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# Answer Key

## Chapter 2

### Revise, Reflect, Refine

2. (iii) 4. (i) 7. (ii) 11. (iii)  
 16. (i) Osmosis  
 (ii) Concentration of salt or sugar is higher than the cell sap of bacterial or fungal cell, and therefore, water inside the cell comes out due to osmosis.

## Chapter 3

### Revise, Reflect, Refine

1. (iii) 2. (iii) 3. (ii) 5. (iii)  
 6. A (iii) B (i) C (iv) D (iii)

## Chapter 4

### Pause and Ponder

4.  $80 \text{ km h}^{-1}$ ;  $0 \text{ km h}^{-1}$

### Revise, Reflect, Refine

1. 1000 m; 0 m  
 2. (i) 18 m (ii) 6 m in upward direction  
 3. Yes, Yes, different  
 4.  $4 \text{ m s}^{-2}$  in the direction of velocity, 72 m  
 5.  $-4 \text{ m s}^{-2}$  in the direction opposite to the velocity; 7 s  
 6. No 7. (i); (ii)  
 8. 450 m 9. 310 m  
 10. 25 m; Yes 12.  $320 \text{ m}$ ;  $\frac{1}{60} \text{ m s}^{-2}$   
 14. 774 m 15. 12.5 m; 15 m  
 16. (i) 66 cm (ii) 14 cm  
 (iii)  $\frac{11}{900} \text{ cm s}^{-1}$  (iv)  $\frac{7}{2700} \text{ cm s}^{-1}$

## Chapter 5

### Pause and Ponder

1. 12 g 2. 20 % v/v

### Revise, Reflect, Refine

1. (iv) 2. (iii)  
 4. (i) % m/m; Sugar = 15%; All-purpose flour = 84%; Sodium hydrogencarbonate = 1%  
 (ii) Copper = 84 g; Zinc = 36 g  
 6. (iii)  
 14. (i) Student A = 20%; Student B = 16.67%; Student C = 27.27%  
 (ii) Student C

## Chapter 6

### Pause and Ponder

2. No; S 3. No 4. (i); (ii)  
 6. 0 N

### Revise, Reflect, Refine

1.  $F$  in the direction opposite to the applied force.  
 2. (i) same (ii) increase (iii) decrease  
 3. (i) 4. 18,000 N in the forward direction  
 5. (iv) 6. (iii)  
 9. (iv) 11. 25 N

12. 500 N in the direction opposite to the motion  
 13. 0.015 s 14. 10 m

$$15. \frac{a_1 a_2}{a_1 + a_2}$$

## Chapter 7

### Pause and Ponder

1. No 2. Negative  
 4. 2:1 5. No  
 6. No; yes

### Revise, Reflect, Refine

1. (i) F (ii) T (iii) T  
 (iv) F (v) T  
 2. (i) Force; Displacement  
 (ii) 1 (iii)  $\frac{1}{2}mv^2$   
 (iv)  $mgh$  (v) rate  
 3. (iii); (iv)  
 5. (i) 36250 J (ii) 36250 J  
 (iii) does not depend upon the path  
 6. Energy twice of initial energy; power same as initial power  
 8. 4:5  
 10. (i) Negative and positive (ii) -12 J  
 11.  $6 \text{ m s}^{-1}$ ;  $\sqrt{66} \text{ m s}^{-1}$ ; No  
 12. 48 m  
 13. (i) with constant speed  
 (ii) 612500 J (iii) -612500 J  
 (iv) potential energy  
 14.  $2\sqrt{10} \text{ m s}^{-1}$ ;  $0 \text{ m s}^{-1}$ ; The ball cannot reach position R  
 15. (i)  $10\sqrt{2} \text{ m s}^{-1}$  in the direction of motion  
 (ii) 0.05 m

## Chapter 8

### Pause and Ponder

7. (ii)  
 10. Electrons 26; Protons 26; Neutrons 30  
 11. Neutrons 21 12. Mass number 35  
 13. Neutrons 12  
 14. (i) 4 (ii) 7 (iii) 4  
 15. 2, 8, 2; 2, 8, 6; 2, 8, 8 16. Sodium; 12  
 18. 80.006 u

### Revise, Reflect, Refine

1. (ii), (iii) are correct 2. (iii) is correct  
 3. (i) Isotopes (ii) Isobars  
 7. (ii)  
 8. (i) Protons 12 (ii) Neutrons 12  
 (iii) Electrons 12;  
 Electronic configuration 2, 8, 2  
 9. (a) (i) Lithium; (ii) Li; (iii) 3; (iv) 1; (v) 1; (vi) 3; (vii) 3  
 (b) (i) Nitrogen; (ii) N; (iii) 7; (iv) 5; (v) 3; (vi) 7; (vii) 7  
 (c) (i) Aluminium; (ii) Al; (iii) 13; (iv) 3; (v) 3; (vi) 13;  
 (vii) 13  
 (d) (i) Fluorine; (ii) F; (iii) 9; (iv) 7; (v) 1; (vi) 9; (vii) 9  
 11. Neutrons 39

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12. (i) Neutrons 118 (ii) Electrons 79  
13.

