordinative abilities are the abilities that help an individual perform movements **accurately, efficiently, and smoothly.**
They depend primarily on the **central nervous system's motor control and regulation**.

Zimmerman et al.:

"Coordinative abilities are generalized patterns of motor control that help in executing movements with better quality and effect."

10.7.1 Types of Coordinative Abilities



1. **Orientation Ability**
    - Ability to determine and adjust body position in space and time.
    - Important in games like **gymnastics, football, volleyball**.
    - Depends on **vision (including peripheral vision)**.
2. **Differentiation Ability**

- Ability to achieve **precise and fine movements**.
- Depends on **movement experience**.
- Example: sensing correct force in a basketball throw.

3. **Coupling Ability**
   - Ability to coordinate **different body parts** in a goal-directed movement.
   - Essential in **gymnastics, football, team sports**.
   - Example: dribbling in football while running.
4. **Rhythm Ability**
   - Ability to **recognize, reproduce, and synchronize movements with rhythm**.
   - Important in sports like **gymnastics, figure skating, dance**.
   - Can be internal (from memory) or external (like musiC).
5. **Reaction Ability**
   - Ability to respond quickly and correctly to a **stimulus** (visual, auditory, or tactile).
   - Types:
     - **Simple** (one stimulus, one response)
     - **Complex** (multiple stimuli and responses)
   - Example: starting race after the gunshot.
6. **Adaptation Ability**
   - Ability to **adjust or change** movement as per **changing situations**.
   - Example: reacting to an opponent's sudden move in badminton.
7. **Balance Ability**
   - Ability to **maintain or regain body equilibrium** during activity.
   - Two types:
     - **Static Balance**: Maintaining position (e.g., headstanD).
     - **Dynamic Balance**: Maintaining balance during movement (e.g., skiing).
   - Depends on **kinaesthetic, tactile, and vestibular senses**.

MULTIPLE CHOICE QUESTIONS 15 – SOLVED – 1 MARKS

1.Which of the following is not a component of physical fitness?

A) Strength B) Flexibility

C) Intelligence D) Endurance

Answer: C) Intelligence

2.Which training method is best suited to develop endurance?

A) Fartlek training B) Interval training

C) Resistance training D) Circuit training

Answer: A) Fartlek training

3.What does the term 'isometric exercise' mean?

A) Movement with resistance B) Static contraction without movement

C) Stretching and relaxing D) Movement without resistance

Answer: B) Static contraction without movement

4.Which fitness component is most required in gymnastics?

A) Strength B) Endurance

C) Flexibility D) Speed

Answer: C) Flexibility

5.What is the ideal repetition range to improve muscular strength?

A) 1–4 reps B) 5–8 reps

C) 12–15 reps D) 15–20 reps

Answer: B) 5–8 reps

6.Which training method involves changing terrain, pace, and intensity?

A) Circuit training B) Fartlek training

C) Plyometric training D) Interval training

Answer: B) Fartlek training

7.Which principle of training means “gradually increasing the workload”?

A) Specificity B) Progression

C) Overload D) Reversibility

Answer: C) Overload

8.Which component of fitness is most emphasized in sprinting?

A) Muscular endurance B) Flexibility

C) Speed D) Coordination

Answer: C) Speed

9.Which of the following is a measure of cardiovascular endurance?

A) Push-up test B) Sit-and-reach test

C) Cooper 12-minute run D) Vertical jump test

Answer: C) Cooper 12-minute run

10.The ability to change direction quickly is known as:

A) Power B) Speed

C) Agility D) Balance

Answer: C) Agility

11. Which training method is most suitable for beginners to build strength and endurance?

A) Fartlek training B) Circuit training

C) Interval training D) Isometric training

Answer: B) Circuit training

12.Which component is tested using the sit-and-reach test?

A) Speed B) Flexibility

C) Strength D) Endurance

Answer: B) Flexibility

13. Which type of strength is required to overcome resistance without body movement?

A) Dynamic strength B) Static strength

C) Explosive strength D) Maximum strength

Answer: B) Static strength

14. Interval training is effective for improving:

A) Flexibility B) Muscular endurance

C) Cardiovascular endurance D) Static balance

Answer: C) Cardiovascular endurance

15.Which training method uses explosive movements like jumps and bounds?

A) Plyometric training B) Circuit training

C) Fartlek training D) Resistance training

Answer: A) Plyometric training

UNSOLVED MCQS (1 MARKS)

1. **Which of the following is a method to develop speed?**
   A) Fartlek training B) Hollow sprints
   C) Circuit training D) Isometric exercise
2. **Explosive strength is most required in which of the following sports?**
   A) Marathon running B) Weightlifting
   C) Archery D) Chess
3. **Which component of fitness is tested by the 50-meter dash?**
   A) Flexibility B) Cardiovascular endurance
   C) Speed D) Muscular strength

4. **What does the principle of reversibility state?**
   A) Fitness improves only by rest B) Gains are lost when training stops
   C) Overloading is harmful D) Exercise should be general, not specific

5. **Which one of the following is *not* a type of strength?**
   A) Maximum strength B) Explosive strength
   C) Continuous strength D) Endurance strength

VERY SHORT ANSWER TYPE SOLVED QUESTIONS (2 MARKS EACH)

1. **Q:** What is strength?
   A: Strength is the ability of a muscle or group of muscles to overcome resistance or act against it.

2. **Q:** Define flexibility.
   A: Flexibility is the ability of joints to move through a full range of motion freely and comfortably.

3. **Q:** What is circuit training?
   A: Circuit training is a series of exercises performed in a sequence, targeting different muscle groups with minimal rest.

4. **Q:** What is endurance?
   A: Endurance is the ability of the body to sustain physical activity over a long period without fatigue.

5. **Q:** What is the difference between dynamic and static strength?
   A: Dynamic strength involves movement (e.g., lifting), while static strength involves holding a position without movement (e.g., planking).

6. **Q:** Name any two methods to develop endurance.
   A: Interval training and fartlek training.

7. **Q:** What is acceleration run?
   A: Acceleration run is a training method where the athlete gradually increases speed over a certain distance.

8. **Q:** What is explosive strength?
   A: Explosive strength is the ability to exert maximum force in a short time, such as in jumping or throwing.

9. **Q:** Mention any two components of physical fitness.
   A: Strength and speed.

10. **Q:** What is the overload principle in training?
    A: The overload principle involves increasing the intensity or duration of training to improve performance.

VERY SHORT ANSWER TYPE UNSOLVED QUESTIONS (2 MARKS EACH)

1. Define coordination ability with one example.:
2. Mention any two differences between interval training and fartlek training.
3. What is the principle of progression in physical training?
4. Name two tests used to measure flexibility and strength.
5. Why is speed important in sports? Give one example.

SOLVED SHORT ANSWER TYPE QUESTIONS (3 MARKS EACH)

Q1: Explain any three methods to develop endurance.

Interval Training: Alternating periods of high and low intensity to improve cardiovascular fitness.

Fartlek Training: Continuous running with speed variations, effective for stamina and pace control.

Continuous Training: Long-duration exercise at a steady pace to build aerobic endurance.

Q2: State three differences between isometric and isotonic exercises.

Feature	Isometric	Isotonic
Movement	No movement	Involves movement
Muscle length	Constant	Changes
Example	Plank	Push-up

Q3: Write any three benefits of circuit training.

- Improves overall fitness by targeting multiple muscle groups.
- Enhances both strength and endurance.
- Efficient use of time with minimal rest, promoting cardiovascular health.

Q4: What is speed? Name and explain any two types of speed.

- **Speed** is the ability to cover distance in minimum time.
- **Acceleration speed:** Ability to increase speed from a stationary position.
- **Reaction speed:** Time taken to respond to a stimulus.

Q5: Write three principles of physical training.

- **Overload:** Increase in training intensity to improve performance.
- **Specificity:** Training should be sport-specific.
- **Reversibility:** Gains can be lost if training is stopped.

Q6: Explain any three components of physical fitness.

- **Strength:** Ability to overcome resistance.
- **Flexibility:** Range of motion at joints.
- **Endurance:** Capacity to perform activities for long durations.

UNSOLVED SHORT ANSWER TYPE QUESTIONS (3 MARKS EACH)

Q1: Explain any three physiological benefits of regular training.

Q2: Write a short note on any three types of strength.

Q3: Define flexibility and explain two methods to improve it.

CASE-BASED SOLVED QUESTIONS (4 MARKS EACH)

Case 1:

Ravi is a 17-year-old athlete training for a 400m race. His coach has asked him to include interval training in his routine to improve cardiovascular endurance and recovery speed. Ravi trains in intervals of 200m sprinting with short breaks.

Q: Based on the above , answer the following:

A) What is the objective of interval training in Ravi's case?

B) Mention two benefits of interval training.

C) Name another training method useful for endurance development.

D)Why is interval training particularly useful for 400m runners?

Answer:

A) The objective is to improve cardiovascular endurance and increase recovery rate.

B) Enhances aerobic and anaerobic capacity

C) Fartlek training

D) Because it develops both speed and endurance, crucial for sustained high-intensity performance in a 400m race.

Case 2:

Case:

Neha is preparing for a yoga competition and has been advised to improve her flexibility. Her trainer suggests practicing static stretching and PNF techniques regularly.

Q:

A) What is static stretching?

B) How does PNF technique help improve flexibility?

C) Why is flexibility important in yoga?

D) Give one example of a static stretch Neha might use.

Answer:

A) Static stretching involves holding a stretch for a prolonged period without movement.

B) PNF helps by contracting and relaxing muscles, leading to deeper stretching.

C) Flexibility improves posture, reduces injury risk, and enhances performance in yoga poses.

D) A seated hamstring stretch where she reaches forward to touch her toes and holds the position

Case 3:

Case:

A football coach is designing a training program for his team. He includes plyometric exercises to build explosive strength, circuit training for overall conditioning, and agility drills.

Q:

A) What is the purpose of plyometric exercises?

B) Why is circuit training effective for football players?

C) Mention any one agility drill used in football training.

D) How do agility drills benefit football players on the field?

Answer:

A) To develop explosive power in muscles, useful for jumping, kicking, and sprinting.

B) Circuit training improves muscular strength, endurance, and aerobic fitness.

C) Ladder drills (e.g., side steps or high knees through an agility ladder).

D) They improve quick direction changes, balance, and coordination, essential for dribbling, tackling, and evading opponents.

Case 4:

Case:

Arjun, a long-distance runner, has been experiencing fatigue during his races. His coach analyzes his training and finds that he is not following the principle of overload or progression.

Q:

A) What is the overload principle in training?

B) What is meant by progression in training?

C) Suggest two reasons why fatigue may occur if these principles are ignored.

D) What could be a sign that Arjun's training lacks progression?

Answer:

A) Overload means gradually increasing the training load to improve performance.

B) Progression is the systematic increase in intensity, duration, or frequency of training.

C) Lack of adaptation due to undertraining

D) Plateau in performance or no improvement in race times despite regular training.

CASE-BASED UNSOLVED QUESTIONS (4 MARKS EACH)

Case 1:

Sunita is a sprinter training for the 100m event. Her coach includes reaction drills, acceleration sprints, and hollow sprints in her routine.

Q:

A) Why are reaction drills important in sprinting?

B) What is a hollow sprint?

C) How do these methods help improve speed?

D) Why is acceleration important in the 100m sprint?

Case 2:

A group of school athletes is undergoing circuit training twice a week. The coach includes a mix of jumping, push-ups, shuttle runs, and crunches in the circuit.

Q:

A) What is the main objective of circuit training?

B) List two advantages of using a circuit training method in schools.

C) How does circuit training contribute to fitness development?

D) Why is circuit training suitable for young athletes?

SOLVED LONG ANSWER TYPE QUESTIONS (5 MARKS EACH)

1: Explain in detail any five types of coordinative abilities with suitable examples.

Answer:

1. **Orientation Ability** – It is the ability to determine and change the position of the body in space.
   Example: A football player tracking the ball while dribbling.
2. **Differentiation Ability** – This is the ability to achieve precision in movement with minimum effort.
   Example: A badminton player using a delicate drop shot.
3. **Coupling Ability** – The ability to coordinate different body parts simultaneously.
   Example: In cricket, synchronizing hand movement for catching while running.
4. **Reaction Ability** – The ability to respond quickly and effectively to a stimulus.
   Example: A sprinter responding to the starting gun.
5. **Balance Ability** – It is the ability to maintain body equilibrium in both static and dynamic positions.
   Example: A gymnast performing on a balance beam.

2: Define flexibility. Explain any four methods to improve flexibility.

Answer:

Flexibility is the range of motion around a joint and its surrounding muscles.

Methods to Improve Flexibility:

1. **Slow Stretching** – Stretching muscles gradually without jerky movements.
2. **Slow Stretch and Hold** – Reaching maximum stretch and holding it for 10–30 seconds.
3. **Ballistic Method** – Bouncing or rhythmic movements to extend the range of motion (used with caution).
4. **PNF Technique** – Involves contracting and then stretching the muscles for better flexibility.

3: Describe the various methods to develop endurance and explain their benefits.

Answer:

1. **Continuous Training:**
   - Involves exercising at a steady pace without rest (e.g., jogging for 30 minutes).
   - **Benefits:** Improves cardiovascular efficiency and aerobic capacity.
2. **Interval Training:**
   - Alternating periods of intense activity with rest (e.g., 400m sprint followed by rest).
   - **Benefits:** Enhances both aerobic and anaerobic endurance.
3. **Fartlek Training:**
   - A combination of slow and fast running over natural terrain.

- **Benefits:** Improves stamina, recovery, and pacing strategies.

4. **Circuit Training:**
   - A series of exercises performed one after the other targeting different body parts.
   - **Benefits:** Builds muscular and cardiovascular endurance simultaneously.
5. **Cross Training:**
   - Involves different types of exercise to work various muscles (e.g., swimming + cycling).
   - **Benefits:** Reduces boredom, prevents overuse injuries, and develops overall fitness.

UNSOLVED LONG ANSWER TYPE QUESTIONS (5 MARKS EACH)

1: Define speed. Explain any four methods to develop speed with examples.

2: What is strength? Explain its types and any three methods to develop it.

SAMPLE PAPER -1

SAMPLE PAPER-01 - BLUE PRINT
PHYSICAL EDUCATION (048)

Unit NO	UNIT Name	Weightag of Marks Alloted					
		SECTION -A	SECTION -B	SECTION -C	SECTION -D	SECTION -E	
		1 Mark	2 Marks	3 Marks	4 marks	5Marks	
		No of Questions	No of Questions	No of Questions	No of Questions	No of Questions	Total No of question
UNIT 1	Management of Sporting events	1	1	1	0	1 (choice)	3
UNIT 2	Children and Women in Sports	1+1+1			1		4
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	1+1		1	1		4
UNIT 4	Physical Education & Sports for CWSN	1+1+1	1		0		4
UNIT 5	Sports & Nutrition	1+1+1	1(choice)	1	0		4
UNIT 6	Test & Measurment in Sports	1	1		0	1	3
UNIT 7	Physiology & Injuries in sports	1+1	1	1 (choice)	0		3
UNIT 8	Biomechanics & Sports	1	1		1		3
UNIT 9	Psychology & Sports	1		1	0	1	3
UNIT 10	Training in Sports	1		1	0	1	3
No of questions		18	5	5	3	3	
Question Sno 1 to 34		1 to 18	19 to 24(CHOICE)	25 to 30 (CHOICE)	31 to 33	33 to 37 (CHOICE)	

SAMPLE PAPER-01
PHYSICAL EDUCATION (048)
CLASS XII

Time allowed: 03 hours Maximum Marks: 70

General Instructions:

a) The question paper consists of 5 sections and 37 questions
b) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.
c) Section B consists of questions 19-24 carrying 2 marks each and are very short answers type and their answers should not exceed 60-90 words. Attempt any 5.
d) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.
e) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an Internal choice available.
f) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3.

SECTION A
(All questions are compulsory)

1. The total number of matches in a knockout tournament for 34 teams are_____ (A) 31 (B) 32 (C) 33 (D) 35

2. Scoliosis is a postural deformity related to _____
A. Muscles B. Shoulder C. Legs D. Spine

3. What is menarche?
A. First period B. Last period C. Monthly pain D. Exercise routine

4. In which Olympics did women participate for the first time?
A. 1896 B. 1900 C. 1904 D. 1908

5. What is the meaning of "Asana" in Yoga?
(A) breathing exercises (B) physical postures
(C) meditation techniques (D) ethical practices

6.  pose refers to :

a. Camel pose b. Cow pose
c. Fish pose d. Cobra pose

7. What does CWSN stand for?
A) Children with Sports Needs B) Children with Special Needs
C) Children with Serious Needs D) Children with Special Nutrition

8. The term 'Inclusive' means:
A) To isolate B) To expel C) To include D) To avoid

9. Special schools are meant for:
A) Athletes B) General public

C) Children with disabilities D) Teachers

10. What is the main source of energy for athletes?
A) Protein B) Carbohydrates C) Vitamins D) Minerals

11. Which mineral is essential for bone health?
A) Zinc B) Calcium C) Iron D) Sodium

12. Which vitamin is produced in the body with sunlight exposure?
A) Vitamin A B) Vitamin B12 C) Vitamin D D) Vitamin K

13. Assertion (A): The HARVARD Step Test is a commonly used method to measure cardiovascular endurance.

Reason (R): It assesses the efficiency of the circulatory system by measuring the heart rate recovery after a standardized exercise.

