



Aakash

Medical | IIT-JEE | Foundations

Corporate Office : AESL, 3rd Floor, Incuspaze Campus-2, Plot-13, Sector-18, Udyog Vihar, Gurugram, Haryana-122018

MOCK TEST for NEET-2025

MM : 720

Test - I

Time : 3 Hrs. 20 Mins.

Answers

1. (3)	41. (3)	81. (1)	121. (1)	161. (2)
2. (3)	42. (2)	82. (1)	122. (2)	162. (3)
3. (1)	43. (4)	83. (3)	123. (2)	163. (4)
4. (2)	44. (3)	84. (4)	124. (1)	164. (2)
5. (2)	45. (1)	85. (4)	125. (3)	165. (4)
6. (4)	46. (2)	86. (3)	126. (3)	166. (2)
7. (3)	47. (4)	87. (3)	127. (1)	167. (1)
8. (1)	48. (1)	88. (4)	128. (4)	168. (3)
9. (1)	49. (4)	89. (2)	129. (2)	169. (2)
10. (2)	50. (3)	90. (2)	130. (4)	170. (1)
11. (4)	51. (2)	91. (2)	131. (4)	171. (2)
12. (1)	52. (4)	92. (4)	132. (4)	172. (3)
13. (2)	53. (3)	93. (4)	133. (3)	173. (4)
14. (2)	54. (3)	94. (4)	134. (1)	174. (3)
15. (1)	55. (1)	95. (3)	135. (3)	175. (3)
16. (1)	56. (4)	96. (4)	136. (3)	176. (4)
17. (4)	57. (3)	97. (2)	137. (4)	177. (2)
18. (3)	58. (4)	98. (3)	138. (2)	178. (1)
19. (4)	59. (4)	99. (2)	139. (4)	179. (1)
20. (1)	60. (4)	100. (2)	140. (3)	180. (1)
21. (2)	61. (2)	101. (3)	141. (3)	181. (1)
22. (4)	62. (2)	102. (2)	142. (1)	182. (2)
23. (4)	63. (1)	103. (4)	143. (2)	183. (2)
24. (3)	64. (3)	104. (3)	144. (2)	184. (1)
25. (4)	65. (2)	105. (4)	145. (3)	185. (4)
26. (3)	66. (4)	106. (3)	146. (3)	186. (2)
27. (1)	67. (1)	107. (2)	147. (1)	187. (1)
28. (2)	68. (1)	108. (1)	148. (3)	188. (3)
29. (4)	69. (3)	109. (2)	149. (3)	189. (3)
30. (3)	70. (2)	110. (4)	150. (3)	190. (1)
31. (2)	71. (4)	111. (1)	151. (1)	191. (4)
32. (4)	72. (4)	112. (2)	152. (4)	192. (1)
33. (1)	73. (3)	113. (4)	153. (1)	193. (2)
34. (1)	74. (2)	114. (3)	154. (3)	194. (3)
35. (3)	75. (1)	115. (3)	155. (1)	195. (3)
36. (4)	76. (3)	116. (3)	156. (3)	196. (3)
37. (1)	77. (2)	117. (3)	157. (2)	197. (3)
38. (4)	78. (4)	118. (4)	158. (3)	198. (4)
39. (3)	79. (1)	119. (4)	159. (2)	199. (3)
40. (3)	80. (4)	120. (2)	160. (3)	200. (1)

14/01/2025

CODE-B



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Answers & Solutions

PHYSICS

SECTION-A

1. Answer (3)

$$|\vec{v}_{\text{inst}}| = v$$

Hence, the ratio is always equal to 1.

2. Answer (3)

Using first law of thermodynamics:

$$Q = \Delta U + W$$

$$120 = \Delta U + 70$$

$$\Delta U = 50 \text{ J}$$

3. Answer (1)

$$F = \frac{3}{x^2}$$

$$\text{Work done} = \int F dx$$

$$W = \int_1^3 \frac{3}{x^2} dx = 3 \left(\frac{x^{-2+1}}{-2+1} \right)_1^3$$

$$W = \frac{3}{-1} \left(\frac{1}{3} - \frac{1}{1} \right) = 2 \text{ J}$$

4. Answer (2)

According to the equation of continuity

$$\text{speed} \propto \frac{1}{\text{Area of cross-section}}$$

Hence, at the point of smallest cross-section, the speed will be maximum

According to Bernoulli's theorem :

$$P + \rho gh + \frac{1}{2} \rho v^2 = \text{constant}$$

Higher velocity will result in reduction of pressure, hence at the point of maximum speed, pressure will be minimum for the horizontal tube.

