

**05**

# All India Test Series

## NEET (2024-25)

**DURATION: 180 Minutes****DROPPER****M. MARKS: 720**DATE: 23/02/2025**ANSWER KEY**

1. (2)	46. (3)	91. (1)	136. (1)
2. (3)	47. (1)	92. (2)	137. (4)
3. (3)	48. (1)	93. (1)	138. (3)
4. (2)	49. (2)	94. (3)	139. (3)
5. (3)	50. (3)	95. (3)	140. (2)
6. (2)	51. (1)	96. (2)	141. (2)
7. (2)	52. (2)	97. (4)	142. (1)
8. (4)	53. (3)	98. (3)	143. (3)
9. (4)	54. (1)	99. (4)	144. (4)
10. (1)	55. (1)	100. (4)	145. (3)
11. (1)	56. (2)	101. (2)	146. (4)
12. (3)	57. (4)	102. (1)	147. (3)
13. (3)	58. (3)	103. (2)	148. (3)
14. (1)	59. (1)	104. (3)	149. (2)
15. (3)	60. (3)	105. (2)	150. (1)
16. (2)	61. (2)	106. (1)	151. (3)
17. (1)	62. (3)	107. (3)	152. (3)
18. (2)	63. (4)	108. (4)	153. (4)
19. (3)	64. (4)	109. (1)	154. (1)
20. (1)	65. (1)	110. (3)	155. (4)
21. (1)	66. (4)	111. (4)	156. (4)
22. (3)	67. (3)	112. (1)	157. (1)
23. (2)	68. (4)	113. (4)	158. (2)
24. (1)	69. (3)	114. (1)	159. (3)
25. (2)	70. (3)	115. (3)	160. (2)
26. (4)	71. (3)	116. (4)	161. (1)
27. (1)	72. (4)	117. (1)	162. (4)
28. (3)	73. (2)	118. (2)	163. (3)
29. (4)	74. (1)	119. (4)	164. (4)
30. (2)	75. (3)	120. (1)	165. (2)
31. (3)	76. (1)	121. (2)	166. (3)
32. (4)	77. (3)	122. (2)	167. (2)
33. (3)	78. (2)	123. (2)	168. (3)
34. (2)	79. (2)	124. (2)	169. (2)
35. (2)	80. (3)	125. (1)	170. (3)
36. (2)	81. (3)	126. (3)	171. (2)
37. (1)	82. (3)	127. (2)	172. (2)
38. (2)	83. (3)	128. (2)	173. (2)
39. (4)	84. (4)	129. (3)	174. (4)
40. (2)	85. (1)	130. (3)	175. (2)
41. (4)	86. (1)	131. (3)	176. (2)
42. (3)	87. (1)	132. (2)	177. (3)
43. (4)	88. (2)	133. (3)	178. (2)
44. (4)	89. (4)	134. (1)	179. (3)
45. (3)	90. (1)	135. (2)	180. (2)

## HINTS & SOLUTIONS

1. (2)

$$s_1 = \frac{1}{2} a(\beta - 1)^2$$

$$s_2 = \frac{1}{2} a\beta^2$$

$$\frac{s_1}{s_2} = \frac{(\beta - 1)^2}{\beta^2}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 17, 18)

2. (3)

$$\Delta Q = nC_p \Delta T \quad \dots(1)$$

$$W = P\Delta V = nR\Delta T = 80 \quad \dots(2)$$

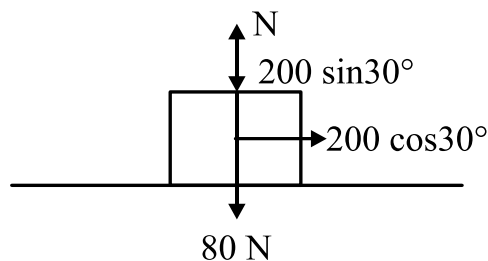
From (1) and (2)

$$\Delta Q = \frac{80}{R} \times C_p$$

$$= \frac{80}{R} \times \frac{7R}{2} = 280 \text{ Joule}$$

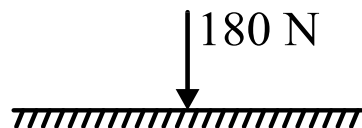
(NEW NCERT Class 11<sup>th</sup> Page No. 233, 234)

3. (3)



$$N = 80 + (200 \sin 30^\circ)$$

$$N = 180 \text{ N}$$



(NEW NCERT Class 11<sup>th</sup> Page No. 60, 61)

4. (2)

As per Kepler's second law:  $\left| \frac{d\vec{A}}{dt} \right| = \left| \frac{\vec{L}}{2m} \right|$

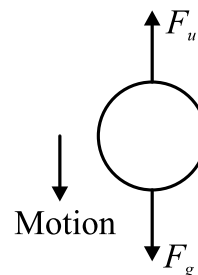
$$10^3 = \frac{2 \times 10^6}{2m}$$

$$m = 10^3 \text{ kg}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 137, 138)

5. (3)

Work done by  $F_g$  is positive.



Work done by  $F_u$  is negative.

From work-energy theorem, Work done by all force  $= \Delta K. E = 0$

(NEW NCERT Class 11<sup>th</sup> Page No. 75, 76)

6. (2)

$$R_A = R_B$$

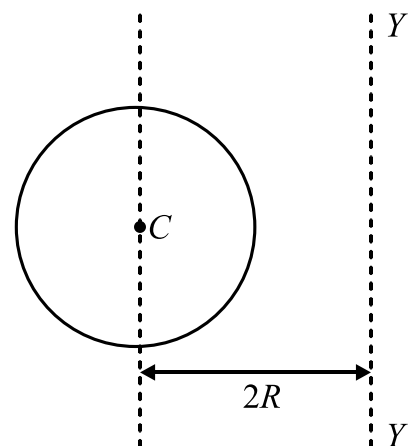
$$(V_A \cos 45^\circ) \times t_A = (V_B \cos 30^\circ) \times t_B$$

$$V_A \times \frac{t_A}{\sqrt{2}} = V_B \times \frac{\sqrt{3}}{2} \times t_B$$

$$\Rightarrow \frac{t_A}{t_B} = \frac{3}{2}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 38, 39)

7. (2)



$$I_{COM} = \frac{MR^2}{2}$$

$$I_{YY'} = I_{COM} + M(2R)^2$$

$$= \frac{MR^2}{2} + 4MR^2 = \frac{9}{2} MR^2$$

(NEW NCERT Class 11<sup>th</sup> Page No. 114, 115)

8. (4)  
 $\omega = 4\pi$   
 $2\pi f = 4\pi$   
 $f = 2\text{ Hz}$   
 $f_{KE} = 2f = 4\text{ Hz}$   
**(NEW NCERT Class 11<sup>th</sup> Page No. 268, 269)**

9. (4)  
 Internal force cannot change the state of motion of centre of mass.  
 $(V_f)_{COM} = (V_i)_{COM} = 0$   
**(NEW NCERT Class 11<sup>th</sup> Page No. 99, 100)**

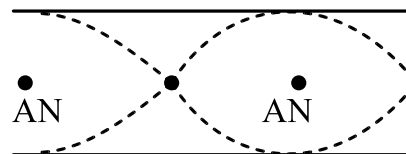
10. (1)  
 $Q = A \times v$   
 $= A \times \sqrt{2gh} = 10^{-4} \times \sqrt{2 \times 10 \times 20}$   
 $Q = 2 \times 10^{-3} \text{ m}^3/\text{s}$   
**(NEW NCERT Class 11<sup>th</sup> Page No. 188, 189)**

11. (1)  
 $A = L \times B = 16.2 \times 10.1 = 163.62$   
 Round off to three significant figures,  
 $A = 164 \text{ cm}^2$   
**(NEW NCERT Class 11<sup>th</sup> Page No. 3, 4)**

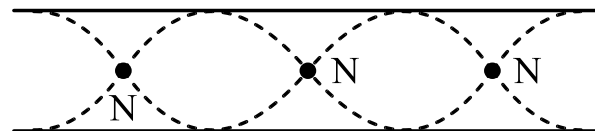
12. (3)  
 $\frac{x-20}{100} = \frac{80-0}{100}$   
 $x = 100^\circ\text{A}$   
**(NEW NCERT Class 11<sup>th</sup> Page No. 203, 204)**

13. (3)  
 $\beta = \frac{1}{2} \times Y \times (\text{strain})^2$   
 $\text{Strain} = \sqrt{\frac{2\beta}{Y}}$   
**(NEW NCERT Class 11<sup>th</sup> Page No. 174, 175)**