Choose the correct option:
A) Both A and R are true, and R is the correct explanation of A.
B) Both A and R are true, but R is not the correct explanation of A.
C) A is true, but R is false.
D) A is false, but R is true.

14. The muscle fiber type most helpful in long-distance running is:

A) Type II-a B) Type II-b C) Type I D) Mixed Fibre

15. Biomechanics is the study of:

A) Anatomy B) Muscles C) Forces and movement in living systems D) Nervous system

16. Lactic acid is produced during:
A) Aerobic respiration B) Walking slowly
C) Anaerobic glycolysis D) Sleep

17. Which of the following is NOT a dimension of personality?

A. Openness B. Conscientiousness
C. Motivation D. Neuroticism

18. Assertion (A): Intelligence is not considered a component of physical fitness.

Reason (R): Physical fitness primarily relates to the body's ability to perform physical activity, while intelligence pertains to cognitive abilities such as problem-solving and learning.

Choose the correct option:
A) Both A and R are true, and R is the correct explanation of A.
B) Both A and R are true, but R is not the correct explanation of A.
C) A is true, but R is false.
D) A is false, but R is true.

SECTION – B
(Answer any Five)

19. What is planning in games and sports?
20. What is inclusive education?
21. Write a short notes on role of Bio mechanics in Sports?
22. Define Test and Measurement?
23. Explain what is Exercise physiology and write two points of its importance.
24. Describe Balance Diet?

SECTION – C
(Answer any Five)

25. Write the names and duties of various committees.
26. What is the importance of sports psychology?
27. Explain any three features of inclusive education.
28. Explain the differences between slow-twitch and fast-twitch muscle fibers.
29. : Explain any three methods to develop endurance.
30. . Explain the procedure of Pawanmuktasana.

SECTION – D
(All questions are compulsory)

31.Anita, a 17-year-old long-distance runner, has been training intensively for national competitions. Despite her dedication, she hasn't had her menstrual cycle for the last four months. Her coach is concerned, as Anita also reports fatigue, low energy, and frequent leg cramps. Upon consulting a sports physician, she is diagnosed with amenorrhea, a component of the Female Athlete Triad.

1. What are the three components of the Female Athlete Triad?

A) Low energy, high metabolism, low BMI
B) Amenorrhea, osteoporosis, disordered eating
C) Menstrual cramps, low BMD, and obesity
D) None of the above

2. What is the likely cause of Anita's amenorrhea?

a) High protein intake
B) Poor water consumption
C) Energy imbalance due to overtraining and low-calorie intake
D) Excess sleep

3. Which of the following is a long-term risk of ignoring menstrual dysfunction?

A) Weaker muscles
B) Blurriness
C) Weak bone health and stress fractures
D) Less flexibility

32. Gunjan, a Yoga instructor at XYZ School was consulted by a student of class XI in relation to her over weight. The child wants to do asanas to reduce her weight.

A. Gunjan has asked the child to practice_____

A) Paschimottanasana B) Gomukhasana
C) Chakrasana D) Vajrasana

B. While practicing this asana child should not be suffering from_____
A) Joint pain B) High BP
C) Scurvy D) Constipation

C. This asana is _____ asana.
A) Standing B) Relaxative
C) Meditative D) Lying

33. A footballer is performing a bicep curl during strength training.

Based on above situration, answer to the following questions.

A) Fill in the blank: The _____ joint acts as the fulcrum.

B) True or False: This is an example of a first-class lever.

C) Match the component with body part:

Fulcrum → Elbow

Effort → Biceps

D) Name the class of lever demonstrated her

SECTION – E

(Answer any Three)

34. Explain SAI Khelo India Fitness test for age group 9-18 yrs age group.

35. Explain the concept of aggression in sports and its types.

36. Explain in detail any five types of coordinative abilities with suitable examples.

37. Mention 5 important committees to conduct a one-day Health Run and discuss their responsibilities.

SAMPLE PAPER -2

SAMPLE PAPER -2							
BLUE PRINT							
Unit NO	UNIT Name	Weightage of Marks Alloted					
		SECTION-A	SECTION-B	SECTION-C	SECTION-D	SECTION-E	
		1 Mark	2 Marks	3 Marks	4 marks	5Marks	
		No of Questions	No of Questions	No of Questions	No of Questions	No of Questions	Total No of question
UNIT 1	Management of Sporting events	1	1	1			3
UNIT 2	Children and Women in Sports	2	1	1			4
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	2			1		3
UNIT 4	Physical Education & Sports for CWSN	2		1			3
UNIT 5	Sports & Nutrition	3			1		4
UNIT 6	Test & Measurment in Sports	1	1			1	3
UNIT 7	Physiology & Injuries in sports	1	1	1			3
UNIT 8	Biomechanics & Sports	3			1		4
UNIT 9	Psychology & Sports	2	1			1	4
UNIT 10	Training in Sports	1		1		1	3
No of questions		18	5	5	3	3	
Question Sno 1 to 34		1 to 18	19 to 24 (CHOICE)	25 to 30 (CHOICE)	31 to 33	33 to 37 (CHOICE)	

SAMPLE PAPER-02
PHYSICAL EDUCATION (048)
CLASS XII

Time allowed: 03 hours **Maximum Marks: 70**

General Instructions:

g) The question paper consists of 5 sections and 37 questions

h) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.

i) Section B consists of questions 19-24 carrying 2 marks each and are very short answers type and their answers should not exceed 60-90 words. Attempt any 5.

j) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.

k) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an internal choice available.

l) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3**.**

SECTION – A
(All questions are compulsory)

1) What is the formula to calculate the number of matches in a single league tournament?
(A) N-1 (B) N (N-1). (C) N (N-1)/2 (D) 2N-N

2) Which domain involves emotional growth?
A. Physical B. Affective C. Cognitive D. Psychomotor

3) Amenorrhea means:
A. Heavy bleeding B. No periods C. Shorter cycle D. Painful periods

4) Which asana is known as the "Diamond Pose"?
(A) Trikonasana (B) Vajrasana (C) Tadasana (D) Shavasana

5) Ardha Mastendrasana is a _____ pose?
a. Standing b. lying c. side twisting d. forward bending

6) Which of the following is a type of disability?
A) Hearing Impairment B) Visual Impairment
C) Intellectual Disability D) All of the above

7) Cerebral palsy mainly affects**:**
A) Vision B) Hearing C) Movement and posture D) Heart

8) Which nutrient is primarily responsible for muscle repair?
A) Fats B) Carbohydrates C) Proteins D) Water

9) Constituents of balanced diet:

A) Only plant-based foods B) Equal portions of carbohydrates and fats only

C) All nutrients in proper proportions D) Only protein-rich foods

10) Which nutrient helps in the absorption of fat-soluble vitamins?

A) Water B) Carbohydrates C) Fats D) Proteins

11) The 'Sit and Reach Test' is primarily used to assess:

A. Muscular Strength B. Flexibility Agility D. Endurance

12) Which energy system provides energy for a 100m sprint?

A) Aerobic system B) Anaerobic system C) Lactic system D) ATP-CP system

13) Which law of motion is also called the "Law of Inertia"?

A) Second Law B) First Law C) Third Law D) Fourth Law

14) Centre of Gravity is important because:

A) It reduces weight B) It improves performance

C) It helps in balance and control D) none of the above

15) Which of the following is doesn't belongs to friction?

A) Static B) Rolling C) Twisting D) Sliding

16) Which type of personality is more prone to stress and anxiety?

A. Type A B. Type B

C. Extrovert D. Introvert

17) Which type of motivation is based on receiving trophies or medals?

A. Intrinsic B. Internal C. Extrinsic D. Mental

18) **which training method is best suited to develop endurance?**

A) Fartlek training B) Interval training

C) Resistance training D) Circuit training

SECTION – B
(Attempt any 5 questions)

19. What is knock-out tournament?

20. What is amenorrhea and how does it affect female athletes?

21. How is 'measurement' defined in the context of sports?

22. Explain about emotional dimension of personality in detail.

23. What are slow-twitch muscle fibers?

24. Explain spectators as source of motivation.

SECTION – C

(Attempt any 5 questions)

25. Discuss any two important tournaments.

26. Describe any three common postural deformities.

27. Describe the ATP-CP energy system and give two examples where it is used.

28. State three objectives of the Special Olympics.

29. State three differences between isometric and isotonic exercises

30. Mention three healthy eating habits that promote long-term health.

SECTION – D
(Internal choice available)

31. Geetha, the yoga teacher does regular yoga activities in her house with family. It helps to improve her family health. One day her neighbour, Sheela came to her house with her daughter. Sheela's daughter is 14 but has short height. Geetha advised her to do some asanas regularly to increase her height.

    1. Which asana can be advised by Geeta?
    2. Vajrasana helps to relieve from
    3. Which asana can be used to cure obesity?

32. Meena is a 16-year-old athlete who recently started experiencing bloating and stomach cramps after drinking milk. Her doctor diagnosed her with lactose intolerance.

Q1. What is lactose intolerance?
Q2. Suggest two alternatives for Meena to maintain her calcium intake.

33. Equilibrium During a gymnastics competition, Riya performs a balance beam routine. She maintains perfect posture and control throughout, especially while standing on one leg during a spin. Her coach explains that her ability to stay stable during movement is due to her excellent sense of equilibrium and body alignment.

A) Fill in the blank: This is an example of _____ equilibrium.

B) Identify one biomechanical factor that helps Riya maintain balance during the spin...

C) Match:

Static Equilibrium →	Handstand
Dynamic Equilibrium →	cycling at constant speed
No Equilibrium →	Falling athlete

D) Why is low Centre of Gravity important in such activities?

SECTION – D
(Internal choice available)

34. Explain in detail the HARVARD Step Test. Mention its purpose, procedure, advantages of the Test

35. Discuss the benefits of exercise and physical activity on mental health and well-being.

36. Define flexibility. Explain any four methods to improve flexibility.

37. Write in detail about the importance of equilibrium and Centre of Gravity in enhancing sports performance.

SAMPLE PAPER -3

SAMPLE PAPER -3							
Unit NO	UNIT Name	BLUE PRINT					
		SECTION-A	SECTION-B	SECTION-C	SECTION-D	SECTION-E	
		1 Mark	2 Marks	3 Marks	4 marks	5Marks	
		No of Questions	No of Questions	No of Questions	No of Questions	No of Questions	Total No of question
UNIT 1	Management of Sporting events	1	1		1		3
UNIT 2	Children and Women in Sports	2	1	1			4
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	2			1		3
UNIT 4	Physical Education & Sports for CWSN	2		1			3
UNIT 5	Sports & Nutrition	3		1			4
UNIT 6	Test & Measurment in Sports	1	1			1	3
UNIT 7	Physiology & Injuries in sports	1	1	1			3
UNIT 8	Biomechanics & Sports	3				1	4
UNIT 9	Psychology & Sports	2	1		1		4
UNIT 10	Training in Sports	1		1		1	3
No of questions		18	5	5	3	3	
Question Sno 1 to 34		1 to 18	19 to 24(CHOICE)	25 to 30 (CHOICE)	31 to 33	34 to 37 (CHOICE)	

SAMPLE PAPER - 3
KENDRIYA VIDYALAYA SANGATHAN
PHYSICAL EDUCATION (048)
CLASS XII

General Instructions:

m) The question paper consists of 5 sections and 37 questions
n) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.
o) Section B consists of questions 19-24 carrying 2 marks each and are very short answers type and their answers should not exceed 60-90 words. Attempt any 5.
p) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.
q) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an Internal choice available.
r) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3.

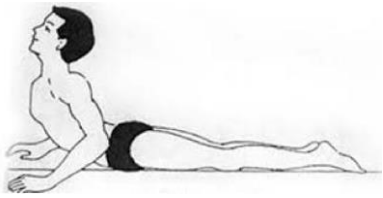
SECTION – A
(All questions are compulsory)

1. Which one of the following is an advantage in the round robin tournament?
   (A) Time consuming (B) More number of officials
   (C) Expensive. (D) Decides the real strong team

2. Sakshi Malik won a medal in
   (A) Badminton (B) Chess (C) Wrestling (D) Weightlifting

3. Which is NOT a part of the Female Athlete Triad?
   (A) Low energy (B) Eating disorder (C) Strong bones (D) Amenorrhea

4. Identify the asana in the picture?



   (A) Vajrasana (B) Trikonasana
   (C) Ardha Matsyendrasana (D) Bhujangasana

5. Which asana is of side twist pose?
   (A) Shavasana (B) Chakrasana
   (C) Ardha Mastendrasana (D) Parvatasana

6. Inclusive education means:
   (A) Teaching only disabled students
   (B) Excluding students with disabilities
   (C) Integrating children with special needs in regular classrooms
   (D) Special schools for the disabled

7. Which program helps to integrate CWSN into mainstream education?

(A) Mid-Day Meal Scheme (B) Samagra Shiksha Abhiyan
(C) Khelo India (D) Fit India Movement

8. Which one of the following is a micronutrient?

A) Protein B) Fat C) Vitamin C D) Carbohydrate

9. A balanced diet includes:

A) Only plant-based foods B) Equal portions of carbohydrates and fats only
C) All nutrients in proper proportions D) Only protein-rich foods

10. Which one of the following is a good source of protein for vegetarians?

A) Chicken B) Eggs C) Lentils D) Fish

11. Which test is used to measure abdominal strength?

A) Pull-Up Test B) 600 Meter Run
C) Sit-Up Test D) Shuttle Run

12. VO_2 Max refers to:

A) Maximum number of heartbeats B) Volume of food intake
C) Maximum oxygen consumed during exercise D) Breathing rate at rest

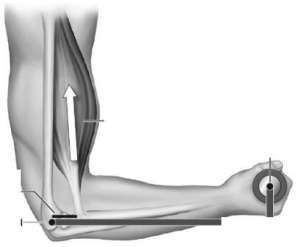
13. The equation F = ma represents:

A) Law of Inertia B) Law of Gravity
C) Law of Acceleration D) Law of Friction

14. Centre of Gravity is important because:

A) It reduces weight B) It improves speed
C) It helps in balance and control D) None of the above

15. In a bicep curl, which part acts as the fulcrum?



A) Elbow joint B) Shoulder joint
C) Wrist D) Finger

16. What does 'sports psychology' primarily focus on?

A. Fitness programs B. Rules of sports
C. Psychological aspects affecting performance D. Sports injuries

17. The 'Inverted-U Theory' relates to:

A. Motivation and rewards B. Personality development
C. Stress and relaxation D. Arousal and performance

18. What does the term 'isometric exercise' mean?

A) Movement with resistance B) Static contraction without movement

C) Stretching and relaxing D) Movement without resistance

SECTION – B

(Attempt any 5 questions)

19. What is a bye?
20. Mention any two benefits of regular physical activity in children.
21. Mention one key objective of conducting tests and measurements in sports.
22. What is the anaerobic energy system?
23. Explain spectators as source of motivation.
24. Define a lever and name its three components

SECTION – C

(Attempt any 5 questions)

25. Describe any three common postural deformities.
26. How can physical education teachers support CWSN in sports activities?
27. How does hydration affect sports performance?
28. What are the short-term effects of exercise on the muscular system?
29. Write any three benefits of circuit training.
30. Describe the factors affecting projectile motion in sports.

SECTION – D

(Internal choice available)

31. ABC School has been given the responsibility to conduct a CHSE Zonal Volleyball competition. As of students to help teacher in-charges for smooth conduct of the tournament. Based on the case answer the given question

(1) To help the teams and to know about their food and stay arrangements, a group of students will be assigned with committee.

(A) Transport (B) Boarding and lodging (C) Registration D) Decoration

(2) Students good at art and craft and creative designing will be assigned with committee

(A) Reception (B) Decoration (C) Entertainment (D) Registration

(3) Few students will be assigned as_____ during sports meet for helping the participants in various works

(A) Reception (B) Transport (C) Registration (D) Volunteers

(4) When we have large number of entries, which kind of tournament can be conducted to completed in stipulated time?

(A) Knock tournament (B) League (C) Combination (D) Challenge

32. A 25-year-old individual with asthma is seeking to manage their symptoms through yoga. Design a yoga program that includes asanas, pranayama, and relaxation techniques to improve lung function, reduce stress, and enhance overall well-being.

OR

A 40-year-old individual with type 2 diabetes is looking to incorporate yoga into their management plan. Create a yoga routine that includes asanas, pranayama, and relaxation techniques to improve insulin sensitivity, reduce stress, and enhance overall well-being.