5. Answer (2)

Net force on q should be zero,

$$\therefore, F_1 + F_2 = 0$$

$$\frac{k(2q \times q)}{2^2} + \frac{k(Q \times q)}{1^2} = 0$$

$$\frac{q}{2} + Q = 0 \Rightarrow Q = \frac{-q}{2}$$

6. Answer (4)

$$\text{Capacitance in air} = \frac{A\epsilon_0}{d} = 80 \quad \dots(i)$$

$$\text{Capacitance in oil} = \frac{A\epsilon_0 k}{d} = 140 \quad \dots(ii)$$

$$\frac{(i)}{(ii)} \Rightarrow \frac{1}{k} = \frac{80}{140}$$

$$k = \frac{7}{4} = 1.75$$

7. Answer (3)

$$V_{\text{Source}}^2 = V_{\text{resistance}}^2 + V_{\text{inductor}}^2$$

$$20^2 = 12^2 + V^2 \quad [V_{\text{inductor}} = V]$$

$$V = 16 \text{ volt}$$

8. Answer (1)

After the collision, block A will come to rest and block P will get its kinetic energy. Since, there is no external force on (P + Q) block system after the collision, hence their COM will keep moving along +x axis.

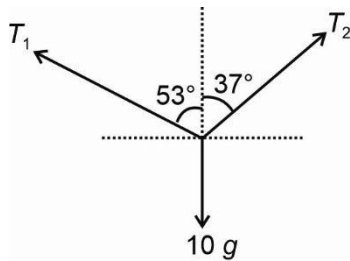
9. Answer (1)

Focal length of a lens is given by

$$\frac{1}{f} = (\mu - 1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$$

and μ depends on of wavelength of light used. Hence, reason explains the assertion.

10. Answer (2)



$$T_1 \cos 53^\circ + T_2 \cos 37^\circ = 10 \text{ g}$$

$$T_1 \times \frac{3}{5} + T_2 \times \frac{4}{5} = 10 \times 10 \quad \dots(i)$$

$$\text{Also, } T_1 \sin 53^\circ = T_2 \sin 37^\circ$$

$$T_1 \times \frac{4}{5} = T_2 \times \frac{3}{5} \quad \dots(ii)$$

Solving equation (i) and (ii), we get

$$T_1 = 60 \text{ N}$$

11. Answer (4)

$$R = 20 \text{ cm, } f = \frac{R}{2} = 10 \text{ cm}$$

If an object is placed beyond focus of a concave mirror, then the image formed by the mirror is real and inverted.

12. Answer (1)

$$\phi = 3t^2 + 4t + 1$$

$$\varepsilon = \frac{-d\phi}{dt} = \frac{-d}{dt} [3t^2 + 4t + 1]$$

$$\varepsilon = -(6t + 4)$$

At $t = 2 \text{ s}$

$$\varepsilon = -(6 \times 2 + 4) = -16 \text{ V}$$

13. Answer (2)

$$\text{Given, } \frac{R_1 R_2}{R_1 + R_2} = \frac{10}{7} \quad \dots(i)$$

$$\text{Also, } R_1 = 2 \Omega \quad \dots(ii)$$

$$\therefore \frac{2 \times R_2}{2 + R_2} = \frac{10}{7} \Rightarrow 7R_2 = 10 + 5R_2$$

$$2R_2 = 10 \Rightarrow R_2 = 5 \Omega$$

14. Answer (2)

Diatomic molecules have 5 degrees of freedom,

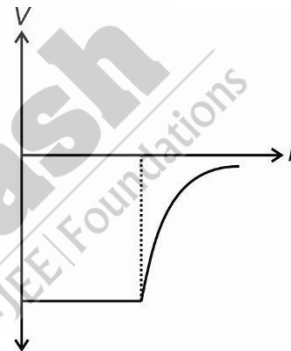
$$\text{Hence, } C_V = \frac{5}{2}R \text{ and } C_P = C_V + R = \frac{7}{2}R$$

15. Answer (1)

Gravitational potential energy of a two point mass system is given by

$$U = \frac{-Gm_1 m_2}{r} \Rightarrow -ve$$

V vs r curve for spherical shell:



Gravitational field intensity due to earth i.e. acceleration due to gravity decreases with increase in altitude.

16. Answer (1)

$$\Delta L = \frac{FL}{AY}$$

Since, F, A and Y are same, hence

$$\Delta L \propto L$$

$$\therefore \frac{\Delta L_1}{\Delta L_2} = \frac{L_1}{L_2} = \frac{3}{4}$$

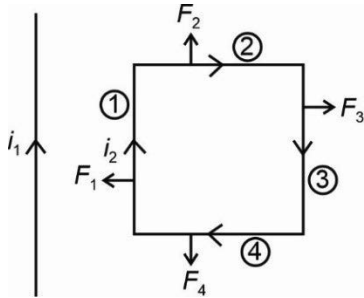
17. Answer (4)

In steady state, the inductors will act as wires of zero resistance.

$$\therefore i = \frac{V}{R} \Rightarrow i = \frac{10}{5} = 2 \text{ A}$$

$$U = \frac{1}{2} Li^2 \Rightarrow U = \frac{1}{2} \times 5 \times 2 \times 2 = 10 \text{ mJ}$$

18. Answer (3)



Magnetic field due to infinite wire:

$$F = \frac{\mu_0 i}{2\pi r} \Rightarrow F \propto \frac{1}{r}$$

$$\therefore F_1 > F_3 \text{ and } F_2 = F_4$$

Hence, the net force will be towards $(-\hat{i})$

19. Answer (4)

Total mechanical energy of a particle executing SHM remains constant, hence it is independent of x .