14. (1)  
 For close organ pipe  
 In 1<sup>st</sup> overtone we get 3<sup>rd</sup> harmonic



Number of antinodes ( $N_1$ ) = 2  
 For open organ pipe  
 In 2<sup>nd</sup> overtone, we get 3<sup>rd</sup> harmonic



Number of nodes ( $N_2$ ) = 3  
 $\frac{N_1}{N_2} = \frac{2}{3}$

**(NEW NCERT Class 11<sup>th</sup> Page No. 292, 293)**

15. (3)  
 Change in velocity = Area under acceleration-time graph  
 Acceleration = slope of velocity-time graph  
**(NEW NCERT Class 11<sup>th</sup> Page No. 16, 17)**

16. (2)  
 $v_2 = \frac{2m}{6m} \times u = \frac{u}{3}$   
 Percentage of kinetic energy transferred  

$$= \frac{\frac{1}{2}(5m)\left(\frac{u}{3}\right)^2}{\frac{1}{2}mu^2} \times 100 = 5 \times \frac{1}{9} \times 100 = 55.5\%$$
  
**(NEW NCERT Class 11<sup>th</sup> Page No. 84, 85)**

17. (1)  
 $(n+2)$  divisions of vernier scale =  $n$  divisions of main scale  
 1 vernier scale division =  $\frac{n}{n+2}$  main scale division  
 Least count = 1 MSD - 1 VSD =  $\left(1 - \frac{n}{n+2}\right)$  MSD  
 $= \left(\frac{2}{n+2}\right)$  MSD =  $\frac{2p}{n+2} \text{ cm}$   
**(OLD NCERT Class 11<sup>th</sup> Page No. 24, 25)**

18. (2)

$AB$  and  $CD$  are both isothermal process.

(NEW NCERT Class 11<sup>th</sup> Page No. 237, 238)

19. (3)

$$MOI = \frac{Ma^2}{12}$$

$$\frac{Ma^2}{12} = Mk^2$$

$$k = \frac{a}{\sqrt{12}}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 114, 115)

20. (1)

$$\text{K.E.} = \frac{1}{2}mv^2 = \frac{1}{2}m\left(2\sqrt{\frac{2GM}{R}}\right)^2$$

$$= \frac{4GMm}{R}$$

$$\text{P.E.} = \frac{-GMm}{R}$$

$$\text{K.E.} + \text{P.E.} > 0$$

(NEW NCERT Class 11<sup>th</sup> Page No. 135, 136)

21. (1)

$$B = \frac{-P}{\frac{\Delta V}{V}}$$

$$\text{Fractional change in volume} = \left| \frac{\Delta V}{V} \right| = \frac{P}{B}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 173)

22. (3)

Propagation of longitudinal wave forms compression and rarefaction which create pressure disturbance in the medium, hence these are called pressure wave.

(NEW NCERT Class 11<sup>th</sup> Page No. 280, 281)

23. (2)

$$d_i = 300 - 2 = 298 \text{ mm}$$

$$d_f = 300 \text{ mm}$$

$$d_f = d_i(1 + \alpha\Delta T)$$

$$300 = 298\left(1 + (1 \times 10^{-5}) \times \Delta T\right)$$

$$\Delta T = \frac{1}{149} \times 10^5 \text{ }^\circ\text{C}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 205, 206)

24. (1)

$$u = 36 \text{ km/hr} = 10 \text{ m/s}$$

$$-75 = 10t - \frac{1}{2} \times 10t^2$$

$$5t^2 - 10t - 75 = 0$$

$$t = 5 \text{ s}$$

Height of balloon from ground

$$= 75 + (5 \times 5) = 125 \text{ m}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 18, 19)

25. (2)

After cutting spring, block  $2m$  will be in the state of free fall.

(NEW NCERT Class 11<sup>th</sup> Page No. 53, 54)

26. (4)

Pressure of the gas

$$P = \frac{1}{3} \rho (v_{rms})^2$$

$$P = \frac{1}{3} \times 9 \times 10^{-2} \times (400)^2 = 4800 \text{ N/m}^2$$

(NEW NCERT Class 11<sup>th</sup> Page No. 249, 250)

27. (1)

$$\Delta U = T \Delta A$$

$$= T(8 \times 4\pi r^2 - 4\pi R^2)$$

$$\Delta U = T \left( \frac{8 \times 4\pi \times R^2}{4} - 4\pi R^2 \right) \left( r = \frac{R}{2} \right)$$

$$\Delta U = 4\pi R^2 T$$

(NEW NCERT Class 11<sup>th</sup> Page No. 193)

28. (3)

$$v_{x=0} = 0; v_{x=b} = \alpha b^{\frac{3}{2}}$$

$$W_{\text{All}} = \Delta KE = K_f - K_i$$

$$= \frac{1}{2} m (v_f^2 - v_i^2) = \frac{1}{2} \times m \left[ \left( \alpha b^{\frac{3}{2}} \right)^2 - 0 \right]$$

$$= \frac{1}{2} m \alpha^2 b^3$$

(NEW NCERT Class 11<sup>th</sup> Page No. 74, 75)

29. (4)

$$\text{Net torque about } A = (30 \times 20) - (20 \times 30) = 0 \text{ Nm}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 105, 106)

30. (2)

Amount of heat released = Amount of heat absorbed

Let final temperature of mixture =  $T$

$$100 \times 1 \times (60 - T) = (20 \times 80) + (20 \times 1 \times T)$$

$$\Rightarrow 6000 - 100T = 1600 + 20T$$

$$\Rightarrow T \approx 36.7^\circ\text{C}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 209, 210)

31. (3)

$$T = 2\pi \sqrt{\frac{l}{g_{\text{eff}}}}$$

$$T_1 = 2\pi \sqrt{\frac{l}{g}} = 2 \text{ second}$$

$$T_2 = 2\pi \sqrt{\frac{l}{g - \frac{g}{3}}} = 2\pi \sqrt{\frac{3l}{2g}}$$

$$T_2 = \sqrt{\frac{3}{2}} \times 2$$

$$= \sqrt{6} \text{ second}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 270, 271)

32. (4)

$$\vec{B} = \vec{A} \times \vec{C}$$

$\vec{B}$  is perpendicular to both  $\vec{A}$  and  $\vec{C}$ .

(NEW NCERT Class 11<sup>th</sup> Page No. 102, 103)

33. (3)

$$W = nRT \ln \left( \frac{P_1}{P_2} \right)$$

$$= 2RT \ln \left( \frac{16}{2} \right)$$

$$= (6RT \ln 2) \text{ J}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 234, 235)

34. (2)

Friction force oppose the relative motion between bodies.

Friction force is the component of net contact force parallel to the surface.

(NEW NCERT Class 11<sup>th</sup> Page No. 60, 61)

35. (2)

According to Kepler's Law,  $V_A < V_P$

Now, work done by gravitational force of sun

$$= \Delta K.E = \frac{1}{2} m (V_A^2 - V_P^2)$$

$\Rightarrow$  Work done by gravitational force is negative.

(NEW NCERT Class 11<sup>th</sup> Page No. 128, 129)

36. (2)

Apply conservation of energy,

$$\frac{-GMm}{3R} + 0 = \frac{-GMm}{2R} + K.E$$

$$K.E = \frac{-GMm}{3R} + \frac{GMm}{2R}$$

$$= \frac{1}{6} \frac{GMm}{R} = \frac{1}{6} mgR$$

(NEW NCERT Class 11<sup>th</sup> Page No. 133, 134)

37. (1)

The speed of sound in air is independent of pressure of the gas. It only depends on temperature of gas.