33. Read the following Case Study carefully answer the questions.

A state sports team was winning all the tournaments and was highly praised for its efforts. An interview with the team to find and explore the reasons for its continuous success highlighted the following reasons. As per the report,

- The Captain had been selected by the team members themselves, and he was most interactive, sociable and optimistic on the field as well as off it. This made him a good leader. The best part of the team was that, all its senior players were helpful and cooperative with their juniors and were always willing to listen to them.
- The team's coach mentioned few essential elements that had contributed to the team's success. According to him, the ability to motivate people plays a crucial role in the team's success more often than the technical skills, and this is what separates a good coach from an average one.
- The team's psychologist spoke about the aggressive behaviour among the team players against the opponents. It was interesting to listen to various instances where the players had instigated opponents or charged at them violently, in anger, but had later tried to justify their actions.

  Sometimes, players were found to be abusing opponents not in anger, but to get an advantage or for the sake of winning, though this behaviour is not acceptable and they were awarded punishments as per the code of conduct and rules of sport.

Read the above story of a sports team and answer the following questions?

1. Which trait best reflected the personality of junior players?

(A) Introvert (B) Conscientiousness (C) Neuroticism

2. Which member of the team reflected most of the Extrovert traits?

(A) Coach (B) New Members (C) Captain

3. Which type of players were recommended for special training with Sports Psychologist?

(A) Extrovert (A) Introvert (A) Mesomorph

4. The team sports psychologist is referring to which type of behaviour as non-threatening but confident.

(A) Assertive (A) Hostile (A) Instrumental

SECTION – E

(Attempt any 3 questions)

34. Write a detailed note on the importance and objectives of test and measurement in physical education and sports.
35. Describe different types of levers in the human body. Explain its application in sports
36. Describe the various methods to develop endurance and explain their benefits.
37. Explain the purpose and procedures of the Rikli & Jones Senior Citizen Fitness Test.

SAMPLE PAPER -4

SAMPLE PAPER - 4

Unit NO	UNIT Name	BLUE PRINT					
		SECTION-A	SECTION-B	SECTION-C	SECTION-D	SECTION-E	
		1 Mark	2 Marks	3 Marks	4 marks	5Marks	
		No of Questions	No of Questions	No of Questions	No of Questions	No of Questions	Total No of question
UNIT 1	Management of Sporting events	2	0	1	0	0	3
UNIT 2	Children and Women in Sports	1	1	1		1	4
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	2	0	1	0	0	3
UNIT 4	Physical Education & Sports for CWSN	2	1	1	0	0	4
UNIT 5	Sports & Nutrition	2	0	0	0	1	3
UNIT 6	Test & Measurment in Sports	2	1	0	1	0	4
UNIT 7	Physiology & Injuries in sports	1	1	0	1	0	3
UNIT 8	Biomechanics & Sports	2	0	1	1	1	5
UNIT 9	Psychology & Sports	2	1	1		0	4
UNIT 10	Training in Sports	2	1	0		1	4
No of questions		18	5	5	3	3	
Question Sno 1 to 34		**1 to 18**	**19 to 24(CHOICE)**	**25 to 30 (CHOICE)**	**31 to 33**	**33 to 37 (CHOICE)**	

SAMPLE PAPER-04
PHYSICAL EDUCATION (048)
CLASS XII

Time allowed: 03 hours **Maximum Marks: 70**

General Instructions:

s) The question paper consists of 5 sections and 37 questions

t) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.

u) Section B consists of questions 19-24 carrying 2 marks each and are very short answers type and their answers should not exceed 60-90 words. Attempt any 5.

v) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.

w) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an Internal choice available.

x) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3**.**

SECTION – A
(All questions are compulsory)

1. **When a team is directly participating in quarter/semi-final due to its win in previous tournament**?
is due to _____

(A) seeding (B) bye (C) robin round (D) Special seeding

2. What is the formula for calculating number matches in single knock out tournament?

(A) 2N-1 (B) N-1 (C) N-2 (D) N-3

3. How much physical activity is recommended daily for a 10-year-old child?

A. 20 minutes B. 30 minutes C. 60 minutes D. 90 minutes

4. Name the asana shown in the picture given below?

(A) Vajrasana (B) Pachimotanasana
(C) Trikonasana (D) Ardha Matsyendrasana

5. What causes Obesity?

a. Non-Activity b. Smoking
c. Over indulgence in food d. All of the above

6. Which law ensures education for all children in India?

A) RTE Act, 2009 B) Disabilities Act, 1995
C) PWD Act, 2016 D) Sports Policy, 2001

7. The Paralympics is held after every:

A) 2 years B) 3 years C) 4 years D) 1 year

8. Assertion (A): Vitamins are crucial for various metabolic processes in the human body.

Reason (R): They serve as primary sources of energy for cellular activities.

A. A is true, R is false.

B. A is true, R is true but R is not the correct explanation of A.

C. A is true, R is true and R is the correct explanation of A.

D. A is false, R is true.

9. Which of the following nutrients is the body's primary and most readily available source of energy during exercise, especially during high-intensity activities?

A) Fats B) Proteins C) Carbohydrates D) Vitamins

10. Which test is suitable for assessing agility in school children?

A. 50 Meter Sprint B. Shuttle Run
C. Vertical Jump D. Skinfold Measurement

11. The term 'test' in physical education refers to:

E. A final exam B. A tool to evaluate skill and fitness levels
C. A written questionnaire D. A set of sports rules

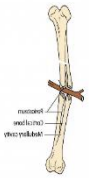
12. Examine the diagram below which illustrates a bone fracture. Which type of fracture does this diagram most accurately represent?

(A) Transverse fracture

(B) Oblique fracture

(C) Comminuted fracture

(D) Greenstick fracture



13. **When a footballer kicks a ball, which Newton's law is applied?**

A) First B) Second C) Third D) Both 1 and 2

14. **Which sport best demonstrates the third law of motion?**

A) Golf B) Swimming C) Darts D) Archery

15**. Intrinsic motivation is driven by:**

a. External rewards b. Fear of punishment
c. Internal satisfaction d. Public pressure

16. **Which type of motivation is based on receiving trophies or medals?**

A). Intrinsic B). Internal C). Extrinsic D). Mental

17. **Which fitness component is most required in gymnastics?**

A) Strength B) Endurance C) Flexibility D) Speed

18. Which training method is most suitable for beginners to build strength and endurance?

A) Fartlek training B) Circuit training C) Interval training D) Isometric training

SECTION – B
(Attempt any 5 questions)

19. What are knock knees and name one corrective measure?

20. Name two types of physical disabilities.

21. Which test helps in evaluating heart and lung endurance?

22. Name the three energy systems?

23. Discuss intrinsic and extrinsic motivation

24. What is endurance?

SECTION – C
(Attempt any 5 questions)

25. What do you mean by extramural?

26. How does poor posture affect the body? Give three effects.

27. Explain briefly Diabetes.

28. Describe three ways physical activity benefits children with intellectual disabilities

29. Explain goal setting as a technique of motivation in brief.

30. How does Centre of Gravity affect performance and injury prevention?

SECTION – D
(Internal choice available)

31. Case Study: Anuj's Fitness Journey in Mysuru

Anuj, a 30-year-old software engineer in mysuru, has successfully completed a comprehensive baseline fitness assessment covering his strength, flexibility, endurance, and agility. he diligently performed the push-up test, plank hold, standing broad jump for strength; sit-and-reach, back scratch, and an overhead squat self-assessment for flexibility; the 1.5-mile run, step test, sit-up test, and wall sit for endurance; and the 5-10-5 shuttle run and a simplified t-test for agility. he has meticulously recorded all his scores.

now, anuj looks at his results and, while happy to have a baseline, realizes some areas are significantly weaker than others, especially his flexibility and core strength, while his endurance is moderately good. he wants to leverage this data to create a practical, sustainable fitness plan.

1. What test did Anuj perform to measure his agility?

2. What type of fitness assessment did Anuj complete?

3. How would Anuj describe his endurance level based on his assessment?

4. Which test did Anuj use to evaluate his flexibility?

32. Case Study 2:

Rahul Chaudhari slipped during a kabaddi match and twisted his ankle. his coach immediately applied the PRICE method to treat the injury.

1. What type of injury has Rahul Chaudhari likely suffered?

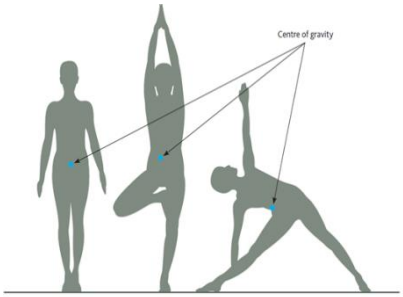
2. What does "C" in PRICE stand for?

3. True or False: A fracture is a soft tissue injury.

4. Fill in the blank: _____ should be done to stop further movement

33. Case Study 3: Centre of Gravity

A Basketball player lowers body while defending



1. Fill in the blank: A _____ COG increases stability.

2. True or False: Narrow base of support to helps maintain balance.

3. Match: Low COG → High stability

Wide base → Better balance

Line of Gravity inside base → Stable position

4. Why is controlling COG important in invasion sports?

SECTION – E
(Attempt any 3 questions)

34. Describe in detail the role of nutrition, training, and rest in preventing menstrual dysfunction among female athletes?

35. Describe the role of nutrition in maintaining physical fitness. How does poor nutrition affect athletic performance?

36. Write in detail about the importance of equilibrium and Centre of Gravity in enhancing sports performance?

37. Define speed. Explain any four methods to develop speed with suitable examples?

SAMPLE PAPER-05

SAMPLE PAPER -5							
BLUE PRINT							
Unit NO	UNIT Name	Weightag of Marks Alloted					
		SECTION-A	SECTION-B	SECTION-C	SECTION-D	SECTION-E	
		1 Mark	2 Marks	3 Marks	4 marks	5Marks	
		No of Questions	No of Questions	No of Questions	No of Questions	No of Questions	Total No of question
UNIT 1	Management of Sporting events	2		1			3
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UNIT 7	Physiology & Injuries in sports	2	1	1			4
UNIT 8	Biomechanics & Sports	2	1		1		4
UNIT 9	Psychology & Sports	1				1	2
UNIT 10	Training in Sports	1		1		1	3
No of questions		18	5	5	3	3	
Question Sno 1 to 34		1 to 18	19 to 24 (CHOICE)	25 to 30 (CHOICE)	31 to 33	34 to 37 (CHOICE)	

SAMPLE PAPER -05
KENDRIYA VIDYALAYA SANGATHAN (NEW DELHI)
PHYSICAL EDUCATION (048)
CLASS XII

General Instructions:

y) The question paper consists of 5 sections and 37 questions
z) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.
aa) Section B consists of questions 19-24 carrying 2 marks each and are very short answers type and their answers should not exceed 60-90 words. Attempt any 5.
bb) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.
cc) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an internal choice available.
dd) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3.

SECTION – A
(All questions are compulsory)

1. Identify the parts of sports management?
A. Planning B. Organizing and staffing
C. Directing and controlling D. All of the above

2. Seeding method helps in elimination of……..
A. Weak team B. Strong team
C. Favourite team D. Local team

3. Type of exercises recommended for adults 18–64 years are _____ .
A. Only yoga B. light walking
C. No need for activity D. 150–300 mins of moderate activity

4. _____ is not a part of the Female Athlete Triad?
A. Low energy B. Eating disorder
C. Strong bones D. Amenorrhea

5. Which of the following asanas is recommended for strengthening pelvic muscles?
A. Shavasana B. Trikonasana
C. Tadasana D.Vajrasana

6. The gland that secretes the hormone insulin, the lack of which is associated with Diabetes?
A. Endocrine glands B. Pituitary
C. Pancreas D. Hypothalmus

7. Hypertension is caused due to ?

A. Excessive insulin secretion B. Smoke
C. Food D. All of the above

8. Special Olympics are organized for:
A. Athletes under 14 B. Women athletes only
C. Children with special needs D. None of these

9. Which of the following is an example of food, rich in fats?
A. Apple B. Olive oil
C. Rice D. Lentils

10. The most essential recommended nutrient for hydration in athletes?
A. Protein B. Calcium
C. Water D. Fat

11. What is the primary purpose of measurement in physical education?
A. To compete with others
B. To evaluate physical fitness and performance
C. To assess academic performance
D. To determine grades in other subjects

12. Back scratch test is used to test fitness of
A. Lower body part B. Shoulder only
C. Upper body part D. Elbows only

13. Muscle hypertrophy occurs due to ___
A. Flexibility training B. Overeating
C. Regular strength training D. Excess rest

14. Strength depends largely on:
A. Lung capacity B. Myoglobin
C. Fast-twitch fibers D. Skin thickness

15. In which type of lever, load is located between effort and fulcrum?
A. First-class B. Second-class
C. Third-class D. Fourth-class

16. In biomechanics, “E” in the lever system stands for:
A. Energy B. Edge
C. Effort D. Equilibrium

17. What is the term for the process of setting specific, measurable, achievable, relevant, and time-bound goals?
A. Self-talk B. Goal setting
C. Mental imagery D. Positive reinforcement

18. What is the ideal repetition range to improve muscular strength?
A. 1–4 reps B. 5–8 reps
C. 12–15 reps D. 15–20 reps

SECTION – B
(Attempt any 5 questions)

19. Define static posture with one example?

20. Differentiate between Special Olympics and Paralympics?

21. Write about a test, that measures the flexibility of an individual?

22. What is muscle hypertrophy?

S

24. What do you understand by Motivation?

SECTION – C
(Attempt any 5 questions)

25. Briefly explain the different types of league tournaments?
26. Explain any three causes of menstrual dysfunction in female athletes?
27 Describe three ways physical activity benefits children with intellectual disabilities?
28. How does training affect the cardiorespiratory system in the long term?
29. Write the difference between static and dynamic friction. Give one example each?
30. Write three principles of physical training?

SECTION – D
(Internal choice available)

31. Yoga and meditation play a vital role in controlling high blood pressure (hypertension) by promoting mental relaxation and reducing stress. These practices not only help manage hypertension but also improve overall lifestyle and well-being. Combining Yoga and Naturopathy can be highly effective in the natural management of blood pressure.

Certain yoga poses (asanas) are especially beneficial for individuals with hypertension:
Katichakrasana helps in relieving stress and managing hypertension.
Bhujangasana supports in normalizing blood pressure by improving circulation and relaxing the body.
Dhanurasana is useful for reducing fatigue and increasing energy.
Shavasana is a deep relaxation pose that should be practiced when blood pressure is under control or during tiredness.

Among breathing techniques, *Chandrabhedi Pranayama* is particularly helpful in lowering blood pressure as it activates the body's cooling mechanism and soothes the nervous system.

Q1. How does yoga and meditation help in the management of high blood pressure (hypertension)?
Q2. Name any two yoga asanas mentioned in the passage that are useful in managing hypertension and explain their benefits briefly.
Q3. Why is *Shavasana* recommended only when blood pressure is under control?
Q4. Which pranayama technique is mentioned for lowering blood pressure, and how does it work?

32. Rahul is a national-level swimmer who practices for 3 hours daily. His coach advised him to increase his

intake of carbohydrates and proteins. Rahul also noticed that when he skips meals or doesn't hydrate properly, he feels tired and dizzy during training.

Q.1.Why did the coach recommend more carbohydrates and proteins?

Q.2.What could be the reason for Rahul to feel dizzy, when he skips meals or hydration?

33. Arjun slipped during a kabaddi match and twisted his ankle. His coach immediately applied the RICE method to treat the injury.

Q1. What type of injury has Arjun likely suffered?

Q2. What does "C" in RICE stand for?

Q3. A fracture is a soft tissue injury. (True or False)

Q4. _____ should be done to stop further movement. (Fill the blank)

(OR)

A basketball player lowers body while defending.

Q1. A _____ Centre of gravity increases stability. (Fill the blank)

Q2. Narrow base helps maintain balance. (True or False)

Q3. Match the following:

a) Wide base → i) High stability

b) Line of Gravity inside base → ii) Better balance

Q4. Why is controlling Centre of gravity important in invasion sports?