Atomic number	Mass number	Number of neutrons	Number of protons	Number of electrons	Name of the element
5	11	6	5	5	Boron
7	14	7	7	7	Nitrogen
12	24	12	12	12	Magnesium
15	31	16	15	15	Phosphorus
1	1	0	1	1	Hydrogen

14. (i) Electrons 17; Protons 17  
(ii) Atomic number 17  
(iii) Chlorine  
(iv) Electronic configuration 2, 8, 7  
(v) Valence electrons 7  
(vi) Mass number 37  
(vii) Isotopes

### Chapter 9

#### Pause and Ponder

2. 180 g  
4. 12 g  
12. Anion ( $O^{2-}$ )  
16. (i) Carbon dioxide (ii) Nitrogen dioxide  
(iii) Sulfur hexafluoride  
(iv) Phosphorous trichloride  
17. (i)  $NaHCO_3$  (ii)  $SO_2$   
(iii)  $FeCl_3$  (iv)  $Cu_2O$   
18. (i)  $Fe(OH)_3$  (ii)  $K_2CO_3$   
20. (i) MO (ii) Ionic  
(iii) Conducts electricity in aqueous solution  
21. 63 u  
23. 74.5 u

#### Revise, Reflect, Refine

1. (i) tends to give 1 electron  
(ii) Cation ( $A^+$ )  
(iii) tends to take 2 electrons  
(iv) Anion ( $B^{2-}$ )  
(v) Ionic  
(vi)  $A_2B$   
3. (iii)  
5. (i)  $Al(NO_3)_3$  (ii) CaO  
(iii)  $Fe_2O_3$   
6. (i)  $CaBr_2$  (ii)  $Al_2(CO_3)_3$   
(iii)  $K_2SO_4$  (iv)  $NH_4Cl$   
7. (ii)  
8. (i) 80 u (ii) 98 u  
(iii) 84 u  
9. (i)  $Mg_3N_2$  (ii)  $Li_3N$   
(iii)  $Na_2S$  (iv)  $Al_2O_3$   
10.

	$NO_3^-$	$SO_4^{2-}$	$PO_4^{3-}$
$NH_4^+$	$NH_4NO_3$	$(NH_4)_2SO_4$	$(NH_4)_3PO_4$
$Li^+$	$LiNO_3$	$Li_2SO_4$	$Li_3PO_4$
$Al^{3+}$	$Al(NO_3)_3$	$Al_2(SO_4)_3$	$AlPO_4$
$Cu^{2+}$	$Cu(NO_3)_2$	$CuSO_4$	$Cu_3(PO_4)_2$

12. (i)  $Z = 11; A = 23$   
(ii) Cation  
(iii) Electronic configuration 2, 8  
(iv) Sodium cation ( $Na^+$ )  
13. (i) Element B  
(ii) Covalent  
(iii)  $AB_3$   
14. (iii)  
15. Electrons 13, Neutrons 14; Electrons 36,  
Neutrons 45; Electrons 78, Neutrons 121

### Chapter 10

#### Pause and Ponder

3. (ii)  
5. (ii)  
9. 1.5 cm  
10. (i) 75:17  
11. 0.932 s; Yes  
13. 3000 m  
4. (iii)  
8. 1200 oscillations  
(ii) 10:3  
12. 34.3 m

#### Revise, Reflect, Refine

1. (ii)  
3. 5 Hz  
5. (i) (a)  
6. A - Green curve; B - Red curve; C - Blue curve  
9. 0.01 s  
11. 0.007 s  
13. 0.04 m; 8500 Hz  
14. 0.025 m, 0.05 m; 13800 Hz, 6900 Hz  
15. 2:9  
2. (iii)  
(ii) (a)  
10. 3812.5 m  
12.  $\frac{65}{331}$  s

### Chapter 11

#### Pause and Ponder

5. Internal Fertilisation  
6. Adolescence  
7. 2nd April  
8. 46 Chromosomes

#### Revise, Reflect, Refine

1. (iii)  
2. Correct sequence is (iii), (i), (ii), (iv)  
3. (iv)  
11. Tomato—self pollination; wheat—self pollination;  
papaya—cross pollination

### Chapter 12

#### Revise, Reflect, Refine

1. (ii) 2. (iii)  
15. (i) Q (ii) P, characterised by no true nucleus  
(iii) both can be classified based on level of  
organisation, the organism Q is multicellular  
and organism R is unicellular  
(v) There is no place for acellular entities

### Chapter 13

#### Revise, Reflect, Refine

1. (ii) 2. (iii)

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