(NEW NCERT Class 11<sup>th</sup> Page No. 286, 287)

38. (2)

$$[\text{Coefficient of viscosity}] = [ML^{-1}T^{-1}]$$

$$[\text{Surface tension}] = [ML^0T^{-2}]$$

$$[\text{Angular momentum}] = [ML^2T^{-1}]$$

$$[\text{Rotational kinetic energy}] = [ML^2T^{-2}]$$

(NEW NCERT Class 11<sup>th</sup> Page No. 7, 8)

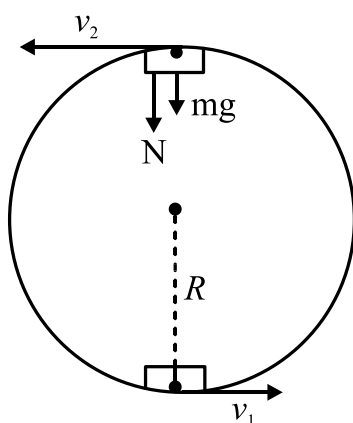
39. (4)

$$v_2 = \frac{A_1}{A_2} \times v_1$$

$$= \frac{\frac{\pi}{4}(4)^2}{\frac{\pi}{4}(2)^2} \times 1 = 4 \text{ m/s}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 187, 188)

40. (2)



$$\frac{1}{2}mv_1^2 = mg(2R) + \frac{1}{2}mv_2^2$$

$$\frac{(20)^2}{2} = (2 \times 10 \times 5) + \frac{v_2^2}{2}$$

$$200 - 100 = \frac{v_2^2}{2}$$

$$v_2 = 10\sqrt{2} \text{ m/s}$$

$$mg + N = \frac{mv_2^2}{R}$$

$$20 + N = \frac{2 \times 200}{5}$$

$$N = 60 \text{ newton}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 79)

41. (4)

$$\text{Acceleration} = R\omega^2$$

$$\omega = 2\pi n = 2\pi \times \frac{10}{50} = \frac{2\pi}{5} \text{ rad/s}$$

$$\text{Acceleration} = \frac{25 \times 4\pi^2}{25} = 4\pi^2 \text{ cm/s}^2$$

(NEW NCERT Class 11<sup>th</sup> Page No. 41, 42)

42. (3)

$$Q = \Delta U = U_f - U_i$$

$$= (2n) \left( \frac{3R}{2} T \right) + (N - n) \frac{5R}{2} T - \frac{5R}{2} (N) T$$

$$= 3nRT - \frac{5}{2}nRT$$

$$Q = \Delta U = \frac{nRT}{2}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 229, 230)

43. (4)

$$\tau = I\alpha$$

$$F \times R = I\alpha$$

$$40 \times 0.40 = 0.40 \times \alpha$$

$$\alpha = 40 \text{ rad/s}^2$$

$$\omega = 40 \times 4 = 160 \text{ rad/s}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 105, 106)

44. (4)

$$2\theta + 30^\circ = 90^\circ$$

$$\theta = 30^\circ$$

$$\frac{Y_A}{Y_B} = \frac{\tan(30^\circ + \theta)}{\tan(\theta)}$$

$$= \frac{\tan 60^\circ}{\tan 30^\circ} = 3$$

(NEW NCERT Class 11<sup>th</sup> Page No. 170)

45. (3)

To find fundamental frequency, take highest common factor of frequencies.

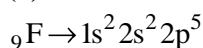
HCF of 395 Hz, 553 Hz, 711 Hz is 79 Hz.

$$79 = 2f$$

$$f = 39.5 \text{ Hz.}$$

(NEW NCERT Class 11<sup>th</sup> Page No. 292, 293)

46. (3)



For unpaired valence electron:

$$n = 2, l = 1, m = -1 \text{ to } +1, s = +1/2 \text{ or } -1/2$$

(NEW NCERT 11<sup>th</sup> Part-I Page No. 55)

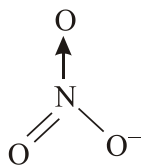
47. (1)

$$\text{No. of moles of CO}_2 = \frac{\text{given mass}}{\text{molar mass}} = \frac{4.4}{44} = 0.1$$

$$\text{Volume of CO}_2 = \text{No. of moles} \times \text{molar volume} \\ = 0.1 \times 22.4 = 2.24 \text{ L}$$

(NEW NCERT 11<sup>th</sup> Part-I Page No. 18)

48. (1)



$$\sigma \text{ bond} + l.p. = 3 \\ \text{hybridization} = sp^2$$

(NEW NCERT 11<sup>th</sup> Part-I Page No. 121)

49. (2)

Ge and Pb belong to group 14 of the Modern Periodic Table.

(NEW NCERT 11<sup>th</sup> Part-I Page No. 79)

50. (3)

Average oxidation no. of sulphur	Molecule/Compound
+6	H <sub>2</sub> S <sub>2</sub> O <sub>7</sub>
+2.5	Na <sub>2</sub> S <sub>4</sub> O <sub>6</sub>
+2	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>
0	S <sub>8</sub>

(NEW NCERT 11<sup>th</sup> Part-II Page No. 240)

51. (1)

$$\Delta S_{\text{vap}} = \frac{\Delta H_{\text{vap}}}{T} = \frac{41 \times 10^3}{373} \approx 110 \text{ J K}^{-1} \text{ mol}^{-1}$$

(NEW NCERT 11<sup>th</sup> Part-I Page No. 161)

52. (2)

HCl : Strong acid (pH < 7)

NH<sub>4</sub>Cl : Salt of weak base (NH<sub>4</sub>OH) and strong acid (HCl), pH < 7

NaCl : Salt of strong acid and strong base, pH = 7

NaCN : Salt of strong base and weak acid, pH > 7

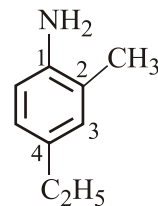
(NEW NCERT 11<sup>th</sup> Part-I Page No. 202)

53. (3)

Most of the halides (MX<sub>4</sub>) of group 14 elements are covalent in nature, whereas SnF<sub>4</sub> and PbF<sub>4</sub> are ionic in nature.

(OLD NCERT 11<sup>th</sup> Part-I Page No. 316)

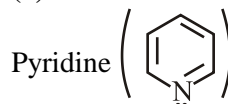
54. (1)



4-Ethyl-2-methylaniline

(NEW NCERT 11<sup>th</sup> Part-II Page No. 269)

55. (1)



Pyridine is aromatic in nature because it is cyclic, planar, conjugated and follows  $(4n + 2)\pi e^-$  rule.

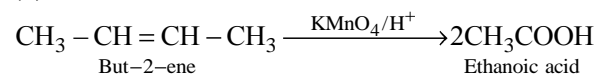
(NEW NCERT 11<sup>th</sup> Part-II Page No. 321)

56. (2)

CH<sub>3</sub>-CH=CH<sub>2</sub> does not show geometrical isomerism as two same H-atoms are connected to a double bonded carbon.

(NEW NCERT 11<sup>th</sup> Part-II Page No. 308)

57. (4)

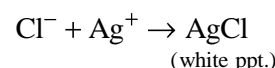


(NEW NCERT 11<sup>th</sup> Part-II Page No. 313)

58. (3)

### Test of Halogens

The sodium fusion extract is acidified with nitric acid and then treated with silver nitrate. A white precipitate, soluble in ammonium hydroxide shows the presence of chlorine.



(NEW NCERT 11<sup>th</sup> Part-II Page No. 285)

59. (1)

- In photoelectric effect, the kinetic energy of photoelectrons increases linearly with the frequency of incident light.
- Threshold frequency is a characteristic minimum frequency for each metal, below which the photoelectric effect is not seen.

(NEW NCERT 11<sup>th</sup> Part-I Page No. 41)

60. (3)

- No. of molecules in 3.6 g of H<sub>2</sub>O  

$$= \frac{3.6}{18} \times N_A = 0.2N_A$$

- No. of molecules in 1.8 moles of H<sub>2</sub>O  

$$= 1.8 \times N_A = 1.8N_A$$

- No. of molecules in 36g of H<sub>2</sub>O  

$$= \frac{36}{18} \times N_A = 2N_A$$

- No. of molecules in 0.36 moles of H<sub>2</sub>O  

$$= 0.36 \times N_A = 0.36N_A$$

(NEW NCERT 11<sup>th</sup> Part-I Page No. 18)

61. (2)  
Element with the highest electron affinity is Cl and it belongs to period 3 and group 17 of the Modern Periodic Table.  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 89)

62. (3)  
Adiabatic process - No exchange of heat (q) between system and surrounding  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 138)

63. (4)
- | Compound          | Shape              |
|-------------------|--------------------|
| H <sub>2</sub> O  | Bent               |
| XeCl <sub>4</sub> | Square planar      |
| SF <sub>4</sub>   | See-Saw            |
| NH <sub>3</sub>   | Trigonal pyramidal |
- (NEW NCERT 11<sup>th</sup> Part-I Page No. 116)

64. (4)  
The melting point of Ga is around 303K and therefore it could exist in liquid state during summers.  
(OLD NCERT 11<sup>th</sup> Part-I Page No. 310)