SECTION – E
(Attempt any 3 questions)

34. Write a detailed note on the importance and objectives of test and measurement in physical education and sports?

35. What is aging? Explain how aging affects physical fitness?

36. Explain the importance of sports psychology for coaches and athletes?

37. Describe the various methods to develop endurance and explain their benefits?

SAMPLE PAPER -6

SAMPLE PAPER -6							
BLUE PRINT							
		Weightag of Marks Alloted					
		SECTION-A	SECTION-B	SECTION-C	SECTION-D	SECTION-E	
		1 Mark	2 Marks	3 Marks	4 marks	5Marks	
Unit NO	UNIT Name	No of Questions	No of Questions	No of Questions	No of Questions	No of Questions	Total No of question
UNIT 1	Management of Sporting events	2	1	1		1	5
UNIT 2	Children and Women in Sports	2	0	1		1	4
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	1	1	0	1		3
UNIT 4	Physical Education & Sports for CWSN	2	1	1			4
UNIT 5	Sports & Nutrition	3	1	1	1		6
UNIT 6	Test & Measurment in Sports	2	0	0		1	3
UNIT 7	Physiology & Injuries in sports	2	1	1			4
UNIT 8	Biomechanics & Sports	2	0	0			2
UNIT 9	Psychology & Sports	1	0	0	1		2
UNIT 10	Training in Sports	1	0	0			1
No of questions		18	5	5	3	3	
Question Sno 1 to 34		1 to 18	19 to 24(CHOICE)	25 to 30 (CHOICE)	31 to 33	34 to 37 (CHOICE)	

SAMPLE PAPER - 06
PHYSICAL EDUCATION

Time allowed: 3hour ***Maximum Marks : 70***

General Instructions:

(i) *The question paper consists of 5 sections and 37 questions.*

(ii) *Section-A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.*

(iii) *Section-B consists of questions 19-24 carrying 2 marks each and are Very Short Answer Type and their answer should not exceed 60-90 words. Attempt any 5.*

(iv) *Section-C consists of questions 25-30 carrying 3 marks each and are Short Answer Type and their answer should not exceed 100-150 words. Attempt any 5.*

(v) *Section-D consists of questions 31-33 carrying 4 marks each and are case studies. There is an internal choice available.*

(vi) *Section-E consists of questions 34-37 carrying 5 marks each and are Long Answer types and their answer should not exceed 200-300 words. Attempt any 3.*

SECTION – A

(All Questions are compulsory)

1. Pre-Tournament works of organising secretary are.

A) Good planning B) Staff grouping and their cooperation

C) Raising funds D) All of the above

2. Umpires, Referees, Recorders, Time Keepers are part of…….

A) Organising committee B) Ground Arrangement committee .

C) Technical committee D) Reception committee

3. The transition period between childhood to adulthood is called

A) Senescence B) Adolescence

C) Early childhood D) Infanthood

4. Osteoporosis is related to:

A) High blood pressure B) Weak bones

C) Weight gain D) Heart issues

5. What is the Sanskrit word for "*Yoga*"?

A) Yuj B) Ananda

C) Atma D) Prana

6. Which of the following is not a disability?

A) Dyslexia B) Autism

C) Paralysis D) Asthma

7. The Paralympics is held after every:

A) 2 years B) 3 years

C) 4 years D) 1 year

8. What percentage of an athlete's diet should consist of carbohydrates?

A) 10–15% B) 20–30%

C) 40–45% D) 55–60%

9. Which nutrient helps in the absorption of fat-soluble vitamins?

A) Water B) Carbohydrates

C) Fats D) Proteins

10. What should athletes consume during long-duration sports events?

A) Fats B) Fiber

C) Energy drinks or glucose D) Cheese

11.Which of the following is a test for upper body strength?

A) Push-Up Test B) Sit and Reach Test

C) 600 Meter Run D) Shuttle Run

12.The test used to measure fitness of senior citizens is

A).Borrow motor fitness test B)HARVARD step test

C)Ringlike and Jones fitness test D)General motor fitness test

13.Identify the training method to improve flexibility?

A) Aerobic Tranining B) Anaerobic training

C) Warm-up exercises D) Strenghth Training

14.The role of myoglobin in muscles is to:

A) Transport fat B) Produce energy

C) Store oxygen D) Remove waste

15. Which of the following is an example of a first-class lever in the human body?

A) Bicep curl B) Standing on toes

C) Nodding the head D) Kicking a ball

16. When a sprinter clear starting blocks, which Newton's law is aplicable ?

A) First B) Second

C) Third D) Fourth

17.A person who enjoys interacting with others is most likely an:

A) Introvert B) Ambivert

C) Extrovert D) Narcissist

18.Which training method involves changing terrain, pace, and intensity?

A) Circuit training B) Fartlek training

C) Plyometric training D) Interval training

SECTION – B

(Attempt any 5 questions.)

19. Define cardiac output.

20. What are Special Olympics?

21. What do you understand by the Ardha Matsyendrasana?

22. Explain any two components of physical fitness.

23. What is meant by 'fixture' in sports events?

24. Name two food rich in calcium.

SECTION – C

(Attempt any 5 questions)

25. List the types of fractures and briefly explain any three.

26. What are three ways to prevent the Female Athlete Triad?

27. List any three components of a nutritive diet and give one example of each.

28. Write steps and benefits of Tadasana.

29. What adaptations can be made in sports to include children with visual impairments?

30. What are the components of personality? Briefly explain any three.

SECTION – D

(Attempt any 3 questions)

31. Geetha, the yoga teacher does regular yoga activities in her house with family. It helps to improve her family health. One day her neighbour, Sheela came to her house with her

daughter. Sheela's daughter is 14 but has short height. Geetha advised her to do some asanas regularly to increase her height.

1. Define Asana.

2. Which asana can be advised by Geeta?

(A) Tadasana (B) Bhujangasana
(C) Sukhasana (D)Both a & b

3. Vajrasana helps to relieve from

(A) Back pain (B) Constipation
(C) Headache (D) Both a & b

4. Which asana can be used to cure obesity?

(A) Pawanmuktasana (B) Matsyasana
(C) Shavasana (D) Trikonasana

32. **Case Based Question** :A school conducted a workshop on healthy eating habits. During the session, students were asked to track their daily food intake for a week. After analyzing their records, it was observed that many students were consuming sugary drinks and processed foods more frequently than recommended.

Based on the above passage, answer the following questions:

1. Fill in the Blank: The workshop focused on promoting _____ among students.

2. True or False: Students tracked their food intake for a month as part of the workshop.

3. One Word Answer: What type of drinks did many students consume excessively?

4. Very Short Answer (1–2 lines): What was the main objective of conducting this workshop in school?

33. **Case Based Question** : A sports coach observed that some players were losing interest during practice sessions. To improve their performance and boost morale, the coach introduced various techniques of motivation such as setting realistic goals, giving positive feedback, and conducting team-building activities. Over time, players began to show more dedication and achieved better results in competitions.

Based on the above passage, answer the following questions:

1. Fill in the Blank: The coach used _____ feedback to boost the morale of players.

2. True or False: Team-building activities were introduced to reduce competition among players.

3. One Word Answer: What type of goals were set to keep the players motivated?

4. Very Short Answer (1–2 lines): Name any two techniques of motivation used by the coach in the case study.

SECTION – E

(Attempt any 3 questions)

34. Being sports captain of the school, constitute five important committees with their responsibilities to conduct Run for Health Awareness.

35. What are the benefits of women's participation in sports?

36. Explain Asthma for *Parvatasana* and write steps and benefits of Asthma for *Parvatasana*

37. Explain SAI Khelo India Fitness test for age group 9-18 yrs age group.

- X - Y - X -

SAMPLE PAPER -7

SAMPLE PAPER 7							
BLUE PRINT							
		Weightag of Marks Alloted					
		SECTION-A	SECTION-B	SECTION-C	SECTION-D	SECTION-E	
		1 Mark	2 Marks	3 Marks	4 marks	5Marks	
Unit NO	UNIT Name	No of Questions	No of Questions	No of Questions	No of Questions	No of Questions	Total No of question
UNIT 1	Management of Sporting events	1	1	1			3
UNIT 2	Children and Women in Sports	1	1			1	3
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	1			1		2
UNIT 4	Physical Education & Sports for CWSN	2		1			3
UNIT 5	Sports & Nutrition	2			1		3
UNIT 6	Test & Measurment in Sports	2	1			1	4
UNIT 7	Physiology & Injuries in sports	2	1		1		4
UNIT 8	Biomechanics & Sports	3		1			4
UNIT 9	Psychology & Sports	2	1	1			4
UNIT 10	Training in Sports	2		1		1	4
Total Marks		18	5	5	3	3	34
No of questions		**18**	**5**	**5**	**3**	**3**	
Question Sno 1 to 34		1 to 18	19 to 24(CHOICE)	25 to 30 (CHOICE)	31 to 33	34 to 37 (CHOICE)	

SAMPLE PAPER -7
PHYSICAL EDUCATION

Time allowed: 3hour ***Maximum Marks : 70***

General Instructions:

(vii) *The question paper consists of 5 sections and 37 questions.*

(viii) *Section-A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.*

(ix) *Section-B consists of questions 19-24 carrying 2 marks each and are Very Short Answer Type and their answer should not exceed 60-90 words. Attempt any 5.*

(x) *Section-C consists of questions 25-30 carrying 3 marks each and are Short Answer Type and their answer should not exceed 100-150 words. Attempt any 5.*

(xi) *Section-D consists of questions 31-33 carrying 4 marks each and are case studies. There is an internal choice available.*

(xii) *Section-E consists of questions 34-37 carrying 5 marks each and are Long Answer types and their answer should not exceed 200-300 words. Attempt any 3.*

SECTION – A

(All Questions are compulsory)

1. _____ is cause of knock knees?

A) Lack of calcium B) Obesity

C) Long sitting D) None

2. Which type of lever is most common in the human body?

A) First B) Second

C) Third D) Fourth

3. Which organization is responsible for promoting sports among disabled persons?

A) ICC B) AIFF

C) PCI D) IOC

4. Which one of the following is an intellectual disability?

A) Autism B) Polio

C) Cerebral palsy D) Blindness

5.Given below are types of vitamins in List – I with their solubility nature and functions in List – II:

List – I (Vitamins) **List – II (Features)**

(A) Vitamin A i. Water-soluble- helps in energy metabolism

(B) Vitamin D I i. Fat-soluble- essential for bone health

(C) Vitamin B-complex iii. Water-soluble- includes B1, B2, B6, B12 etc.

(D) Vitamin C iv. Water-soluble- important for immunity

Match the items of List – I with List – II and choose the correct option from the following:

	(A)	(B)	(C)	(D)
A)	ii	i	iii	iv
B)	ii	ii	iii	i
C)	ii	ii	i	iii
D)	ii	ii	iii	iv

6. In knockout tournament teams has to
A)play one match B) play till they are winning
C) Gets bye D) Play large number of matches

7. Who is considered the father of Yoga?
A) Patanjali B) Buddha
C) Swami Vivekananda D) B.K.S. Iyengar

8. Which food is suitable for someone with gluten intolerance?
A) Wheat bread B) Pasta
C) Rice D) Barley

9. The purpose of the Standing Broad Jump test is to measure:
A) Agility B) Flexibility
C) Explosive leg power D) Reaction time

10. What should be the height of chair required in chair sit and reach test?
A) 40 cm B) 44 cm
C) 42 cm D) None of the above

11. Which system provides energy for a 1500m race?
A) ATP-CP B) Anaerobic
C) Aerobic D) None of these

12. Residual volume refers to:
A) Water in lungs B) Air left after exhalation
C) Maximum inhaled air D) Muscle energy

13.Which component is tested using the sit-and-reach test?
A) Speed B) Flexibility
C) Strength D) Endurance

14. Dynamic equilibrium occurs when:
A) The body is at rest B) The body is not moving
C) The body has no mass D) The body is moving with constant velocity

15. Which of the following is NOT a type of motivation?
A) Extrinsic B) Intrinsic
C) Positive D) Aggressive

16. Which personality type is more suitable for individual sports?
A) Extrovert B) Type A
C) Introvert D) Type B

17. The trajectory of a projectile is typically:
A) Straight line B) Vertical
C) Parabolic D) Zig-zag

18. Given below are two statements, one of which is labeled as Assertion (A) and other is labeled as Reason (R). Read both the statements carefully :

Assertion (A): An athlete must gradually increase the intensity and duration of training to improve performance effectively.
Reason (R): Sudden and intense workload helps in faster muscle recovery and increases strength immediately.

In the context of the above two statements, which one of the following is correct ?
A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
C) Assertion (A) is true, but Reason (R) is false.
D) Assertion (A) is false, but Reason (R) is true.

SECTION – B

(Attempt any 5 questions)

19. Explain sprain and Strain?

20. The two objectives of intramurals are:

21. What do understand by Psychological Attributes?

22. How does physical activity help in preventing lifestyle diseases?

23. What do you understand by the Ardha Matsyendrasana?

24. Give one application of anthropometric measurements in physical education.

SECTION – C

(Attempt any 5 questions.)

25. What are the components of personality? Briefly explain any three.

26. What are the challenges faced by teachers in implementing inclusive education for CWSN?

27. What is strength? Explain its types and any three methods to develop it.

28. Describe the factors affecting projectile motion in sports.

29. Write 3 (three) benefits of Dhanurasana.

30. What are the effects of physical inactivity on children's physical and mental health?

SECTION – D

(Attempt any 3 questions)

31. A 30-year-old individual suffering from chronic back pain is trying to manage their symptoms through yoga. The goal is to improve flexibility, build strength, and reduce pain. The yoga program includes specific asanas (postures), pranayama (breathing techniques), and relaxation practices.

Based on the above passage, answer the following questions:

i. Fill in the Blank: The individual chose yoga to manage chronic _____ pain.

ii. True or False: The yoga program focuses only on physical exercises to reduce back pain.

iii. Mention breathing practice is included in the yoga program?

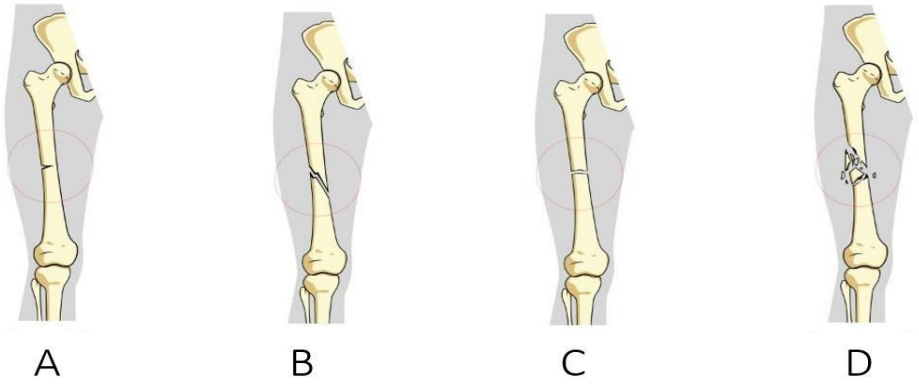
iv. Mention any one goal of using yoga to manage back pain.

32. Given below are types of fractures in List – I with their Picture in List – II :

List – I Types of Fractures

i. Transverse ii. Oblique iii. Green stick iv. Comminuted

List – II Picture



33. Jiya went to sports training center for the first time. Her coach informed her that participation in sports not only promotes physical growth but also has social and psychological benefits. He highlighted numerous physical benefits for muscles, heart and respiratory systems. He advised her to continue daily practice to improve her health related and skill related fitness.

Answer the following questions based on the above case and your prior knowledge :

i) Which is not a long-term effect of exercises on the muscular system ?

A) Hypertrophy of muscle
B) Increase in glycogen stored
C) Ligament and tendon strengthen
D) Accumulation of lactate

ii) What is cardiac output?

iii) Choose the correct statement related to tidal volume :

A) Amount of air inhaled and exhaled in one breath.
B) Amount of air inhaled in one breath
C) Amount of blood pumped out by heart in one stroke.
D) Amount of air exhaled in one breath

iv) Lactic acid tolerance relates to _____.

A) Strength B) Speed

C) Flexibility D) Endurance

SECTION – E

(Attempt any 3 questions)

34. What is aging? Explain how aging affects physical fitness.

35. What is Endurance? Explain its types and any three methods to develop it.

36. Explain Female Athlete Triad and its Prevention and Management.

37. What is the Rikli & Jones Senior Citizen Fitness Test? Explain its components and importance in assessing fitness levels of senior citizen.