20. Answer (1)

$$p = \sqrt{2m(K.E.)} \text{ and } \lambda = \frac{h}{p} \Rightarrow \lambda \propto \frac{1}{\sqrt{m}} \text{ for same}$$

Kinetic energy

\therefore Electron will have maximum de-Broglie wavelength

21. Answer (2)

Frequency of radiation in the transition

$$f = RcZ^2 \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

$$f \propto Z^2$$

$$\frac{f_2}{f_1} = \frac{Z_2^2}{Z_1^2} = \left[\frac{3}{1} \right]^2 = 9$$

$$\therefore f_2 = 9f$$

22. Answer (4)

$$P = \frac{1}{f} = (\mu - 1) \left[\frac{1}{R_1} - \frac{1}{R_2} \right]$$

$$P = \frac{1}{f} = \left(\frac{3}{2} - 1 \right) \left[\frac{1}{0.1} + \frac{1}{0.15} \right] = 8.33 \text{ D}$$

23. Answer (4)

Energy of reactant nuclei is less than that of the product nuclei.

$$\text{Energy released } Q = K_2 - 4K_1$$

24. Answer (3)

$$K_{\max.} = E - \phi_0$$

$$K_{\max.} = \frac{hc}{\lambda} - \phi_0$$

$$K_{\max.} = \frac{12400}{5000} (\text{eV}) - 2(\text{eV})$$

$$K_{\max.} = 2.48 \text{ eV} - 2 \text{ eV}$$

$$K_{\max.} = 0.48 \text{ eV}$$

25. Answer (4)

Barrier voltage for Si and Ge are 0.7 V and 0.3 V respectively.

It depends on doping as well as on temperature.

26. Answer (3)

$$\text{Force couple} = \text{Torque} = F \times r$$

$$[\tau] = [\text{MLT}^{-2}] \times [\text{L}] = [\text{ML}^2\text{T}^{-2}]$$

27. Answer (1)

$$P \propto T^2 \Rightarrow PT^{-2} = \text{constant} \quad \dots(i)$$

$$\therefore PV^\gamma = \text{constant}$$

$$\Rightarrow P \left(\frac{T}{P} \right)^\gamma = \text{constant}$$

$$PT^{1-\gamma} = \text{constant} \quad \dots(ii)$$

From (i) and (ii)

$$\frac{\gamma}{1-\gamma} = -2$$

$$\gamma = -2 + 2\gamma$$

$$\frac{C_P}{C_V} = \gamma = 2$$

$$\therefore \frac{C_V}{C_P} = \frac{1}{2}$$

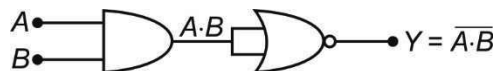
28. Answer (2)

$$F = K \frac{q_1 q_2}{r^2}$$

$$F = \frac{9 \times 10^9 \times 10^{-6} \times 10^{-6}}{(\sqrt{2})^2}$$

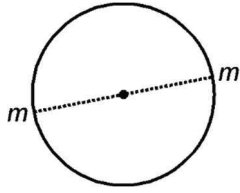
$$F = 4.5 \times 10^{-3} \text{ N}$$

29. Answer (4)



The output of the logic circuit is like NAND gate.

30. Answer (3)



$$F_g = \frac{mv^2}{R}$$

$$\frac{Gmm}{(4r)^2} = \frac{mv^2}{2r}$$

$$v = \sqrt{\frac{Gm}{8r}}$$

$$v = \frac{1}{2} \sqrt{\frac{Gm}{2r}}$$

31. Answer (2)

$$E = \frac{2kp}{r^3}$$

32. Answer (4)

$$U = \frac{Q^2}{2C}$$

As charge will not change and capacitance will decrease, therefore energy will increase.