65. (1)  
$$K_p = \frac{(P_{AO})^2}{(P_{AO_2})} = \frac{(4)^2}{8} = 2 \text{ atm}$$
  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 178)

66. (4)
- reduction

oxidation
- (NEW NCERT 11<sup>th</sup> Part-II Page No. 236)

67. (3)  
Decreasing order of first ionization enthalpy is:  
C > Be > B  
In Be, the electron removed during the ionization is an s-electron whereas the electron removed during ionization of B is a p-electron. The penetration of a 2s-electron to the nucleus is more than that of a 2p-electron; hence the 2p electron of B is more shielded from the nucleus by the inner core of electron than the 2s electrons of Be. Therefore, it is easier to remove, the 2p-electron from B compared to the removal of a 2s-electron from Be. Thus, B has a smaller first ionization enthalpy than Be.  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 88)

68. (4)
- 4-Ethyl-3,3-dimethyloctane
- (NEW NCERT 11<sup>th</sup> Part-II Page No. 263)

69. (3)  
Hyperconjugation effect is also known as no bond resonance.  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 277)

70. (3)
- $$\text{HC} \equiv \text{CH} + \text{H}_2\text{O} \xrightarrow[333\text{K}]{\text{Hg}^{2+}/\text{H}^+} \text{CH}_3\text{CHO}$$
- $$\text{HC} \equiv \text{CH} + 2\text{H}_2 \xrightarrow{\Delta}{\text{Pt}} \text{CH}_3\text{CH}_3$$
- $$\text{Br}-\text{CH}_2-\text{CH}_2-\text{Br} \xrightarrow[\text{ii) NaNH}_2]{\text{i) alc. KOH, } \Delta} \text{CH} \equiv \text{CH}$$
- $$\text{CH}_3\text{CH}_2\text{OH} \xrightarrow[\Delta]{\text{Conc. H}_2\text{SO}_4} \text{CH}_2 = \text{CH}_2 + \text{H}_2\text{O}$$
- (NEW NCERT 11<sup>th</sup> Part-II Page No. 317)

71. (3)  
In case, nitrogen and sulphur both are present in an organic compound, sodium thiocyanate is formed. It gives blood red colour and no Prussian blue since there are no free cyanide ions.  
 $\text{Na} + \text{C} + \text{N} + \text{S} \rightarrow \text{NaSCN}$   
 $\text{Fe}^{3+} + \text{SCN}^- \rightarrow [\text{Fe}(\text{SCN})]^{2+}$   
Blood red  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 285)

72. (4)  
 $\text{Zn(s)} + \text{Cu(NO}_3)_2\text{(aq)} \rightarrow \text{Zn(NO}_3)_2\text{(aq)} + \text{Cu(s)}$   
Blue Colourless  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 238)

73. (2)
- | <i>l</i> | Orbital | Shape           |
|----------|---------|-----------------|
| 0        | s       | spherical       |
| 1        | p       | dumbbell        |
| 2        | d       | Double dumbbell |
| 3        | f       | Complex         |
- (NEW NCERT 11<sup>th</sup> Part-I Page No. 58)

74. (1)  
$$\text{Molarity} = \frac{10 \times \text{Mass\%} \times \text{density}}{M_{\text{solute}}}$$
  
$$= \frac{10 \times 98 \times 2}{98} = 20 \text{ M}$$
  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 23)

75. (3)  
Among isoelectronic species, the one with the larger nuclear charge will have a smaller radius because of the greater attraction of the electrons to the nucleus.  
Increasing order of ionic radii:  $\text{Al}^{3+} < \text{Mg}^{2+} < \text{Na}^+ < \text{F}^-$   
(NEW NCERT 11<sup>th</sup> Part-I Page No. 87)

76. (1)
- O = C = O
- The two equal bond dipoles in CO<sub>2</sub> point in opposite directions and cancel the effect of each other. ∴ The dipole moment is zero.  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 111)

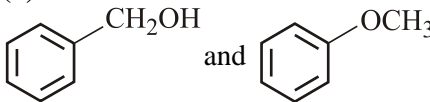



77. (3)  
In expansion of gas at constant temperature,  
 $\Delta S > 0$ ;  $\Delta S = +ve$   
Sublimation of solid  $I_2$  into vapours,  $\Delta S = +ve$   
Condensation of water,  $\Delta S = -ve$   
 $2H(g) \rightarrow H_2(g)$ ,  $\Delta S < 0$  ( $\because \Delta n_g < 0$ )  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 158)

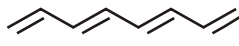
78. (2)  
$$\overset{0}{Ca}(s) + 2\overset{+1}{H}\overset{-2}{O}(l) \rightarrow \overset{+2}{Ca}\overset{-2}{O}\overset{+1}{H}_2(aq) + \overset{0}{H}_2(g)$$
  
This is an example of non-metal displacement reaction as Ca displaces hydrogen from water.  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 243)

79. (2)  
If  $Q_C < K_C$ , the reaction will proceed in the direction of the products (forward reaction).  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 182)

80. (3)  
As we move down the group, due to poor shielding effect of intervening d and f orbitals, the increased effective nuclear charge holds ns electrons tightly and thereby, restricting their participation in bonding. As a result of this, only p-orbital electron may be involved in bonding.  $\therefore$  The relative stability of +1 oxidation state progressively increases for heavier elements.  
So the stability order is:  $Tl > In > Al$   
(OLD NCERT 11<sup>th</sup> Part-I Page No. 309)

81. (3)  
  
are functional isomers as they have same molecular formula but different functional groups.  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 270)

82. (3)  
The most stable carbocation is  due to resonance.  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 276)

83. (3)  
  
1,3,5,7-Octatetraene has 17  $\sigma$  bonds and 4  $\pi$  bonds.  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 307)

84. (4)  
$$CH_3COOH \xrightarrow{NaOH(aq)} CH_3COONa \xrightarrow[\Delta]{Soda\ lime} CH_4$$
  
(A) (B)  
$$C_2H_6 \xleftarrow[Wurtz\ reaction]{Na/dry\ ether} CH_3Cl \xleftarrow{Cl_2/h\nu}$$
  
(D) (C)  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 318)

85. (1)  
• Paper chromatography is a type of partition chromatography.  
• Thin layer chromatography is a type of adsorption chromatography.  
(NEW NCERT 11<sup>th</sup> Part-II Page No. 283)

86. (1)  
$$E = -\frac{13.6Z^2}{n^2} eV$$
  
$$\frac{E_3}{E_4} = \frac{-13.6 \times \frac{1}{9}}{-13.6 \times \frac{1}{16}}$$
  
$$\frac{E_3}{E_4} = \frac{16}{9}$$
  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 48)

87. (1)  
According to first law of thermodynamics:  
 $\Delta U = q + w$   
 $q = +200\text{ J}$ ,  $w = -400\text{ J}$   
 $\Delta U = 200 - 400 = -200\text{ J}$   
(NEW NCERT 11<sup>th</sup> Part-I Page No. 140)

88. (2)
- | Element | %   | At. mass | Moles | Simplest ratio             |
|---------|-----|----------|-------|----------------------------|
| A       | 80% | 12       | 6.6   | $\frac{6.6}{6.6} = 1$      |
| B       | 20% | 1        | 20    | $\frac{20}{6.6} \approx 3$ |
- Empirical formula  $\Rightarrow AB_3$   
(NEW NCERT 11<sup>th</sup> Part-I Page No. 19)

89. (4)
- |   | Ion        |     | Bond order |
|---|------------|-----|------------|
| A | $N_2^{2-}$ | II  | 2          |
| B | $NO^+$     | I   | 3          |
| C | $N_2^-$    | IV  | 2.5        |
| D | $O_2^{2-}$ | III | 1          |
- (NEW NCERT 11<sup>th</sup> Part-I Page No. 129)

90. (1)  
Na and K are present in the same group i.e. group 1. Hence they exhibit similar chemical behaviour due to same no. of electrons in their valence shell.  
(NEW NCERT 11<sup>th</sup> Part-I Page No. 82)

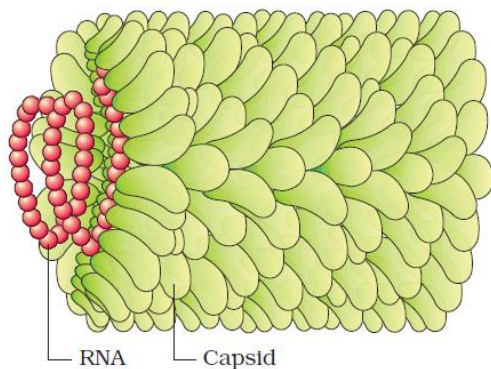
91. (1)

In Krebs' cycle, during the conversion of succinyl-CoA to succinic acid a molecule of GTP is synthesised.