- x - Y - x -

SAMPLE PAPER -8

SAMPLE PAPER-8							
BLUE PRINT							
		Weightag of Marks Alloted					
		SECTION -A	**SECTION -B**	**SECTION -C**	**SECTION -D**	**SECTION -E**	
		1 Mark	**2 Marks**	**3 Marks**	**4 marks**	**5Marks**	
Unit NO	**UNIT Name**	**No of Questions**	**No of Questions**	**No of Questions**	**No of Questions**	**No of Questions**	**Total No of question**
UNIT 1	Management of Sporting events	2	0	1	0	1	4
UNIT 2	Children and Women in Sports	1	1	1	0	1	4
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	2	0	1	0	0	3
UNIT 4	Physical Education & Sports for CWSN	2	0	1		0	3
UNIT 5	Sports & Nutrition	2	0	0	0	1	3
UNIT 6	Test & Measurment in Sports	2	1	0	1	0	4
UNIT 7	Physiology & Injuries in sports	1	1	0	1	0	3
UNIT 8	Biomechanics & Sports	2	1	1	1	0	5
UNIT 9	Psychology & Sports	2	1	1	0	0	4
UNIT 10	Training in Sports	2	1	0	0	1	4
No of questions		**18**	**5**	**5**	**3**	**3**	
Question Sno 1 to 34		**1 to 18**	**19 to 24 (CHOICE)**	**25 to 30 (CHOICE)**	**31 to 33**	**33 to 37 (CHOICE)**	

SAMPLE PAPER-08
PHYSICAL EDUCATION (048)
CLASS XII

Time allowed: 03 hours **Maximum Marks: 70**

General Instructions:

ee) The question paper consists of 5 sections and 37 questions

ff) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.

gg) Section B consists of questions 19-24 carrying 2 marks each and are very short answers type and their answers should not exceed 60-90 words. Attempt any 5.

hh) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.

ii) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an Internal choice available.

jj) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3**.**

SECTION – A
(All questions are compulsory)

1. Planning should be

(A) Specific (B) Logical (C) Flexible (D) All of the above

2. What is the first step in organizing a sports event?

A. Selection of teams B. Formation of committees
C. Budget preparation D. Fixing the venue

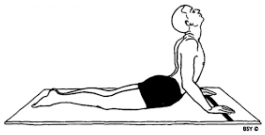
3. Which exercise helps correct flat foot?

A. Swimming B. Walking on toes C. Heel raise D. Sit-ups

4. What is the meaning of "Pranayama"?

(A) physical postures (B) meditation techniques
(C) breathing exercises (D) ethical practices

5.



is also known as

a. Dog posture b. Child posture
c. Cobra posture d. Reverse Boat posture

6. Which is not a component of inclusive education?

A) AcceptanceB) Discrimination C) Collaboration D) Adaptation

7. **What is the full form of PWD Act?**

A) Persons with Disorders Act B) People with Disabilities Act
C) Persons with Disabilities Act D) Public Welfare for Disabled Act

8. What is the primary role of iron in the body?

A) Boosts immunity B) Strengthens bones
C) Helps in oxygen transport D) Supports vision

9. Which nutrient helps in the absorption of fat-soluble vitamins?

A) Water B) Carbohydrates C) Fats D) Proteins

10. Assertion (A): The Eight-Foot Up and Go test is a reliable measure used to assess an individual's agility and dynamic balance.

Reason (R) 1: The test requires the participant to quickly stand from a seated position, walk around a cone, and return to the chair, which demands rapid changes in direction and controlled movement

A. A is true, R is false.
B. A is true, R is true but R is not the correct explanation of A.
C. A is true, R is true and R is the correct explanation of A.
D. A is false, R is true.

11. **Which of the following test is part of Johnson- Metheny Test battery for Motor educability.**

E. Front Roll B. Back Roll C. Jumping half-turn D. All of the above

12. What helps in maintaining internal balance during exercise?

A) Digestive system B) Endocrine and immune systems
C) Skeletal system D) Reproductive system

13. Which factor affects projectile motion the most?

A) Temperature B) Distance C) Air pressure D) Angle of release

14. Which of the following is NOT a type of friction?

A) Static B) Rolling C) Twisting D) Sliding

15. Which personality trait is associated with calm and relaxed behaviour?

A. Type A B. Type B C. Extrovert D. Neuroticism

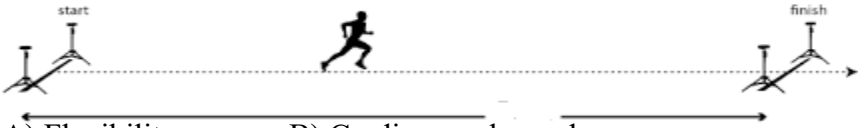
16. What is the primary goal of sports psychology?

A) To win at any cost
B) To improve mental and emotional well-being and performance in sports
C) To develop physical skills D) To assess athletic ability

17. **Which component of fitness is most emphasized in sprinting?**

A) Muscular endurance B) Flexibility C) Speed D) Coordination

18.Identfy given below picture of component of fitness is tested?



A) Flexibility B) Cardiovascular endurance
C) Speed D) Muscular strength

SECTION – B
(Attempt any 5 questions)

19. What is disordered eating? Give an example?
20. Which physical ability is evaluated by performing a 50-meter sprint?
21. Name two soft tissue injuries.
22. Differentiate between static and dynamic equilibrium?
23. What is aggression in sports, and how can it be managed?
24. What is explosive strength?

SECTION – C
(Attempt any 5 questions)

25. List any three objectives of sports event management?
26. Describe three corrective measures for postural deformities?
27. Define Dhanurasana and write 3 benefits of Dhanurasana?
28. State any three roles of the community in promoting inclusive sports?

29. Describe the factors affecting projectile motion in sports?

30. **Differentiate between cognitive and somatic anxiety?**

SECTION – D
(Internal choice available)

31. Case Study: Revitalizing Mrs. Singh's Fitness Journey

Mrs. Singh, a 45-year-old school teacher, has decided to prioritize her health and fitness. She feels generally sluggish, experiences occasional lower back stiffness, and gets breathless easily when climbing stairs. She wants to be more active, play with her grandchildren without getting tired, and improve her overall well-being. Before embarking on any specific exercise routine, her fitness trainer, Mr. Kumar, emphasizes the importance of a comprehensive fitness assessment.

Questions:

1. Explain the significance of Mr. Kumar conducting a baseline fitness assessment for Mrs. Singh.?

2. Based on Mrs. Singh's test results, identify her top three areas of improvement?

3. Suggest a brief, targeted training program (mentioning types of exercises) for Mrs. Singh for the first month?

4. Why is it crucial for Mr. Kumar to re-assess Mrs. Singh's fitness after a few months of following the targeted training program?

32. Case Study 2: Case Study: The Marathon Runner's Challenge

Riya, a 28-year-old amateur marathon runner, has been diligently training for her first full marathon. She has been consistently increasing her mileage over the past six months and feels confident about her cardiovascular endurance. However, she recently started experiencing some discomfort and an unexpected injury.

During a long training run (around 25 km), Riya felt a sharp pain in her left calf muscle, forcing her to stop. She noticed immediate tenderness and slight swelling. Upon consulting a sports physiotherapist, Dr. Meera, it was diagnosed as a Grade II calf muscle strain.

Dr. Meera also observed that Riya had slightly rounded shoulders and a forward head posture, which she hadn't noticed before. While discussing Riya's training, Dr. Meera asked about her warm-up and cool-down routines, and Riya admitted they were often rushed due to time constraints. Riya also mentioned that she had been pushing herself hard, often running on consecutive days with high intensity, as she was worried about not being "fit enough."

Questions:

1. Classify Riya's calf muscle injury. What type of injury is a "Grade II calf muscle strain,"?

2. Explain the immediate first aid protocol (R.I.C.E) that Riya should have applied immediately after her calf muscle strain?

3. Discuss two physiological changes that likely occurred in Riya's cardio-respiratory system and muscular system due to her consistent marathon training?

4. Considering her injury and postural issues, suggest two physiological factors that Riya should focus on improving to prevent future injuries and enhance her overall running performance?

33. Case Study: Analysing a Shot-Put Throw - Applying Newton's Laws

Rohan, a promising 17-year-old athlete, is preparing for the shot-put event in the upcoming school sports meet. He has good physical strength, but his coach, Mr. Sharma, feels that Rohan can significantly improve his throwing distance by understanding and applying the principles of biomechanics, specifically Newton's Laws of Motion. Mr. Sharma sets up a training session to analyze Rohan's technique.

Questions:

1. Which of Newton's Laws of Motion primarily explains why Rohan feels a backward push when he releases the shot put?

2. **How would a longer duration of force application (i.e., a better follow-through) impact the final velocity?**

3. **How does Newton's Second Law (F=mA) explain the relationship between the force Rohan applies, the mass of the shot put, and the acceleration it gains?**

4. **Explain the "action" and "reaction" forces involved, and how the reaction force affects Rohan's body.**

SECTION – E
(Attempt any 3 questions)

34. Discuss the various objectives of planning in sports and explain any two types of tournaments in detail.?

35. Explain any five common postural deformities in children, stating their causes and at least one general corrective measure for each. Why is early identification and intervention crucial for these deformities?

36. Critically analyse the 'Pitfalls of Dieting' for weight control, especially among young individuals and athletes. Discuss the potential negative consequences of unscientific or crash diets on physical health and psychological well-being, and suggest healthy approaches to weight management?

37. Discuss the importance of warm-up and cool-down routines in sports training. Explain the physiological benefits derived from each, and describe suitable activities for a general warm-up and cool-down session?

SAMPLE PAPER – 9

SAMPLE PAPER -9							
BLUE PRINT							
Unit NO	UNIT Name	Weightag of Marks Alloted					
		SECTION-A	**SECTION-B**	**SECTION-C**	**SECTION-D**	**SECTION-E**	
		1 Mark	**2 Marks**	**3 Marks**	**4 marks**	**5Marks**	
		No of Questions	**No of Questions**	**No of Questions**	**No of Questions**	**No of Questions**	**Total No of question**
UNIT 1	Management of Sporting events	2	1				3
UNIT 2	Children and Women in Sports	2	1	1			4
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UNIT 6	Test & Measurment in Sports	3	1			1	5
UNIT 7	Physiology & Injuries in sports	1	1	1			3
UNIT 8	Biomechanics & Sports	1		1	1		3
UNIT 9	Psychology & Sports	2	1			1	4
UNIT 10	Training in Sports	2		1		1	4
No of questions		**18**	**5**	**5**	**3**	**3**	
Question Sno 1 to 34		**1 to 18**	**19 to 24 (CHOICE)**	**25 to 30 (CHOICE)**	**31 to 33**	**33 to 37 (CHOICE)**	

SAMPLE PAPER-09
KENDRIYA VIDYALAYA SANGATHAN
PHYSICAL EDUCATION (Theory) (048)
CLASS XII

General Instructions:

kk) The question paper consists of 5 Sections and 37 questions

ll) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.

mm) Section B consists of questions 19-24 carrying 2 marks each and are very short answers type and their answers should not exceed 60-90 words. Attempt any 5.

nn) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.

oo) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an Internal choice available.

pp) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3.

SECTION – A

(All questions are compulsory)

1. Publishing rules and regulations for the tournament is …….... work.

   A) Pre B) During

   C) post D) any time

2. **What is the first step in organizing a sports event?**

   A) Selection of teams B) Formation of committees

   C) Budget preparation D) Fixing the venue

3. Which Indian woman won a gold medal in World Badminton Championship?

   A) Mary Kom B) Saina Nehwal

   C) P.V. Sindhu D). Sania Mirza

4. The Female Athlete Triad is a syndrome characterized by

   A) Osteoporosis B) Amenorrhea

   C) Eating Disorder D) All of the above

5. Name the asana in the picture given below.

   A) Tadasana B) Vajrasana

   C) Trikonasana D) Dhanurasana

6. Katichakrasana is a

   A). standing asana B). Sitting asana

   C). Lying asana D). Balancing asana

7. What is the meaning of the three 'Agitos' in the logo given below (Paralympic symbol)?

A) They represent athletes with different disabilities

B) They represent motion and unity in diversity

C) They stand for 3 Olympic values

D) They are decoration only

8. What is the full form of PWD Act?

A) Persons with Disorders Act B) People with Disabilities Act

C) Persons with Disabilities Act D) Public Welfare for Disabled Act

9. Which food is most suitable after a sports activity for muscle recovery?

A) Chocolate B) Banana

C) Chicken D) Soft drink

10. Which of the following is used to determine speed in Khelo India Fitness test?

A) 50 Meter Dash B) Sit-Up Test

C) Sit and Reach Test D) HARVARD Step Test

11. Identify the test items of the SAI Khelo India Fitness test for age group 5-8?

A) BMI B) Flamingo Balance Test

C) Plate tapping test D) All of the above

12. Eight foot up and go test is conducted to check the Coordination and agility in

A) Children B) Adolescent

C) Aged people D) Youth

13. In the RICE method, "C" stands for:

A) Cold B) Care

C) Compression D) Clean

14. What is the main purpose of using biomechanics in sports?

A) Only to prevent injury B) To build muscles

C) To optimize performance and prevent injury D) Only to understand muscles

15. Anxiety becomes a problem when:

A). It improves performance B) It motivates athletes
C) It affects focus and performance negatively D) It is experienced before a match

16. What does the term 'arousal' refer to in sports psychology?

A) Deep sleep B) Mental and physical activation
C) Exhaustion D) Aggression

17. Which of the following is a measure of cardiovascular endurance?

A) Push-up test B) Sit-and-reach test
C) Cooper 12-minute run D) Vertical jump test

18. Which type of strength is required to overcome resistance without body movement?

A) Dynamic strength B) Static strength
C) Explosive strength D) Maximum strength

SECTION – B
(Attempt any 5 questions)

19. Explain the staircase method of a League Tournament.
20. Name two psychological benefits of participation in sports.
21. What is meant by 'evaluation' in the field of physical education?
22. What are fast-twitch fibres used for?
23. Discuss the importance of goal setting in sports.
24. What do you understand by Asthma?

SECTION – C
(Attempt any 5 questions)

25. Explain the term ‘low energy availability’ and how it impacts athletic performance
26. Explain any three provisions under the Persons with Disabilities Act (PWD Act) related to education or sports.
27. Explain the concept of cardiorespiratory endurance.
28. Compare kinematics and kinetics with definitions and examples.
29. Define flexibility and explain two methods to improve it.
30. Explain the concepts of dynamic and static equilibrium and their importance in sports.

SECTION – D
(Internal choice available)

31. Yoga helps in managing obesity, and regulates metabolism, appetite regulation, and stress reduction.

A) Yoga can help build lean muscle mass True / false

B) which asanas helps to prevent obesity

C) which asanas will help in reducing stress

D) which asana can be performed after taking food, helps for digestion

32. A30-year-old marathon runner is experiencing fatigue and muscle cramps during long runs. Coach analyse the potential nutritional causes of these symptoms and recommend a plan to address the issue.

A) Suggest training method for Marathon runner

B) What is the treatment for muscle cramps

C) Suggest diet plan for Marathon runner

D) Do you suggest any chemical substance to improve performance

33. A 17-year-old soccer player named Alex notices during games that opponents often beat them with quick direction changes. Alex approaches their coach, seeking ways to improve agility and directional speed. The coach wants to assess and train Alex properly to help develop these skills.

A) What physical fitness components should the coach assess in Alex to determine the root cause of slow direction changes?

B) What are the common injuries associated with rapid direction changes, and how can a training program be designed to minimize these risks for Alex?

C) f Alex lacks core strength and balance, what specific exercises should be included in their training plan to target these areas?

D) what type of meal the coach would suggest

OR

A sprinter wants to improve their acceleration off the blocks. Newton's Laws of Motion can be applied to improve their technique.

A) which Newton laws of motion is applicable

B) explain acceleration

C) suggest methods to improve acceleration

D) do you suggest weight training for improvement of acceleration

SECTION – E
(Attempt any 3 questions)

34. A school is implementing the SAI Khelo India Fitness Test to assess the fitness levels of its students. Design a plan for administering the test, including procedures and protocol for conducting tests

35. An athlete wants to improve their performance and overall well-being. Explain the role of self-esteem, mental imagery, self-talk, and goal setting in enhancing athletic performance and suggest strategies for developing these attributes.

36. What is strength? Explain its types and any three methods to develop it.

37. A sprinter wants to improve their acceleration off the blocks. Explain how Newton's Laws of Motion can be applied to improve their technique.

SAMPLE PAPER-10

SAMPLE PAPER - 10							
BLUE PRINT							
Unit NO	**UNIT Name**	**Weightage of Marks Alloted**					
		SECTION -A	**SECTION-B**	**SECTION-C**	**SECTION -D**	**SECTION-E**	
		1 Mark	**2 Marks**	**3 Marks**	**4 marks**	**5Marks**	
		No of Questions	**No of Questions**	**No of Questions**	**No of Questions**	**No of Questions**	**Total No of question**
UNIT 1	**Management of Sporting events**	**3**		**1**			4
UNIT 2	**Children and Women in Sports**	**3**			**1**		4
UNIT 3	**Yoga as Preventive measure for Lifestyle Disease**	**3**			**1**		4
UNIT 4	**Physical Education & Sports for CWSN**	**1**		**1**			2
UNIT 5	**Sports & Nutrition**	**2**	**1**	**1**			4
UNIT 6	**Test & Measurment in Sports**	**1**	**1**			**1**	3
UNIT 7	**Physiology & Injuries in sports**	**1**	**2**				3
UNIT 8	**Biomechanics & Sports**	**1**			**1**	**1**	3
UNIT 9	**Psychology & Sports**	**2**	**1**	**1**			4
UNIT 10	**Training in Sports**	**1**		**1**		**1**	3
No of questions		18	5	5	3	3	
Question Sno 1 to 34		**1 to 18**	**19 to 24 (CHOICE)**	**25 to 30 (CHOICE)**	**31 to 33**	**33 to 37 (CHOICE)**	

SAMPLE PAPER-10
PHYSICAL EDUCATION (048)
CLASS XII

Time allowed: 03 hours **Maximum Marks: 70**

General Instructions:

qq) The question paper consists of 5 sections and 37 questions

rr) Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.