(NEW NCERT 11<sup>th</sup> Page No. 159)

92. (2)

Tobacco Mosaic Virus:



(NEW NCERT 11<sup>th</sup> Page No. 20)

93. (1)

Ethylene promotes senescence and abscission of plant organs especially of leaves and flowers.

(NEW NCERT 11<sup>th</sup> Page No. 177)

94. (3)

There are three points in the TCA cycle where  $\text{NAD}^+$  is reduced to  $\text{NADH} + \text{H}^+$  and one point where  $\text{FAD}^+$  is reduced to  $\text{FADH}_2$ .

(NEW NCERT 11<sup>th</sup> Page No. 159)

95. (3)

The meristems which occur at the tips of roots and shoots and produce primary tissues are called apical meristems. The meristem which occurs between mature tissues is known as intercalary meristem. Xylem functions as a conducting tissue for water and minerals from roots to the stem and leaves. Phloem transports food materials, usually from leaves to other parts of the plant.

(OLD NCERT 11<sup>th</sup> Page No. 84, 85, 87)

96. (2)

For every  $\text{CO}_2$  molecule entering the Calvin cycle, 3 molecules of ATP and 2 of NADPH are required. It is probably to meet this difference in number of ATP and NADPH used in the dark reaction that the

cyclic phosphorylation takes place. To make one molecule of glucose 6 turns of the cycle are required. It might help you to understand all of this if we look at what goes in and what comes out of the Calvin cycle.

In	Out
Six $\text{CO}_2$	One glucose
18 ATP	18 ADP
12 NADPH	12 NADP

(NEW NCERT 11<sup>th</sup> Page No. 145)

97. (4)

Viroids : In 1971, T.O. Diener discovered a new infectious agent that was smaller than viruses and caused potato spindle tuber disease. It was found to be a free RNA; it lacked the protein coat that is found in viruses, hence the name viroid.

(NEW NCERT 11<sup>th</sup> Page No. 21)

98. (3)

Gibberellins promote bolting (internode elongation just prior to flowering) in beet, cabbages and many plants with rosette habit.

(NEW NCERT 11<sup>th</sup> Page No. 176)

99. (4)

The stomatal aperture, guard cells and the surrounding subsidiary cells are together called stomatal apparatus. In leaves, the ground tissue consists of thin-walled chloroplast containing cells and is called mesophyll.

(NEW NCERT 11<sup>th</sup> Page No. 72)

100. (4)

For aerobic respiration to take place within the mitochondria, the final product of glycolysis, pyruvate is transported from the cytoplasm into the mitochondria. The crucial events in aerobic respiration are:

- The complete oxidation of pyruvate by the stepwise removal of all the hydrogen atoms, leaving three molecules of  $\text{CO}_2$ .
- The passing on of the electrons removed as part of the hydrogen atoms to molecular  $\text{O}_2$  with simultaneous synthesis of ATP.

(NEW NCERT 11<sup>th</sup> Page No. 158)

**101. (2)**

In  $C_4$  pathway, the primary  $CO_2$  acceptor is a 3-carbon molecule phosphoenol pyruvate (PEP) and is present in the mesophyll cells. The enzyme responsible for this fixation is PEP carboxylase or PEPcase.

**(NEW NCERT 11<sup>th</sup> Page No. 146)**

**102. (1)**

In majority of animals and plants, growth and reproduction are mutually exclusive events. Mountains, boulders and sand mounds do grow.

**(OLD NCERT 11<sup>th</sup> Page No. 4)**

**103. (2)**

Diatoms are the chief 'producers' in the oceans. Very often, red dinoflagellates (Example: *Gonyaulax*) undergo such rapid multiplication that they make the sea appear red (red tides). Majority of euglenoids (Example: *Euglena*) are fresh water organisms found in stagnant water. Instead of a cell wall, they have a protein rich layer called pellicle which makes their body flexible. Slime moulds are saprophytic protists.

**(NEW NCERT 11<sup>th</sup> Page No. 14, 15)**

**104. (3)**

In the chromoplasts fat soluble carotenoid pigments like carotene, xanthophylls and others are present. This gives the part of the plant a yellow, orange or red colour. The leucoplasts are the colourless plastids of varied shapes and sizes with stored nutrients: Amyloplasts store carbohydrates (starch), e.g., potato; elaioplasts store oils and fats whereas the aleuroplasts store proteins.

**(NEW NCERT 11<sup>th</sup> Page No. 97, 98)**

**105. (2)**

Food is stored as complex carbohydrates, which may be in the form of laminarin or mannitol in brown algae.

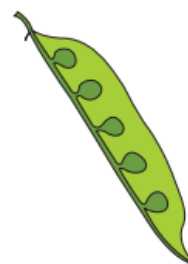
Rhodophyceae: The members of rhodophyceae are commonly called red algae because of the predominance of the red pigment, r-phycoerythrin in their body. Majority of the red algae are marine with greater concentrations found in the warmer areas. They occur in both well-lighted regions close to the surface of water and also at great depths in oceans where relatively little light penetrates. The

red algae usually reproduce vegetatively by fragmentation. They reproduce asexually by non-motile spores and sexually by non-motile gametes. The food is stored as floridean starch which is very similar to amylopectin and glycogen in structure.

**(NEW NCERT 11<sup>th</sup> Page No. 27, 28)**

**106. (1)**

In marginal placentation the placenta forms a ridge along the ventral suture of the ovary and the ovules are borne on this ridge forming two rows, as in pea.



**(NEW NCERT 11<sup>th</sup> Page No. 65)**

**107. (3)**

Organisms with their Taxonomic Categories:

Common Name	Biological Name	Genus	Family	Order	Class	Phylum/ Division
Man	<i>Homo sapiens</i>	<i>Homo</i>	Hominidae	Primata	Mammalia	Chordata
Housefly	<i>Musca domestica</i>	<i>Musca</i>	Muscidae	Diptera	Insecta	Arthropoda
Mango	<i>Mangifera indica</i>	<i>Mangifera</i>	Anacardiaceae	Sapindales	Dicotyledonae	Angiospermae
Wheat	<i>Triticum aestivum</i>	<i>Triticum</i>	Poaceae	Poales	Monocotyledonae	Angiospermae

**(NEW NCERT 11<sup>th</sup> Page No. 8)**

**108. (4)**

The leaves in pteridophyta are small (microphylls) as in *Selaginella* or large (macrophylls) as in ferns. Roots in some genera of gymnosperms have fungal association in the form of mycorrhiza (*Pinus*), while in some others (*Cycas*) small specialised roots called coralloid roots are associated with  $N_2$ -fixing cyanobacteria. The stems are unbranched (*Cycas*) or branched (*Pinus*, *Cedrus*) in gymnosperms.

**(NEW NCERT 11<sup>th</sup> Page No. 30, 32)**

**109. (1)**

The conversion of BPGA to 3-phosphoglyceric acid (PGA) in glycolysis is an energy yielding process. This energy is trapped by the formation of ATP.

**(NEW NCERT 11<sup>th</sup> Page No. 156)**

**110. (3)**

The cortex in dicot stem consists of three sub-zones. The outer hypodermis, consists of a few layers of collenchymatous cells just below the epidermis, which provide mechanical strength to the young stem. Cortical layers below hypodermis consist of rounded thin walled parenchymatous cells with conspicuous intercellular spaces. The innermost layer of the cortex is called the endodermis. The cells of the endodermis are rich in starch grains and the layer is also referred to as the starch sheath.

**(NEW NCERT 11<sup>th</sup> Page No. 75)**

**111. (4)**

Nuclear envelope develops around the chromosome clusters at each pole forming two daughter nuclei in telophase.

**(NEW NCERT 11<sup>th</sup> Page No. 124)**

**112. (1)**

The gaseous PGR, ethylene, could fit either of the groups (growth promoter and inhibitor), but it is largely an inhibitor of growth activities. ABA stimulates the closure of stomata and increases the tolerance of plants to various kinds of stresses. Therefore, it is also called the stress hormone.