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tt) Section C consists of questions 25-30 carrying 3 marks each and are short answers type and their answers should not exceed 100-150 words. Attempt any 5.

uu) Section D consists of questions 31-33 carrying 4 marks each and are case studies. There is an internal choice available.

vv) Section E consists of questions 34-37 carrying 5 marks each and are Long answers type and their answers should not exceed 200-300 words. Attempt any 3**.**

SECTION – A
(All questions are compulsory)

1) Schedule of the tournaments is also named as……

A. Fixture B. Format C. Protocol D. Agenda

2) In a league tournament with 6 teams, how many total matches will be played (single league)?

A. 15 B. 6 C. 30 D. 12

3) Assertion (A): Planning is essential in sports as it helps in achieving goals efficiently.

Reason (R): Planning reduces the chances of injuries and improves time management during training and competition.

Choose the correct option:

A. Both A and R are true, and R is the correct explanation of A.

B. Both A and R are true, but R is not the correct explanation of A.

C. A is true, but R is false.

D. A is false, but R is true.

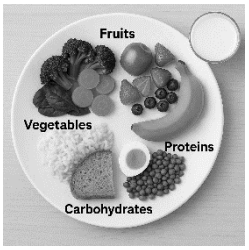
4) One major barrier to women's participation in sports is:

A. Tall height B. Low RBC count C. High stamina D. Good nutrition

5) P V Sindu was the first Indian to win world championship

A. 2013 Bronze B. 2016 Silver C. 2014 Bronze D. 2019 Gold

6) What does the image most appropriately represent in the context of sports nutrition?



A. High-protein diet for bodybuilders

B. A balanced diet necessary for athletes

C. Low-calorie diet for weight loss

D. A carbohydrate-rich meal before competition

7) Which asana is recommended to prevent diabetes?

A. Tadasana B. Shavasana

C. Vajrasana D. Trikonasana

8) Assertion (A): Yoga is effective in managing diabetes.

Reason (R): Yoga helps in increasing blood sugar levels to provide energy during practice.

Options:

A. Both A and R are true, and R is the correct explanation of A.

B. Both A and R are true, but R is not the correct explanation of A.

C. A is true, but R is false.

D. A is false, but R is true.

9) Katichakrasana is a

A. standing asana B. Sitting asana C. Lying asana D. Balancing asana

10) Which of the following aims at empowering persons with disabilities?

A. Khelo India B. PWD Act C. UDAAN Scheme D. RTI Act

11) What is the main cause of lactose intolerance?

A. Allergy to milk protein B. Lack of lactase enzyme

C. Excessive calcium D. Overeating dairy products

12) Which of the following is a good source of protein for vegetarians?

A. Chicken B. Eggs C. Lentils D. Fish

13) Which component of fitness is tested by the "Arm Curl Test"?

A. Muscular Strength B. Flexibility C.Agility D. Endurance

14) Which of the following muscle fibers is best suited for endurance activities like marathon running?

A. Cardiac Muscle B. Type II b C. Type I D. Type IIa

15) Which type of friction helps a footballer change direction quickly?

A. Static friction B. Fluid friction C. Rolling friction D. Kinetic friction

16) Which is a psychological benefit of sports?

A. Increased cholesterol B. Reduced endurance C. Reduced stress D. Physical fatigue

17) What is the term for the process of visualizing successful outcomes or performance in sports?

A. Self-talk B. Mental imagery C. Goal setting D. Positive reinforcement

18) **The ability to change direction quickly is known as**

A. Power B. Speed C. Agility D. Balance

SECTION – B
(Attempt any 5 questions)

19) Mention three healthy eating habits that promote long-term health.

20) Can you name a test that is used to check a person's agility?

21) Mention one benefit of the RICE method.

22) Explain one example where low COG benefits performance.

23) What is self-esteem, and how does it affect sports performance?

24) Discuss the types of aggression in sports and how they can be managed.

SECTION – C
(Attempt any 5 questions)

25) Mention three committees formed for organizing a sports event.

26) Suggest five strategies a physical education teacher can adopt to ensure inclusive participation in PE classes.

27) What are the components of personality? Briefly explain any three

28) Define flexibility and explain two methods to improve it.

29) Write a short note on any three types of strength.

30) Mention three healthy eating habits that promote long-term health.

SECTION – D
(Internal choice available)

31) **Case:** Anjali, a 17-year-old athlete, has been participating in long-distance running events at the state level. She trains intensely every day and is very conscious about her weight. Recently, she has started feeling dizzy during training and complains of frequent headaches. Her friends also noticed that she looks unusually pale and often feels too tired to concentrate in class. On visiting a doctor, she is diagnosed with iron-deficiency anaemia.

1. What could be the most likely cause of Anjali's iron-deficiency anaemia?

2. Which symptom is commonly associated with anaemia in female athletes?

3. What is the best dietary advice for Anjali to manage her condition?

4. Which of the following terms refers to the health issues arising from low energy availability in female athletes?

32) **Case:** Ramesh, a 45-year-old school teacher, had been struggling with high blood pressure and stress due to his hectic work schedule and sedentary lifestyle. On his doctor's advice, he joined a morning yoga class in his neighborhood. Within a few months, he noticed improvements in his physical and mental health. His blood pressure stabilized, his sleep quality improved, and he felt more energetic and calmer throughout the day.

1. Which of the following asanas is most suitable for managing high blood pressure?

2. Which pranayama is known to help reduce stress and calm the nervous system?

3. What is one of the major benefits of practicing yoga regularly for middle-aged individuals like Ramesh?

4. Which yoga practice is best known for promoting relaxation and better sleep?

33) **Case**: Projectile Motion in Javelin Throw

A javelin thrower releases the javelin at an angle of 45°. The performance of the throw depends on various factors such as angle, speed, height, and external forces.

A) Fill in the blank:

The ideal or optimal angle of release for achieving maximum horizontal distance in projectile motion (without air resistance) is _____ degrees.

B) True or False:

The speed at which the javelin is released has no effect on the range of the throw.

C) Match the following:

Column A	Column B
1. Speed of release	A) Pulls the object downward
2. Gravity	B) Affects the throwing distance
3. Air resistance	C) Opposes the motion through air

D) Short Answer:

Why might a taller javelin thrower have a natural advantage when it comes to achieving a longer throw?

SECTION – E
(Internal choice available)

34) Write a detailed note on the importance and objectives of test and measurement in physical education and sports.

35) How do friction and projectile motion affect performance in various sports? Explain with examples.

36) Explain the different methods used to develop endurance and discuss the benefits of each method

37) Explain SAI Khelo India Fitness test for age group 9-18 yrs age group.

COMPETENCY-BASED/CASE BASED QUESTIONS

CHAPTER 1: MANAGEMENT OF SPORTING EVENTS

COMPETENCY-BASED QUESTIONS

- Design a comprehensive plan for managing a school-level sports tournament, including details on staffing, logistics, and emergency procedures.
- Create a schedule for a 10-team knockout basketball tournament, including fixtures, timings, and venue details.
- Describe the roles and responsibilities of the Organizing Committee, Logistics Committee and Marketing Committee in managing a sports event.
- Explain the importance of having a Safety and Security Committee during a sports event, highlighting their key responsibilities.
- Calculate the number of matches in a knockout tournament with 16 teams, including the number of byes and the seeding procedure.
- Design a league tournament schedule for 6 teams using the staircase method, including fixtures and timings.
- Compare and contrast intramural and extramural tournaments, highlighting their objectives, significance, and benefits for participants.
- Explain the role of intramural tournaments in promoting physical activity and teamwork among school students.
- Design a community sports program for promoting physical activity and social inclusion, including details on event planning, marketing, and execution.
- Explain the significance of community sports programs like Sports Day, Health Run, and Run for Unity in promoting social cohesion and physical activity.

CASE-BASED QUESTIONS

1. Suppose you are the event manager for a school sports tournament. Describe how you would handle a sudden downpour during the event, ensuring the safety of participants and spectators.

2. A school is planning to organize a Health Run to promote physical activity and health awareness. Describe the steps you would take to plan and execute the event successfully.

2.CHILDREN & WOMEN IN SPORTS

COMPETENCY-BASED QUESTIONS

1. What are the World Health Organization's exercise guidelines for different age groups, and how can they be applied to improve overall health and fitness?
2. Design an exercise program for a 16-year-old athlete, incorporating the principles of periodization and progressive overload.
3. Knock Knees (Genu Valgum): What are the causes and symptoms of knock knees, and what corrective measures can be taken to alleviate the condition?
4. Flat Foot (Pes Planus): How does flat foot affect athletic performance, and what exercises can be done to strengthen the foot muscles?

5. Round Shoulders: What are the causes of round shoulders, and what corrective measures can be taken to improve posture?
6. Lordosis, Kyphosis, and Scoliosis: What are the differences between these three spinal deformities, and what treatment options are available for each?
7. Bow Legs (Genu Varum): What are the causes and symptoms of bow legs, and what corrective measures can be taken to alleviate the condition?
8. What are the physical benefits of participation in sports for women, and how can regular exercise improve overall health and well-being?
9. How does participation in sports affect the mental health and self-esteem of women?What are the strategies that can be used to promote positive body image?
10. What are the social benefits of participation in sports for women, and how can sports be used as a tool for empowerment and social change?
11. Menarche and Menstrual Dysfunction: What are the effects of intense exercise on menstrual cycles, and how can athletes manage menstrual-related issues?
12. How can coaches and trainers support female athletes with menstrual dysfunction, and what resources are available for athletes experiencing menstruation-related issues?
13. What are the three components of the Female Athlete Triad, and how do they interrelate to affect athletic performance and overall health?
14. How can coaches and trainers identify and support athletes at risk for the Female Athlete Triad, and what are the strategies that can be used for prevention and treatment ?
15. Case Study: A 17-year-old long-distance runner suffers from amenorrhea and stress fractures. What steps would you take to diagnose and treat the Female Athlete Triad in this athlete?

CASE-BASED QUESTIONS

1. A 15-year-old gymnast suffers from knee pain and is diagnosed with knock knees. Design a corrective exercise program to alleviate the condition and prevent future injuries.
2. A 16-year-old soccer player experiences irregular periods and is concerned about the impact on her athletic performance. What advice would you give her regarding menstrual management and athletic performance?
3. A 17-year-old runner is diagnosed with the Female Athlete Triad and is struggling with eating disorders. What strategies would you use to support her recovery and promote a healthy balance with food and exercise?

3. YOGA AS PREVENTIVE MEASURE FOR LIFESTYLE DISEASE

COMPETENCY-BASED QUESTIONS

Obesity

1. Design a yoga program to help reduce obesity, including asanas, pranayama, and relaxation techniques.
2. Explain the benefits of yoga in managing obesity, including its impact on metabolism, appetite regularization and stress reduction.

Diabetes

1. Discuss the role of yoga in managing diabetes, including its effects on blood sugar levels, insulin sensitivity, and stress reduction.

2. Create a yoga routine for a person with diabetes, incorporating asanas, pranayama, and relaxation techniques to improve insulin sensitivity and overall well-being.

Asthma
1. Explain the benefits of yoga in managing asthma, including its effects on lung function, breathing patterns, and stress reduction.
2. Design a yoga program for a person with asthma, including asanas, pranayama, and relaxation techniques to improve lung function and reduce symptoms.

Hypertension
1. Discuss the role of yoga in managing hypertension, including its effects on blood pressure, stress reduction, and cardiovascular health.
2. Create a yoga routine for a person with hypertension, incorporating asanas, pranayama, and relaxation techniques to reduce blood pressure and improve cardiovascular health.

Back Pain and Arthritis
1. Explain the benefits of yoga in managing back pain and arthritis, including its effects on flexibility, strength, and pain reduction.
2. Design a yoga program for a person with back pain or arthritis, including asanas, pranayama, and relaxation techniques to improve flexibility and strength, and to reduce pain.

CASE-BASED QUESTIONS

Case 1: Obesity
A 35-year-old individual with a BMI of 30 is seeking to lose weight through yoga. Design a 4-week yoga program for this individual, including asanas, pranayama, and relaxation techniques to improve metabolism, reduce appetite, and enhance overall well-being.

Case 2: Diabetes
A 40-year-old individual with type 2 diabetes is looking to incorporate yoga into their health-management plan. Create a yoga routine that includes asanas, pranayama, and relaxation techniques to improve insulin sensitivity, reduce stress, and enhance overall well-being.

Case 3: Asthma
A 25-year-old individual with asthma is seeking to manage their symptoms through yoga. Design a yoga program that includes asanas, pranayama, and relaxation techniques to improve lung function, reduce stress, and enhance overall well-being.

Case 4: Hypertension
A 50-year-old individual with hypertension is looking to incorporate yoga into their health management plan. Create a yoga routine that includes asanas, pranayama, and relaxation techniques to reduce blood pressure, improve cardiovascular health, and enhance overall well-being.

4. PHYSICAL EDUCATION & SPORTS FOR CWSN

COMPETENCY-BASED QUESTIONS

Organizations Promoting Disability Sports
1. Compare and contrast the roles of Special Olympics, Paralympics, and Deaflympics in promoting disability sports.
2. Explain the significance of these organizations in providing opportunities for athletes with disabilities to participate in sports.

Classification and Divisioning in Sports

1. Discuss the concept of classification and divisioning in disability sports, including its importance and benefits.
2. Explain how classification and divisioning systems ensure fair competition among athletes with different types and levels of disability.

Inclusion in Sports
1. Discuss the concept of inclusion in sports, including its need and benefits for athletes with disabilities.
2. Explain strategies for implementing inclusion in sports, including adapted physical education programs and inclusive sports facilities.

Advantages of Physical Activities for CWSN
1. Discuss the physical, emotional, and social benefits of physical activity for children with special needs.
2. Explain how physical activity can enhance the overall development and well-being of children with special needs.

Strategies for Accessible Physical Activities
1. Discuss strategies for making physical activities accessible for children with special needs, including adapted equipment and inclusive teaching methods.
2. Explain the importance of individualized support and accommodations in ensuring that children with special needs can participate fully in physical activities.

Case-Based Questions
Case 1: Inclusive Sports Program
A school is planning to launch an inclusive sports program for students with and without disabilities. Design a plan for implementing this program, including strategies for promoting inclusion, adapting physical activities, and providing support for students with special needs.

Case 2: Classification and Divisioning
An athlete with a physical disability is seeking to participate in a track and field event at the Paralympic Games. Explain the classification and divisioning process that the athlete would undergo to ensure fair competition.

Case 3: Accessible Physical Education
A physical education teacher is working with a class that includes students with a range of abilities and disabilities. Design a lesson plan that incorporates adapted physical activities and inclusive teaching methods to ensure that all students can participate fully.

Case 4: Benefits of Physical Activity
A child with an intellectual disability is participating in a sports program for children with special needs. Discuss the potential benefits of physical activity for this child, including improved physical fitness, social skills, and self-esteem.

5 SPORTS & NUTRITION

COMPETENCY-BASED QUESTIONS

Balanced Diet and Nutrition
1. Explain the concept of a balanced diet and its importance for athletes.
2. Discuss the role of nutrition in enhancing athletic performance and overall health.

Macro and Micro Nutrients
1. Compare and contrast the functions and food sources of carbohydrates, proteins, and fats.
2. Discuss the importance of vitamins and minerals in maintaining optimal health and athletic performance.

Nutritive and Non-Nutritive Components of Diet
1. Explain the difference between nutritive and non-nutritive components of diet, including their effects on health and athletic performance.
2. Discuss the benefits and risks of dietary supplements, including their use in sports.

Eating for Weight Control
1. Discuss the importance of maintaining a healthy weight for athletes, including the risks of underweight and overweight.
2. Explain the pitfalls of dieting, including the potential negative effects on athletic performance and overall health.

CASE-BASED QUESTIONS

Case 1: Athlete's Diet Plan
A 19-year-old soccer player is seeking to optimize their diet for improved performance. Design a balanced diet plan that includes the recommended daily intake of macro and micro nutrients.

Case 2: Weight Management
A 25-year-old wrestler is trying to lose weight to compete in a lower weight class. Discuss the potential risks of rapid weight loss and recommend a safe and effective weight management plan.

Case 3: Sports Nutrition
A 30-year-old marathon runner is experiencing fatigue and muscle cramps during long runs. Analyze the potential nutritional causes of these symptoms and recommend a plan to address them.

Case 4: Dietary Supplements
A 20-year-old athlete is considering taking dietary supplements to improve their performance. Discuss the potential benefits and risks of supplements, including the importance of consulting with a healthcare professional.

Case 5: Healthy Eating Habits
A school is promoting healthy eating habits among its students. Design a nutrition education program that includes information on balanced diets, healthy weight management, and the importance of nutrition for athletic performance.