**(NEW NCERT 11<sup>th</sup> Page No. 174, 177)**

**113. (4)**

A chromatographic separation of the leaf pigments shows that the colour that we see in leaves is not due to a single pigment but due to four pigments: Chlorophyll *a* (bright or blue green in the chromatogram), chlorophyll *b* (yellow green), xanthophylls (yellow) and carotenoids (yellow to yellow-orange).

**(NEW NCERT 11<sup>th</sup> Page No. 137)**

**114. (1)**

Aestivation: The mode of arrangement of sepals or petals in floral bud with respect to the other members of the same whorl is known as aestivation. The main types of aestivation are valvate, twisted, imbricate and vexillary. When sepals or petals in a whorl just touch one another at the margin, without overlapping, as in *Calotropis*,

it is said to be valvate. If one margin of the appendage overlaps that of the next one and so on as in china rose, lady's finger and cotton, it is called twisted. If the margins of sepals or petals overlap one another but not in any particular direction as in *Cassia* and gulmohur, the aestivation is called imbricate. In pea and bean flowers, there are five petals, the largest (standard) overlaps the two lateral petals (wings) which in turn overlap the two smallest anterior petals (keel); this type of aestivation is known as vexillary or papilionaceous.

**(NEW NCERT 11<sup>th</sup> Page No. 63, 64)**

**115. (3)**

In  $C_4$  plants photorespiration does not occur. This is because they have a mechanism that increases the concentration of  $CO_2$  at the enzyme site. This takes place when the  $C_4$  acid from the mesophyll is broken down in the bundle sheath cells to release  $CO_2$  – this results in increasing the intracellular concentration of  $CO_2$ . In turn, this ensures that the RuBisCO functions as a carboxylase minimising the oxygenase activity.

**(NEW NCERT 11<sup>th</sup> Page No. 147)**

**116. (4)**

The metacentric chromosome has middle centromere forming two equal arms of the chromosome. The sub-metacentric chromosome has centromere slightly away from the middle of the chromosome resulting into one shorter arm and one longer arm. In case of acrocentric chromosome the centromere is situated close to its end forming one extremely short and one very long arm, whereas the telocentric chromosome has a terminal centromere.

**(NEW NCERT 11<sup>th</sup> Page No. 101)**

**117. (1)**

In multicellular organisms, reproduction refers to the production of progeny possessing features more or less similar to those of parents. Invariably and implicitly we refer to sexual reproduction. Organisms reproduce by asexual means also. Fungi multiply and spread easily due to the millions of asexual spores they produce. In lower organisms

like yeast and hydra, we observe budding. In *Planaria* (flat worms), we observe true regeneration, i.e., a fragmented organism regenerates the lost part of its body and becomes a new organism. Further, there are many organisms which do not reproduce (mules, sterile worker bees, infertile human couples, etc).

**(OLD NCERT 11<sup>th</sup> Page No. 4)**

**118. (2)**

During the G<sub>2</sub> phase, proteins are synthesised in preparation for mitosis while cell growth continues.

**(NEW NCERT 11<sup>th</sup> Page No. 121)**

**119. (4)**

Yeasts poison themselves to death when the concentration of alcohol reaches about 13 per cent.

**(NEW NCERT 11<sup>th</sup> Page No. 157)**

**120. (1)**

The C<sub>3</sub> and C<sub>4</sub> plants respond differently to CO<sub>2</sub> concentrations. At low light conditions neither group responds to high CO<sub>2</sub> conditions. At high light intensities, both C<sub>3</sub> and C<sub>4</sub> plants show increase in the rates of photosynthesis. What is important to note is that the C<sub>4</sub> plants show saturation at about 360 μL<sup>-1</sup> while C<sub>3</sub> responds to increased CO<sub>2</sub> concentration and saturation is seen only beyond 450 μL<sup>-1</sup>. Thus, current availability of CO<sub>2</sub> levels is limiting to the C<sub>3</sub> plants.

**(NEW NCERT 11<sup>th</sup> Page No. 150)**

**121. (2)**

Many membrane bound minute vesicles called microbodies that contain various enzymes, are present in both plant and animal cells.

**(NEW NCERT 11<sup>th</sup> Page No. 102)**

**122. (2)**

Auxins (from Greek 'auxein' : to grow) was first isolated from human urine.

**(NEW NCERT 11<sup>th</sup> Page No. 175)**

**123. (2)**

Common examples of mosses are *Funaria*, *Polytrichum* and *Sphagnum*.

**(NEW NCERT 11<sup>th</sup> Page No. 30)**

**124. (2)**

Gynoecium is the female reproductive part of the flower and is made up of one or more carpels. A carpel consists of three parts namely stigma, style and ovary. Ovary is the enlarged basal part, on which lies the elongated tube, the style. The style connects the ovary to the stigma. The stigma is usually at the tip of the style and is the receptive surface for pollen grains. Each ovary bears one or more ovules attached to a flattened, cushion-like placenta. After fertilisation, the ovules develop into seeds and the ovary matures into a fruit.

**(NEW NCERT 11<sup>th</sup> Page No. 65)**

**125. (1)**

The cells of epidermis bear a number of hairs. The root hairs are unicellular elongations of the epidermal cells and help absorb water and minerals from the soil. On the stem the epidermal hairs are called trichomes. The trichomes in the shoot system are usually multicellular. They may be branched or unbranched and soft or stiff. They may even be secretory. The trichomes help in preventing water loss due to transpiration.

**(NEW NCERT 11<sup>th</sup> Page No. 72)**

**126. (3)**

*Sporozoans*: This includes diverse organisms that have an infectious spore-like stage in their life cycle.

**(NEW NCERT 11<sup>th</sup> Page No. 16)**

**127. (2)**

The hilum is a scar on the seed coat through which the developing seeds are attached to the fruit in dicot plants.

**(NEW NCERT 11<sup>th</sup> Page No. 66)**

**128. (2)**

Reduction step of Calvin cycle – These are a series of reactions that lead to the formation of glucose. The steps involve utilisation of 2 molecules of ATP for phosphorylation and two of NADPH for reduction per CO<sub>2</sub> molecule fixed. The fixation of six molecules of CO<sub>2</sub> and 6 turns of the cycle are required for the formation of one molecule of glucose from the pathway.

**(NEW NCERT 11<sup>th</sup> Page No. 144)**

**129. (3)**

The metabolic pathway through which the electron passes from one carrier to another, is called the *electron transport system* (ETS) and it is present in the inner mitochondrial membrane. Electrons from NADH produced in the mitochondrial matrix during citric acid cycle are oxidised by an NADH dehydrogenase (complex I), and electrons are then transferred to ubiquinone located within the inner membrane. Ubiquinone also receives reducing equivalents via  $\text{FADH}_2$  (complex II) that is generated during oxidation of succinate in the citric acid cycle. The reduced ubiquinone (ubiquinol) is then oxidised with the transfer of electrons to cytochrome *c* via cytochrome  $bc_1$  complex (complex III). Cytochrome *c* is a small protein attached to the outer surface of the inner membrane and acts as a mobile carrier for transfer of electrons between complex III and IV. Complex IV refers to cytochrome *c* oxidase complex containing cytochromes *a* and  $a_3$ , and two copper centres.

**(NEW NCERT 11<sup>th</sup> Page No. 159, 160)**

**130. (3)**

The plant growth regulators (PGRs) are small, simple molecules of diverse chemical composition. They could be indole compounds (indole-3-acetic acid, IAA); adenine derivatives ( $\text{N}^6$ -furfurylamino purine, kinetin), derivatives of carotenoids (abscisic acid, ABA); terpenes (gibberellic acid,  $\text{GA}_3$ ) or gases (ethylene,  $\text{C}_2\text{H}_4$ ).

**(NEW NCERT 11<sup>th</sup> Page No. 174)**

**131. (3)**

Cell growth results in disturbing the ratio between the nucleus and the cytoplasm. It therefore becomes essential for the cell to divide to restore the nucleo-cytoplasmic ratio.

**(NEW NCERT 11<sup>th</sup> Page No. 125)**

**132. (2)**

The compound leaves may be of two types. In a pinnately compound leaf a number of leaflets are

present on a common axis, the rachis, which represents the midrib of the leaf as in neem. In palmately compound leaves, the leaflets are attached at a common point, i.e., at the tip of petiole, as in silk cotton. In alternate type of phyllotaxy, a single leaf arises at each node in alternate manner, as in china rose, mustard and sun flower plants. In opposite type, a pair of leaves arise at each node and lie opposite to each other as in *Calotropis* and guava plants. If more than two leaves arise at a node and form a whorl, it is called whorled, as in *Alstonia*.

**(NEW NCERT 11<sup>th</sup> Page No. 60, 61)**

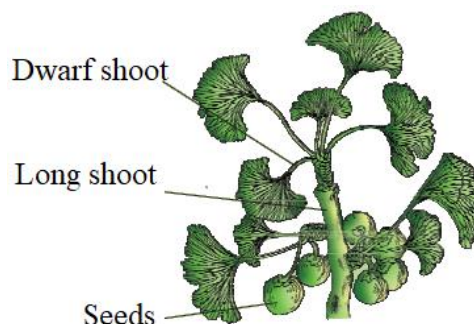
**133. (3)**

Auxins also induce parthenocarp, e.g., in tomatoes. They are widely used as herbicides.

**(NEW NCERT 11<sup>th</sup> Page No. 176)**

**134. (1)**

The given diagram represents the structure of *Ginkgo*, a gymnosperm.



**(NEW NCERT 11<sup>th</sup> Page No. 33)**

**135. (2)**

Deuteromycetes: Commonly known as imperfect fungi because only the asexual or vegetative phases of these fungi are known. The deuteromycetes reproduce only by asexual spores known as conidia. The mycelium is septate and branched. Some members are saprophytes or parasites while a large number of them are decomposers of litter and help in mineral cycling. Some examples are *Alternaria*, *Colletotrichum* and *Trichoderma*.

**(NEW NCERT 11<sup>th</sup> Page No. 18)**



**136. (1)**

Columnar epithelium is present in the lining of intestine which has microvilli on its free surface. Microvilli are tiny, finger-like projections on the surface of columnar epithelial cells which significantly increase the surface area available for absorption, allowing more efficient reabsorption of nutrients from the digestive tract into the bloodstream.

**(OLD NCERT 11<sup>th</sup> Page No. 101, 103, 104)**

**137. (4)**

Cofactors are non-protein components required by enzymes for their activity. They can be prosthetic groups (e.g., Haem in haemoglobin or cytochromes), coenzymes (e.g.,  $\text{NAD}^+$  as a carrier of electrons in redox reactions) and metal ions (e.g.,  $\text{Zn}^{2+}$  in carboxypeptidase). Malonate, on the other hand, is not a cofactor. Instead, it acts as a competitive inhibitor of the enzyme succinate dehydrogenase by mimicking the structure of succinate, a substrate in the citric acid cycle.

**(NEW NCERT 11<sup>th</sup> Page No. 117, 118)**

**138. (3)**

External ears or pinnae are unique to mammals among vertebrates. They serve the function of collecting and directing sound waves toward the inner ear, aiding in hearing. Reptiles, amphibians, and other vertebrates lack external ears and rely on other structures or mechanisms for sound detection.

**(NEW NCERT 11<sup>th</sup> Page No. 51)**

**139. (3)**

Rh antigen is found on the surface of RBCs, not WBCs. Rh-positive individuals have Rh antigens, while Rh-negative individuals lack them and can form antibodies if exposed to Rh-positive blood. Rh incompatibility is a significant concern during pregnancy and can lead to *erythroblastosis foetalis* in subsequent pregnancies.

**(NEW NCERT 11<sup>th</sup> Page No. 196)**

**140. (2)**

List-I	List-II
Tidal Volume (TV)	Volume of air inspired or expired during normal respiration
Inspiratory Reserve Volume (IRV)	Additional volume of air, a person can inspire by a forcible inspiration.
Functional Residual Capacity (FRC)	Volume of air that will remain in the lungs after a normal expiration
Vital Capacity (VC)	The maximum volume of air a person can breathe in after a forced expiration

**(NEW NCERT 11<sup>th</sup> Page No. 186, 187)**

**141. (2)**

The neural system of all animals is composed of highly specialised cells called neurons which can detect, receive and transmit different kinds of stimuli. The neural organisation is very simple in lower invertebrates. For example, in *Hydra* it is composed of a network of neurons.

**(NEW NCERT 11<sup>th</sup> Page No. 231)**

**142. (1)**

Proximal Convoluted Tubule (PCT) is lined by simple cuboidal brush border epithelium which increases the surface area for reabsorption. Nearly all of the essential nutrients, and 70-80 per cent of electrolytes and water are reabsorbed by this segment. PCT also helps to maintain the pH and ionic balance of the body fluids by selective secretion of hydrogen ions and ammonia into the filtrate and by absorption of  $\text{HCO}_3^-$  from it.

**(NEW NCERT 11<sup>th</sup> Page No. 209)**

**143. (3)**

Glycogenolysis is the process in which glycogen, a stored form of glucose in the liver and muscles, is broken down into glucose molecules. This process helps maintain blood glucose levels, especially when the body needs energy between meals or during physical activity.

**(NEW NCERT 11<sup>th</sup> Page No. 245, 246)**

**144. (4)**

Thyroid hormones play an important role in the regulation of the basal metabolic rate. These hormones also support the process of red blood cell formation. Thyroid hormones control the metabolism of carbohydrates, proteins and fats. Maintenance of water and electrolyte balance is also influenced by thyroid hormones. Thyroid hormones do not play major role in regulation of blood glucose levels which is primarily the functions of insulin and glucagon hormones.

**(NEW NCERT 11<sup>th</sup> Page No. 243)**

**145. (3)**

White muscle fibres possess very less quantity of myoglobin and therefore, appear pale or whitish. Number of mitochondria are also few in them, but the amount of sarcoplasmic reticulum is high. They depend on anaerobic process for energy.

**(NEW NCERT 11<sup>th</sup> Page No. 223)**

146. (4)

List-I	List-II
Exocrine glands	Secrete substances through ducts
Endocrine glands	Secrete hormones directly into the bloodstream
Goblet cells	Produce and release mucus
Salivary gland	Cluster of multicellular glands

(OLD NCERT 11<sup>th</sup> Page No. 102)

147. (3)

Amino acids are organic compounds containing an amino group and an acidic group as substituents on the same carbon i.e., the  $\alpha$ -carbon. Hence, they are called  $\alpha$ -amino acids. They are substituted methanes not propanes. Based on the nature of R group there are many amino acids. However, those which occur in proteins are only of twenty types. Tyrosine is an aromatic amino acid.

(NEW NCERT 11<sup>th</sup> Page No. 105, 106)

148. (3)

List-I	List-II
<i>Bufo</i>	Toad
<i>Hyla</i>	Tree frog
<i>Salamandra</i>	Salamander
<i>Ichthyophis</i>	Limbless amphibia

(NEW NCERT 11<sup>th</sup> Page No. 48)

149. (2)

In tissues, conditions like low  $pO_2$ , high  $pCO_2$ , high  $H^+$  concentration, and higher temperature promote the dissociation of oxygen from oxyhemoglobin, allowing oxygen to be released and utilized by tissues.

(NEW NCERT 11<sup>th</sup> Page No. 189)

150. (1)

Persons with blood group O do not have A or B antigens on the surface of their RBCs therefore, they are called universal donors. As a result, O blood can be donated to individuals with any ABO blood group without causing an immune reaction. However, they can only receive blood from other O group individuals.

(NEW NCERT 11<sup>th</sup> Page No. 195)

151. (3)

The proximity between the Henle's loop and vasa recta, as well as the counter current in them help in maintaining an increasing osmolarity (not decreasing) towards the inner medullary interstitium, i.e., from  $300 \text{ mOsmolL}^{-1}$  in the cortex to about  $1200 \text{ mOsmolL}^{-1}$  in the inner medulla. This gradient is mainly caused by NaCl and urea. NaCl

is transported by the ascending limb of Henle's loop (not descending) which is exchanged with the descending limb (not ascending) of vasa recta.

(NEW NCERT 11<sup>th</sup> Page No. 210, 211)

152. (3)

The first seven pairs of ribs are called true ribs because dorsally, they are attached to the thoracic vertebrae and ventrally connected to the sternum with the help of hyaline cartilage. This direct connection provides structural support to the thoracic cavity.

(NEW NCERT 11<sup>th</sup> Page No. 225)

153. (4)

The somatic neural system is responsible for relaying impulses from the central nervous system (CNS) to skeletal muscles, enabling voluntary movements. It consists of motor neurons that directly innervate muscle fibers. Unlike the autonomic system, it does not control involuntary actions.