6 .TEST AND MEASUREMENT IN SPORTS

COMPETENCY-BASED QUESTIONS

Fitness Test
1. Explain the purpose and procedures of the SAI Khelo India Fitness Test in schools.
2. Discuss the importance of fitness testing in identifying areas for improvement and developing targeted training programs.

Measurement of Cardio-Vascular Fitness
1. Describe the HARVARD Step Test and its significance in measuring cardio-vascular fitness.
2. Explain how to calculate the cardio-vascular fitness index using the HARVARD Step Test.

Computing Basal Metabolic Rate (BMR)
1. Explain the concept of Basal Metabolic Rate (BMR) and its significance in determining energy needs.
2. Describe how to calculate BMR using the Harris-Benedict equation.

Senior Citizen Fitness Test
1. Explain the purpose and procedures of the Rikli & Jones Senior Citizen Fitness Test.
2. Discuss the importance of assessing fitness in older adults and the benefits of regular physical activity.

Motor Educability Test
1. Describe the Johnsen-Metheny Test of Motor Educability and its significance in assessing motor skills.
2. Explain how to interpret the results of the test and develop targeted training programs.

CASE-BASED QUESTIONS

Case 1: Fitness Testing
A school is implementing the SAI Khelo India Fitness Test to assess the fitness levels of its students. Design a plan for administering the test, including procedures for data collection and analysis.

Case 2: Cardio-Vascular Fitness
A 25-year-old athlete wants to improve their cardio-vascular fitness. Design a training program using the HARVARD Step Test to assess their progress.

Case 3: BMR Calculation
A 30-year-old individual wants to determine their daily energy needs. Calculate their BMR using the Harris-Benedict equation and explain the significance of the result.

Case 4: Senior Citizen Fitness
A 65-year-old individual wants to improve their fitness levels. Design a fitness program using the Rikli & Jones Senior Citizen Fitness Test to assess their progress.

Case 5: Motor Educability
A physical education teacher wants to assess the motor skills of their students. Explain how to administer the Johnsen-Metheny Test of Motor Educability and interpret the results.

7. PHYSIOLOGY AND INJURIES IN SPORTS

COMPETENCY-BASED QUESTIONS

Physiological Factors Determining Components of Physical Fitness
1. Explain how physiological factors such as cardiovascular endurance, muscular strength and endurance, and flexibility determine components of physical fitness.
2. Discuss the role of physiological factors in enhancing athletic performance and overall health.

Effect of Exercise on the Muscular System
1. Describe the effects of exercise on the muscular system, including increased strength, endurance, and hypertrophy.
2. Explain how different types of exercise (e.g., aerobic, anaerobiC) affect muscle function and structure.

Effect of Exercise on the Cardio-Respiratory System
1. Describe the effects of exercise on the cardio-respiratory system, including increased cardiac output, ventilation, and oxygen delivery.
2. Explain how regular exercise can lead to adaptations in the cardio-respiratory system, improving overall fitness and health.

Physiological Changes due to Aging
1. Describe the physiological changes that occur with aging, including decreased muscle mass, strength, and flexibility, and reduced cardiovascular function.
2. Discuss the implications of these changes for physical activity and exercise programming for older adults.

Sports Injuries: Classification
1. Classify sports injuries into different types, including acute and chronic injuries, and explain their causes and characteristics.
2. Discuss the importance of proper injury management and prevention strategies in sports.

CASE-BASED QUESTIONS

Case 1: Exercise Program Design
A fitness trainer wants to design an exercise program for a client with specific fitness goals. Explain the physiological factors that determine components of physical fitness and design a program that addresses these factors.

Case 2: Injury Prevention
A sports team wants to prevent injuries and improve performance. Design a plan to prevent injuries, including strategies for warm-up, cool-down, and injury management.

Case 3: Physiological Adaptations to Exercise
An athlete wants to improve their endurance performance. Explain the physiological adaptations that occur with regular exercise, including changes in the muscular and cardio-respiratory systems.

Case 4: Aging and Exercise
An older adult wants to start an exercise program to improve their health and fitness. Explain the physiological changes that occur with aging and design an exercise program that takes into account these changes.

8. BIOMECHANICS AND SPORTS

COMPETENCY-BASED QUESTIONS

Newton's Law of Motion
1. Explain Newton's Laws of Motion and their application in sports, including examples of inertia, momentum, and force.
2. Discuss how understanding Newton's Laws can improve athletic performance and technique.

Types of Levers
1. Describe the three types of levers (first-class, second-class, and third-class) and their applications in sports.
2. Explain how levers can be used to gain mechanical advantage in sports, including examples of lever systems in the human body.

Equilibrium and Centre of Gravity
1. Explain the concepts of dynamic and static equilibrium and their importance in sports.
2. Discuss the role of centre of gravity in maintaining balance and stability in sports, including examples of how athletes can adjust their centre of gravity to improve performance.

Friction and Sports
1. Explain the concept of friction and its importance in sports, including examples of static and kinetic friction.
2. Discuss how athletes can use friction to their advantage in different sports, including strategies for increasing or decreasing friction.

Projectile Motion
1. Explain the concept of projectile motion and its application in sports, including examples of throwing, jumping, and kicking.
2. Discuss the factors that affect the trajectory of a projectile, including angle of release, velocity, and air resistance.

CASE-BASED QUESTIONS

Case 1: Sprinting
A sprinter wants to improve their acceleration off the blocks. Explain how Newton's Laws of Motion can be applied to improve their technique.

Case 2: Golf Swing
A golfer wants to increase the distance of their drive. Explain how the principles of levers can be applied to improve their swing.

Case 3: Balance and Stability
A gymnast wants to improve their balance on the balance beam. Explain the importance of centre of gravity and equilibrium in maintaining balance.

Case 4: Friction in Sports
A soccer player wants to improve their ability to change direction quickly on the field. Explain the role of friction in this context and suggest strategies for improving traction.

Case 5: Projectile Motion

A basketball player wants to improve their shooting accuracy. Explain the factors that affect the trajectory of the ball and suggest strategies for improving accuracy.

9. PSYCHOLOGY & SPORTS

COMPETENCY-BASED QUESTIONS

Personality

1. Explain the concept of personality and its significance in sports, including the Jung Classification and Big Five Theory.
2. Discuss how personality traits can influence athletic performance and behavior.

Motivation

1. Define motivation and explain its types (intrinsic and extrinsiC), including techniques for enhancing motivation in sports.
2. Discuss the role of motivation in athletic performance and how coaches can promote motivation in athletes.

Exercise Adherence

1. Explain the reasons for exercise adherence and its benefits, including strategies for enhancing exercise adherence.
2. Discuss the importance of exercise adherence in maintaining physical activity and overall health.

Aggression in Sports

1. Define aggression and explain its types (hostile and instrumental) in the context of sports.
2. Discuss the factors that contribute to aggression in sports and strategies for managing aggression.

Psychological Attributes

1. Explain the concept of self-esteem and its significance in sports, including strategies for enhancing self-esteem.
2. Discuss the role of mental imagery, self-talk, and goal setting in enhancing athletic performance and overall well-being.

CASE-BASED QUESTIONS

Case 1: Personality and Performance

A coach wants to understand the personality traits of their athletes to improve team dynamics and performance. Explain how the Big Five Theory can be applied to assess personality traits.

Case 2: Motivation Techniques

An athlete is struggling with motivation and wants to improve their performance. Suggest techniques for enhancing intrinsic and extrinsic motivation.

Case 3: Exercise Adherence

A fitness program is experiencing high dropout rates. Design a plan to enhance exercise adherence, including strategies for promoting motivation and engagement.

Case 4: Aggression in Sports

A football player is struggling with aggression on the field and wants to manage their behavior. Discuss the factors that contribute to aggression and suggest strategies for managing aggression.

Case 5: Psychological Attributes

An athlete wants to improve their performance and overall well-being. Explain the role of self-esteem, mental imagery, self-talk, and goal setting in enhancing athletic performance and suggest strategies for developing these attributes.

10. TRAINING IN SPORTS

COMPETENCY-BASED QUESTIONS

Talent Identification and Development

1. Explain the concept of talent identification and talent development in sports, including the importance of early identification and development.

2. Discuss the factors that contribute to talent identification and development, including genetic and environmental factors.

Sports Training Cycle
1. Describe the different types of training cycles (micro, meso, macro) and their significance in sports training.
2. Explain how to design a training program using the macro cycle, including goal setting and periodization.

Strength, Endurance, and Speed
1. Discuss the types and methods of developing strength, endurance, and speed, including weight training, plyometrics, and interval training.
2. Explain how to design a training program to develop strength, endurance, and speed for a specific sport.

Flexibility and Coordinative Ability
1. Discuss the types and methods of developing flexibility and coordinative ability, including stretching exercises and agility drills.
2. Explain the importance of flexibility and coordinative ability in sports and how to incorporate them into a training program.

Circuit Training
1. Explain the concept of circuit training and its importance in sports training, including its benefits and applications.
2. Design a circuit training program for a specific sport, including exercises and drills to improve fitness and athleticism.

CASE-BASED QUESTIONS

Case 1: Talent Identification
A coach wants to identify talented young athletes for a sports program. Design a talent identification program, including the factors to consider and the methods to use.
Case 2: Training Cycle
An athlete is preparing for a major competition and wants to design a training program using the macro cycle. Explain how to periodize the training program to achieve peak performance.
Case 3: Strength and Endurance
A long-distance runner wants to improve their strength and endurance. Design a training program, including exercises and drills to improve muscular strength and cardiovascular endurance.
Case 4: Flexibility and Agility
A gymnast wants to improve their flexibility and coordinative ability. Design a training program, including stretching exercises and agility drills to improve flexibility and coordinative ability.
Case 5: Circuit Training
A fitness trainer wants to design a circuit training program for a group of athletes. Explain the benefits of circuit training and design a program that includes exercises and drills to improve fitness and athleticism.

CBSE BOARD QUESTION PAPER 2024-25

Section-A
(All Questions are compulsory.)

1. **Which one of the following is a post-competition responsibility of the technical committee?**

   (A) Requisition to purchase equipment (B) Arrangement of equipment and stationery

   (C) Arrangement of officials **(D) Maintenance of the field**

2. **Which of the following is an objective of Intramural tournaments?**

   (A) To achieve high performance at the highest level of the tournament.

   (B) To develop the feeling of integration with other institutions.

   (C) To provide opportunities for choosing a career in sports.

   (D) To promote health and recreation at the institution.

3. **Which of the following deformity is NOT related to lower extremities?**

   (A) Knock-Knee **(B) Scoliosis** (C) Bow-legs (D) Flat-foot

4. **Brisk walking, running, bicycling and jumping are related to which activities?**

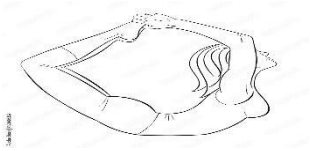
   (A) Speed activities (B) Strength activities

   (C) Endurance activities (D) Co-ordinative activities

5. **As per prescribed syllabus, Suryabhedan Pranayam is recommended for**

   (A) Obesity (B) Hypertension (C) Asthma (D) Back pain

6. **Identify the asana**



   (A) Chakrasana (**B) Dhanurasana** (C) Halasana (D) Ushtrasana

   (For Visually Impaired Candidates Only)

   Which one of the following is the correct pose of Paschimottanasana?

   (A) Forward bending in a standing position. **(B) Forward bending in the sitting position**.

   (C) Head raised in the prone position. (D) Head raised in the supine position.

7. **Given below are two statements, one of which is labelled as Assertion (A) and other is labelled as Reason (R). Read both the statements carefully:**

Assertion (A): The International Paralympic Committee (IPC), has developed a classification process which can contribute "to sporting excellence for all athletes and sports in the Paralympic Movement, and provide equitable competition.

Reason (R): The classification process serves two roles. The first is to determine who is eligible and the second is to grouping the sports people for the purpose of competitions.

In the context of the above two statements, which one of the following is correct?

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.

8. _____ **are the colours, that represent the four regional confederation in the** Deaflympic logo.

(A) Red, blue, black and yellow (B) Blue, yellow, black and red

(C) Red, blue, yellow and green (D) Blue, black, red and yellow

9. **What type of lever has the load / resistance between the fulcrum and the force?**

(A) First class lever **(B) Second class lever** (C) Both (A) and (B) (D) Third class lever

10. **The scientific name of Vitamin 'C' is**

(A) Betadine acid **(B) Ascorbic acid** (C) Acetonic acid (D) Hydrochloric acid

11. **Given below are two statements, one of which is labelled as Assertion (A) and other is labelled as Reason (R). Read both the statements carefully:**

Assertion (A): The risk of cancer can be reduced by eating more colourful vegetables, fruits and other plant-foods that have certain phytochemicals in them.

Reason (R): Non-nutritive components of diet are part of balance diet.

In the context of the above two statements, which one of the following is correct?

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

12. **In which test, score is recorded to the nearest centimetre between the initial and final score?**

(A) Partial curl-up (B) Back stretch test **(C) Sit and reach test** (D) Chair sit and reach test

13. Given below are types of fractures in List - I with their features in List - II:

List - I (Types of Fractures)	List - II (Features)
(A) Transverse	i. Bone breaks diagonally
(B) Oblique	ii. Bone is crushed into number of pieces
(C) Green stick	iii. Straight break right across a bone.
(D) Comminuted	iv. Soft bone, in which bone bends

Match the items of List I with List II and choose the correct option from the following:

(A) (B) (C) (D)

(A) iii iv ii i

(B) iii i iv ii

(C) i ii iii iv

(D) ii iii iv i

14. "The golf ball remains at rest until it is struck by a golf club." This statement indicates -

(A) Law of Inertia (B) Law of Acceleration (C) Law of Gravity (D) Law of Reaction

15. **Given below are traits of the big five theories of personality in List - I with their** characteristics in List - II:

List-I (Traits of Big 5)	List-II (Characteristics)
(A) Openness	i. Active, optimistic and social
(B) Extroversion	ii. Insecure, nervous and anxious
(C) Neuroticism	iii. Creative, focused on tackling new challenges and curious
(D) Agreeableness	iv. Friendly, helpful and trustworthy

Match the items of List I with List II and choose the correct option from the following:

(A) (A) iii (B) i (C) ii (D) iv **(B) (A) iii (B) iv (C) i (D) ii**

(C) (A) iv (B) ii (C) iii (D) I (D) (A) iv (B) i (C) ii (D) iii

16. **The concept of __ generally refers to a person's evaluation of, or attitude towards, him or herself.**

(A) Mental-imagery **(B) Self-esteem** (C) Self-talk (D) Goal-setting

17. The Swedish word speed play is also known as

(A) Fartlek training (B) Interval method (C) Continuous method (D) Pace method

18. In which type of exercises movement can NOT be seen directly?

(A) Iso-tonic (B) Iso-kinetic **(C) Iso-metric** (D) Plyometric

SECTION-B
(Attempt any 5 questions.)

19. Suggest any two corrective measures for each, bow legs and round shoulders.

Ans. Corrective measures for bow-leg –

- Walk on the inner edge of the feet

- Perform/Practice Garudasana
- Perform lunges (leg strengthening exercises)
- Wearing of braces and modified shoes
- Corrective measures for round shoulder:
- T-stretch, wall stretch, Handclasp stretch and planks, pull-ups,
- reverse shoulder stretch, etc.
- Developing the habit of keeping the spine straight is also helpful in
- correcting rounded shoulders.
- Perform asanas like Chakrasana, Dhanurasana,
- Ushtrasana, Bhujangasana
- Shoulder rotation clockwise and anticlockwise

(Any two corrective measure for each)

20. Enlist four benefits of participation in physical activities for children with special needs.

Ans. 1. Physical benefits –

- Improves motor skills
- Improves flexibility and mobility
- Builds strength, endurance, and speed
- Supports cardiovascular health

2. Psychological benefits-

- Builds confidence and boosts self-esteem.
- Reduces stress and anxiety
- Enhances focus and attention
- Develop a sense of achievement

3. Social benefits–

- Enhances Team work
- Improves communication skills
- Develops Leadership
- Promotes inclusion

4. Emotional benefits

- Elevates mood
- Encourages positive attitude
- Develops resilience

- Reduces fear

(any four points)

21. Enumerate any two myths related to food items with their respective facts.

Ans. Enumerate any two myths related to food items with their respective facts.

Myth: The fewer the carbohydrates, healthier you are-

Fact: Choosing the healthiest carbohydrates especially whole grains is important for health and well-being and is required in larger quantity.

Myth: Oils/Margarine have fewer calories than Ghee/butter-

Fact: Ghee/Butter and Oils/ Margarine have about the same amount of calories. Some margarines are actually unhealthier because they contain trans-fats, which have even more adverse effects on cholesterol and heart health.

Myth: Apples and brinjals are rich in iron because they turn brown when cut-

Fact: They are an excellent source of fibre but not of iron. This change in colour is an enzymatic reaction and has nothing to do with iron.