(NEW NCERT 11<sup>th</sup> Page No. 231)

154. (1)

In females, anal styles and the mushroom-shaped gland are absent. However, anal cerci are present in both sexes, and the collateral glands are specific to females, aiding in ootheca formation.

(OLD NCERT 11<sup>th</sup> Page No. 114, 115)

155. (4)

List-I (Element)	List-II (%age weight of human body)
Hydrogen	0.5
Carbon	18.5
Oxygen	65.0
Nitrogen	3.3

(NEW NCERT 11<sup>th</sup> Page No. 105)

156. (4)

*Pleurobrachia* belongs to the phylum *Ctenophora*, which lacks cnidoblasts. Cnidoblasts are specialized stinging cells found in Cnidaria, such as jellyfish and *Hydra*.

(NEW NCERT 11<sup>th</sup> Page No. 41, 42)

157. (1)

The pericardium is a double-walled protective membrane that encloses the heart and contains pericardial fluid to reduce friction during heartbeats. The myocardium refers to the muscular wall of the heart, pleura surrounds the lungs, and peritoneum lines the abdominal cavity.

(NEW NCERT 11<sup>th</sup> Page No. 198, 199)



**158. (2)**

Urine is stored in the urinary bladder till a voluntary signal from CNS (not involuntary) carries out its release through urethra. The process of release of urine is called micturition and the neural mechanisms causing it is called the micturition reflex.

**(NEW NCERT 11<sup>th</sup> Page No. 212, 213)**

**159. (3)**

Dendrites are the branched extensions of a neuron that receive signals from other neurons or sensory receptors and transmit these impulses towards the cell body. In contrast, the axon transmits impulses away from the cell body. Synaptic knobs are involved in transmitting signals to the next neuron or effector, while the myelin sheath provides insulation to the axon.

**(NEW NCERT 11<sup>th</sup> Page No. 231, 232)**

**160. (2)**

A specialised centre present in the medulla region of the brain called respiratory rhythm centre is primarily responsible for regulation of respiration in human body.

**(NEW NCERT 11<sup>th</sup> Page No. 190)**

**161. (1)**

List-I	List-II
Tunica externa	The outermost layer of blood vessels made of connective tissue
Tunica media	The middle layer composed of smooth muscles and elastic fibers
Tunica interna	The innermost layer lining the lumen of blood vessels, made of endothelium
Hepatic portal system	Carry blood from the gastrointestinal tract to the liver

**(NEW NCERT 11<sup>th</sup> Page No. 201)**

**162. (4)**

Osteoporosis is an age-related disorder characterised by decreased bone mass and increased chances of fractures. Decreased levels of estrogen is a common cause.

**(NEW NCERT 11<sup>th</sup> Page No. 227)**

**163. (3)**

Neurotransmitters are released from synaptic vesicles in the axon terminal of the pre-synaptic neuron. They bind to specific receptors on the post-synaptic membrane, opening ion channels that lead to the generation of a new potential in the post-synaptic neuron.

**(NEW NCERT 11<sup>th</sup> Page No. 234, 235)**

**164. (4)**

List-I	List-II
Tight junctions	Prevents substance leakage across tissues
Adhering junctions	Cementing to hold cells together
Gap junctions	Rapid transfer of ions and molecules
Matrix in connective tissues	Provides strength and elasticity

**(OLD NCERT 11<sup>th</sup> Page No. 102, 103)**

**165. (2)**

Annelids (such as earthworms) do have longitudinal and circular muscles which help in locomotion, not in excretion. These muscles enable the annelids to contract and extend their bodies for movement, helping them burrow into the soil or swim. Excretion is mainly carried out by specialized structures called nephridia.

**(NEW NCERT 11<sup>th</sup> Page No. 43)**

**166. (3)**

Oils have a lower melting point compared to fats and hence remain in a liquid state even during winters, unlike fats, which solidify at lower temperatures.

**(NEW NCERT 11<sup>th</sup> Page No. 106)**

**167. (2)**

Ammonotelic animals excrete ammonia as their primary nitrogenous waste, which is highly toxic and requires large amounts of water for excretion. Tadpoles of frogs, being aquatic, are ammonotelic. Adult frogs, however, are ureotelic as they excrete urea. Cockroaches and land snails are uricotelic, excreting uric acid to conserve water.

**(NEW NCERT 11<sup>th</sup> Page No. 205)**

**168. (3)**

Each haemoglobin molecule can carry a maximum of four molecules of O<sub>2</sub>. Binding of oxygen with haemoglobin is primarily related to partial pressure of O<sub>2</sub>. Partial pressure of CO<sub>2</sub>, hydrogen ion concentration and temperature are the other factors which can interfere with this binding.

**(NEW NCERT 11<sup>th</sup> Page No. 189)**

**169. (2)**

Parathyroid hormone (PTH) increases the Ca<sup>2+</sup> levels in the blood. PTH acts on bones and stimulates the process of bone resorption (dissolution/ demineralisation). PTH also stimulates reabsorption of Ca<sup>2+</sup> by the renal tubules and increases Ca<sup>2+</sup> absorption from the digested food.

**(NEW NCERT 11<sup>th</sup> Page No. 243)**

**170. (3)**

Underproduction of hormones by the adrenal cortex alters carbohydrate metabolism causing acute weakness and fatigue leading to a disease called Addison's disease.

The adrenal medulla secretes two hormones called adrenaline or epinephrine and noradrenaline or norepinephrine. These are commonly called as catecholamines.

**(NEW NCERT 11<sup>th</sup> Page No. 244)**

**171. (2)**

Anterior end of the head bears appendages forming biting and chewing type of mouth parts, not piercing and sucking type. Forewings (mesothoracic) called tegmina are opaque dark and leathery and cover the hind wings when at rest. The hind wings are transparent, membranous and are used in flight.

**(OLD NCERT 11<sup>th</sup> Page No. 112)**

**172. (2)**

List-I	List-II
Guanine	Purine
Cytosine	Pyrimidine
Uridine	Nucleoside
Adenylic acid	Nucleotide

**(NEW NCERT 11<sup>th</sup> Page No. 106, 107)**

**173. (2)**

Stroke volume refers to the amount of blood pumped out by each ventricle of the heart in a single contraction. It is an essential component in calculating cardiac output, which is the total volume of blood pumped by the heart per minute.

**(NEW NCERT 11<sup>th</sup> Page No. 200)**

**174. (4)**

The hypothalamus contains a number of centres which control body temperature, urge for eating and drinking. It also contains several groups of neurosecretory cells, which secrete hormones called hypothalamic hormones.

**(NEW NCERT 11<sup>th</sup> Page No. 236)**

**175. (2)**

List-I	List-II
Columns of Bertini	Extensions of the cortex between renal pyramids
Bowman's capsule	Cup-shaped structure surrounding the glomerulus
Henle's loop	U-shaped segment of nephron tubule
Vasa recta	Minute vessels of peritubular capillary network which runs parallel to the Henle's loop

**(NEW NCERT 11<sup>th</sup> Page No. 207, 208)**

**176. (2)**

Fibrous joints do not allow any movement. This type of joint is shown by the flat skull bones which fuse end-to-end with the help of dense fibrous connective tissues in the form of sutures, to form the cranium.

**(NEW NCERT 11<sup>th</sup> Page No. 227)**

**177. (3)**

List-I	List-II
Chondrichthyes	<i>Carcharodon</i>
Osteichthyes	<i>Pterophyllum</i>
Mammals	<i>Delphinus</i>
Aves	<i>Aptenodytes</i>

**(NEW NCERT 11<sup>th</sup> Page No. 48, 51, 50)**

**178. (2)**

The solubility of CO<sub>2</sub> is 20-25 times higher than that of O<sub>2</sub>, which means that CO<sub>2</sub> can diffuse more easily through the alveolar membrane compared to O<sub>2</sub>, even though the partial pressure of CO<sub>2</sub> is lower. This increased solubility facilitates its movement across the diffusion membrane more efficiently.

**(NEW NCERT 11<sup>th</sup> Page No. 188)**

**179. (3)**

The animal shown in the figure is prawn. In prawns (and other crustaceans), the excretory organs are called green glands (also known as antennal glands). These glands help in the excretion of waste products and osmoregulation.

**(NEW NCERT 11<sup>th</sup> Page No. 44)**

**180. (2)**

After catalysis, the enzyme releases the product and remains unchanged, ready to bind to another substrate and initiate another catalytic cycle.

**(NEW NCERT 11<sup>th</sup> Page No. 116)**