Myth: Drinking water in between meals affects digestion-

Fact: The truth is that drinking water simply fills up the stomach and as a result one tends to eat less which is especially good when someone is trying to lose weight.

Myth: Vegetarian diet does not build muscle

Fact: Vegetarians derive Protein required for muscle growth from grain, pulses (dals) & Soya bean, milk and milk product.

(Any two or any other myths with their respective facts.)

22. Mention the fitness index score formula and its norms for the HARVARD Step Test.

- Fitness Index Score Formula:
- Fitness Index = (100 × Test Duration in Seconds) / (2 × Sum of heartbeats in recovery periods)

  - Norms:
    1. Excellent: Above 90
    2. Good: 80-89
    3. Average: 65-79
    4. Below average: 55-64
    5. Poor: Below 55

23. Mention any two strategies for enhancing adherence to exercise.

Ans. strategies for enhancing adherence to exercise are:

1. Set realistic goals
2. Create a routine
3. Choose enjoyable activities
4. Track progress
5. Find a workout buddy/partner

6. Incorporate variety
7. Work load according to physical capacity
8. Focus on benefits
9. Mindful expectations
10. Advance communication about activity, space, resource person should be communicated clearly
11. Approachable space
12. Appropriate equipment
13. Age appropriate graded activities (Any two)

24. When wrestlers fall on the mat, why they spread their arms, knee and legs? Justify your answer.

Ans. As per the guiding principles of equilibrium and centre of gravity, the stability of an athlete depends on his/her COG. It is exactly in the middle of the body around which it can

rotate freely in any direction and where the body weight is centred. Wrestlers always spread their feet, arms, knees and legs on the mat and make COG come down.

-May reduce the chances of injuries

-Maintain balance and stability,

- Broader the base, greater the stability.

- Lower the centre of gravity, higher the stability.

SECTION-C

(Attempt any 5 questions.)

25. "The organisation of its community sports reflects the progress of any country." In the context of this statement, outline 'Run for a specific cause' and 'Run for unity'.

Ans. **Run for a Specific Cause:** This event is generally conducted to spread awareness about social issues like cleanliness, promoting a green environment, etc. The purpose of such events is to spread awareness among the masses for a specific cause or to generate charity. For example, the specific cause may be cancer, AIDS, gender inequality, etc.

Run for Unity :

In such a type of run, the purpose is to foster peace, promote the feeling of integrity and brotherhood in the community, state, nation or among different religions. Such events help to develop bonding and a sense of togetherness among people cutting across social and economic barriers.

26. Describe the physical and psychological benefits of women's participation in sports.

Ans

Physical benefits of women's participation in sports-

1. Reduce the chances of lifestyle diseases i.e. Diabetes, High blood pressure, Obesity etc.

2.Tones muscles

3.Improves cardiovascular system

4.Improves bone density

5.Improves reproductive health

6.Better sleep pattern

7.Improves posture and flexibility

Psychological benefits of women's participation in sports

1.Reduces stress and anxiety

2.Improves mood and emotional well being

3.Improves self esteem

4.Better cognitive function

5.Improves sleep quality

6.Improves focus and concentration

7.Promotes goal setting skills

8.Develops leadership qualities

(any 3 points explaineD)

27. Define flexibility. Explain the methods to improve flexibility for a gymnast.

Ans. Flexibility –Flexibility is known as the range of motion around a joint

or

It is the ability to execute a movement with greater amplitude or range

Methods to improve flexibility:

1.Slow Stretching

2.Slow Stretch and Hold

3.Static Stretching

4.Dynamic Stretching

5.Ballistic Method

6.Proprioceptive Neuromuscular Facilitation (PNF) Technique

(Explanation of any two methods)

28. Mention any three importance of diet during competition.

1. Dealing with nutritional needs during training is crucial for optimal performance. The main aim during exercise and training should be to maintain water balance, control body temperature, sustain normal blood sugar levels and delay fatigue. Water that is lost through sweating during exercise needs to be replaced, in order to maintain fluid balance and normal temperature. Even slight dehydration brings in mental and physical fatigue and weakens the performance.

2. During small breaks in the events, such as tennis, boxing, etc., the consumption of adequate carbohydrates and fluids may be taken care of. In shorter breaks, carbohydrate-rich foods like bananas, juices, carbohydrate-based drinks (less than 2 percent concentration) or simply water may be taken.

3. If exercising for more than 60 minutes, carbohydrate electrolyte beverages like diluted fruit juices containing 5 percent to 8 percent carbohydrates can be ingested.

4. As the duration of high intensity events continues, muscle glycogen levels diminish. Therefore, for endurance athletes, in events lasting longer than two hours, carbohydrate-rich solids or liquid meals are recommended during exercise.

5. Carbonated beverages, fizzy drinks and drinks that contain caffeine are not recommended.

(Any three points)

29. Describe the following: (A) Residual Volume (B) Stroke Volume

Ans. Residual volume: Residual volume is the volume of air that remains in the lungs after forceful expiration. Regular exercise increases residual volume that helps to exchange the gases in normal limits. Stroke Volume: The volume of blood pumped during one beat (contraction) is called stroke volume. During exercise, stroke volume increases as more oxygen is required. This is accomplished by delivering blood to muscles. After an endurance training programme, the capacity of the heart to pump blood in one contraction is increased by 20 to 50 percent.

(Or any other relevant answer)

30. Compare and contrast the hostile and instrumental aggression.

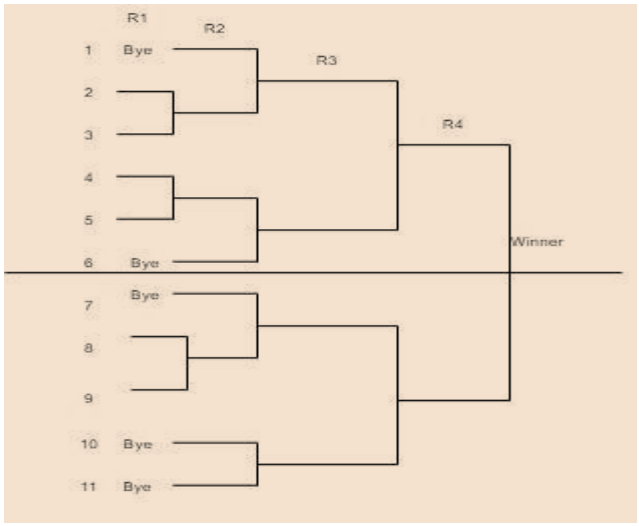
Ans.

	Hostile	**Instrumental**
Intent	Harm or Suffering	Harm or Suffering
Primary Goal	Harm or injure	Win or advantage
Process	Non-Legitimate	Non-Legitimate
Emotion	No Anger	No Anger
Explanation	Self-justification instead of apology	Offer apologies

(any 3 points)

SECTION-D
(Internal choices available)

31. Aarti prepared a fixture of 11 teams to conduct Kho-Kho tournament in her locality as shown below:



Based on the above given fixture, answer the following questions:

(i) What is the number of Non-bye teams in this tournament?

(A) 06 (B) 07 (C) 08 (D) 09

(ii) If the above fixture had been of 48 teams, then the number of byes would have been-

Ans. 16

(iii) 7th match will be played between team number 10 and 11.

OR

Write the formula to calculate byes in lower half.

Ans. $\frac{NB+1}{2}$

(iv) The provision in which good teams are placed in different half or pool, based on their ranking or previous performance not by allotment of draw, so that they do not play with other teams in the first round is known as

(A) Bye (B) British method **(C) Seeding** (D) American method

(For **Visually Impaired** Candidates Only)

Tarun's physical education teacher gave him the responsibility of organizing a Kabaddi competition in school. Tarun along with his classmates formed several committees and prepared a knockout fixture of 17 teams for the Kabaddi tournament. He faced many challenges in organizing the match, but finally, he was successful. Answer the following questions based on the above case and your prior knowledge:

(i) How many matches will be played in this tournament?

Ans.16

(ii) _____ saves cost and time and makes each match intensive because of fear of elimination.

(A) Knockout tournament (B) League tournament

(C) Round robin tournament (D) Combination tournament

(iii) Two team players got injured during the match, which committee will manage it?

(A) Logistics committee (B) Technical committee

(C) Finance committee (D) Marketing committee

(iv) Which formula was used to allot byes to the above teams in the lower half?

Ans. $\frac{NB+1}{2}$

OR

Which formula was used to allot byes to the above teams in the upper half?

Ans. $\frac{NB-1}{2}$

32. During the Physical Education class, Vivek's physical education teacher provided information about sports for children with special needs. He explained, how they are catered for the Paralympics, Deaflympics and Special Olympics. Additionally, he advised them to motivate such children to participate in physical activities to improve their performance. Answer the following questions based on the above case and your prior knowledge:

(i) To participate in Special Olympic, minimum age should be _____ years old.

(A) 7 (B) 6 **(C) 8** (D) 9

(ii) The first Deaflympics was held in the year 1924.

(iii) Who was the founder of the Paralympics? Ans. Sir Ludwig Guttmann

(iv) Write any two strategies to make physical activities accessible for special children.

Ans.

1. **Proper instructions**
2. **Proper space**
3. **Adapted equipment**
4. **Modified rules**
5. **Graded activities**
6. **Social strategies**
7. **Involve people with disability in decision making**
8. **Regular medical check up**

(any 2 points or any other relevant points)

33. Diya went to sports training centre for the first time. Her coach informed her that participation in sports not only promotes physical growth but also has social and psychological benefits. He highlighted numerous physical benefits for muscles, heart and respiratory systems. He advised her to continue daily practice to improve her health related and skill related fitness. Answer the following questions based on the above case and your prior knowledge:

(i) Which is not a long-term effect of exercises on the muscular system?

(A) Hypertrophy of muscle (B) Increase in glycogen stored

(C) Ligament and tendon strengthen **(D) Accumulation of lactate**

(ii) What is cardiac output?

Cardiac output is the amount of blood pumped out by the heart in 1 minute.

or

Stroke volume x heart rate=cardiac output

(iii) Choose the correct statement related to tidal volume:

(A) Amount of air inhaled and exhaled in one breath.

(B) Amount of air inhaled in one breath

(C) Amount of blood pumped out by heart in one stroke. (D) Amount of air exhaled in one breath

(iv) Lactic acid tolerance relates to _____.

(A) Strength (B) Speed (C) Flexibility **(D) Endurance**

SECTION-E

(Attempt any 3 questions.)

34. Describe the procedure and benefits of Mandukasana and Makrasana to control hypertension.

Ans.

Mandukasana : Mandukasana comes from the Sanskrit word 'Manduk' which means frog. This yoga asana is aptly named frog pose as your body resembles a frog when you practice it.

This yoga asana is fairly straightforward and can be practiced by almost all age groups.

Procedure:

• Sit in Vajrasana and make fists with both hands, the thumbs inside.

• Place your fists on your belly next to the belly button.

• Bend forward with exhalation.

• Keep looking straight.

• Hold your breath in the yoga posture for a few seconds and come up with inhalation.

• Repeat this asana 3-4 times.

Benefits :

• This asana is beneficial to all organs of the body.

• Mandukasana gives you relief from diabetes, digestive disorders and constipation.

• This asana improves the flexibility and mobility of the knee and ankle joints.

• It helps tone muscles of the shoulder and abdomen.

• Regular practice of this asana increases your lung capacity: This yoga asana is beneficial for people suffering from problems of the pancreas and the heart.

• This asana helps reduce fat from thighs, bellyand hips.

Makarasana :

Makar means crocodile. While doing this asana the bodyresembles the shape of a crocodile, hence it is known as Makarasana. It is also considered a relaxing asana like Shavasana.

Procedure :

1. Lie down on the floor on your stomach with your hands folded under the head.
2. Place the right palm over the left palm on the ground and place the head over the right palm in a relaxed way and close your eyes.
3. Stretch the leg as far as possible. The toes should point outwards.
4. Relax the whole body. Breathe normally and slowly feel the whole body touching the ground and the deep relaxation in all your muscles. 5. Relax in this posture for few minutes.
6. While returning from the posture, slowly bring the feet together unfold the arms and come to the prone position.

Benefits :

- Deep relaxation to the shoulder and the spine.
- Reduces waist pain.
- Helps in slipped disc.
- Beneficial for asthma
- Relief for arthritis patients.
- Abdominal muscles get an automatic massage.

(any 2 benefits for each)

35. What do you mean by Equilibrium? Explain how Equilibrium increases with the influence of various factors by giving suitable examples from sports.

Equilibrium-
State of balance or a stable situation where opposite forces cancel each other and where no changes occur.

Or

Condition in which the sum of all forces acting on a body is zero, causing it to remain at rest or move with constant velocity.

- Lower centre of gravity means more stability: Athletes lower their centre of gravity to improve stability during activities. For example, runners bend their knees to stop more quickly and effectively. Similarly, a wrestler adopts a half –sitting posture for better balance, and shot-put thrower bends their knees for better stability to avoid foul.

- Stability increases when centre of gravity is centred:
  Balance is lost if centre of gravity moves outside the support base. Keeping the weight centred over the support base enhances stability. For instance, balance is easily lost in activities like walking on a balance beam with narrow support base. If balance shifts, the gymnast might raise an arm or leg to bring the centre of gravity back to the centre.

- Wider base of support enhance stability: Spreading the support base, like standing with feet apart adds stability. Using stance requiring both hands and feet, creates the most comprehensive base and, hence more stability.

- Body weight is directly proportional to stability:
  A heavier person or gravity or object is more stable and more challenging to move. This principle is applied in sports like Boxing, Judo, Wrestling, where competitors are classified by weight.

- More the friction on the surface more the stability: If the surface of a sport or activity has more friction, it leads to greater stability. For example, if the friction on a wrestling mat is less, wrestler will tend to slip.

(Any four factors with any suitable example)

36. What do you understand by circuit training? How a coach will plan circuit training sessions with 6 stations to develop fitness of his new trainees? Explain.

Ans. Circuit training method was introduced by R.E morgan and G.T. Admson of Leeds university in 1951. It is the training method in which certain exercises of various kinds are performed with or without apparatus with given dosage.

A coach planning a circuit training session for new trainees must consider their fitness level goals and variety of exercises. Each station should focus on different component
of fitness such as strength, endurance, agility and flexibility.

Coach can plan following stations to develop fitness of his
new trainees –
1.Push ups
2.Jump squat
3.Rope skipping
4.Pull ups
5.Shuttle run
6.Arm curling
7.Shoulder press
8.Burpees
9.Step ups
10.Lunges
11.Medicine ball throw
12.Sit ups
13.Spot running
14.Bench press
15.Exercises with dumbbells

(Any 6 or any other relevant stations)

37. Write in detail the procedure and scoring of 'Flamingo Balance Test' and Plate Taping Test' recommended for the age group 5–8 years by SAI Khelo India.

Procedure Flamingo Balance Test:

- Stand on the beam. Keep the balance by holding the instructor's hand (if required to start). Start the watch as the instructor let goes of the participant/subject.
- Pause the stopwatch each time the subject loses balance (either by falling off the beam or letting go of the foot being held). Resume over, timing again until they lose balance.
- Count the number of falls in 60 seconds of balancing.
- If there are more than 15 falls in the first 30 seconds, the test is terminated.

- Scoring: The total number of falls or loss of balance in 60 seconds of balancing is recorded. If there are more than 15 falls in the first 30 seconds, the test is terminated.
- Procedure for Plate Tapping Test: If possible, the table height should be adjusted so that the subject may stand comfortably in front of the discs. The two yellow discs are placed with their centers 60 cm apart on the table. The rectangle is placed equidistant between both discs. The non-preferred hand is placed on the rectangle.
- The subject moves the preferred hand back and forth between the discs over the hand in the middle as quickly as possible. This action is repeated for 25 full cycles (50 taps). Scoring: The time taken to complete 25 cycles is recorded.

PRACTICE QUIZ

GENERAL INSTRUNCTIONS:-

1. Scene the QR codes to access exciting Google Quizzes tailored to Specific Unit.
2. You're encouraged to take these Quizzes to reinforce your understanding and test your knowledge.
3. Once you submit your answers, you'll instantly see your score and learn from any mistakes by reviewing the correct answers.

TOPICS	O R
1. MANAGEMENT OF SPORTS EVENTS	
2. CHILDREN AND WOMEN IN SPORTS	
3. YOGA AS PREVENTIVE MEASURE FOR LIFESTYLE DISEASE	
4. PHYSICAL EDUCATION & SPORTS FOR CWSN	
5. SPORTS AND NUTRITION	
6. TEST AND MEASURMENT IN SPORTS	
7. PHYSIOLOGY AND INJURIES IN SPORTS	
8. BIOMECHANICS AND SPORTS	
9. PSYCHOLOGY AND SPORTS	
10. TRAINING IN SPORTS	

TOPICS	LESSON PLAN UNIT WISE (XII)	Q R
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