33. Answer (1)

$$d \sin \theta = n\lambda$$

$$d = \frac{\lambda}{\sin \theta}$$

$$d = \left(\frac{6000}{1/2} \right)$$

$$d = 12000 \text{ \AA}$$

$$d = 1.2 \times 10^{-6} \text{ m}$$

34. Answer (1)

$$\text{Least count} = M - V$$

$$24 \text{ Main scale division} = 25 \text{ Vernier scale division}$$

$$24M = 25V$$

$$V = \frac{24M}{25}$$

$$V = \frac{24}{25} \text{ mm}$$

$$\text{Least count} = 1 - \frac{24}{25}$$

$$= \frac{1}{25} \text{ mm}$$

$$= 0.04 \text{ mm}$$

35. Answer (3)

$$W = T_x - T_x = 0$$

SECTION - B

36. Answer (4)

$$T_1 = 546 + 273 = 819 \text{ K}$$

$$T_2 = 273 \text{ K}$$

$$\frac{T_1}{T_2} = 3$$

$$\frac{E_1}{E_2} = \left(\frac{T_1}{T_2} \right)^4 = 3^4 \Rightarrow E' = \frac{E}{81}$$

37. Answer (1)

Electrostatic field is always conservative in nature.

In E.M. waves, the oscillating electric and magnetic fields are in phase.

38. Answer (4)

$$R = 10 \ \Omega$$

$$X_L = 0.2 \times 200 = 40 \ \Omega$$

$$\cos(\theta) = \frac{1}{\sqrt{2}} = \frac{R}{Z}$$

$$\Rightarrow |(X_L - X_C)| = R$$

$$\text{If } X_C < 40$$

$$\Rightarrow (40 - X_C) = 10 \Rightarrow X_C = 30 \ \Omega$$

$$\text{If } X_C > 40$$

$$\Rightarrow X_C - 40 = 10 \Rightarrow X_C = 50 \ \Omega$$

39. Answer (3)

$$\frac{n \left(\frac{hc}{\lambda} \right)}{t} = P$$

$$\frac{n}{t} = \frac{P \times \lambda}{hc}$$

$$= \frac{60 \times 6600}{12400 \times 1.6} \times 10^{19}$$

$$= 2 \times 10^{20} \text{ photon per second}$$

40. Answer (3)

Magnifying power

$$m = \frac{f_o}{f_e}$$

For maximum magnification

$$f_o > f_e \text{ and } f_o > 0, f_e > 0$$

$$\text{Hence } f_o = 100 \text{ cm}$$

41. Answer (3)

$$S = \frac{G}{(n-1)}, n = \frac{20\text{mA}}{4\text{mA}} = 5$$

$$S = \frac{60}{(5-1)} = 15 \Omega$$

42. Answer (2)

On emitting one positive β -particle, atomic number is decreased by one unit and mass number remains same.

43. Answer (4)

In UCM, velocity of particle is constant in magnitude but its direction changes continuously.

Hence, $|\Delta\vec{P}| \neq 0$

44. Answer (3)

$$\text{Amplitude (A)} = \frac{30}{2 + (x - 20t)^2}$$

Denominator should be minimum

\therefore for $x - 20t = 0$

$$A = \frac{30}{2} = 15 \text{ m}$$

45. Answer (1)

$$n_i^2 = n_e n_h$$

$$n_e = \frac{(1.5 \times 10^{16})^2}{4.5 \times 10^{22}}$$

$$n_e = 5 \times 10^9 \text{ m}^{-3}$$

46. Answer (2)

Speed of transverse wave on a string,

$$v = \sqrt{\frac{T}{\mu}} = \sqrt{\frac{80}{2 \times 10^{-3}}} = 200 \text{ m/s}$$

47. Answer (4)

Moment of inertia of ring about its axis = MR^2

Moment of inertia of a solid cylinder about its axis

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

Moment of inertia of a hollow sphere about tangent

$$= \frac{2}{3}MR^2 + MR^2$$

$$= \frac{5}{3}MR^2$$

Moment of inertia of a solid sphere about its

$$\text{diameter} = \frac{2}{5}MR^2$$

48. Answer (1)

$$\varepsilon = Blv \Rightarrow 16 = B \times \frac{1}{2} \times 6 \Rightarrow B = \frac{16}{3} \text{ T}$$

49. Answer (4)

For complementary angles, the horizontal range will be equal, provided the projection speed is same.

50. Answer (3)

Argument of "sin" is dimensionless, hence C has no dimensions and $[B] = [T^{-1}]$

Also $[x] = [A] = [L]$

$$\therefore \left[\frac{AB}{C} \right] = [LT^{-1}]$$

Unit of $\frac{AB}{C}$ is $\frac{\text{m}}{\text{s}}$

CHEMISTRY

SECTION-A

51. Answer (2)

$$\text{Mole (X}_2) = \frac{16}{\text{Molar mass}} = 0.1$$

Molar mass (X₂) = 160 g

Gram atomic mass of X = 80 g

52. Answer (4)

Wavelength order

Radio waves > Microwaves > Visible > Ultraviolet

53. Answer (3)

Angular momentum of an electron in an orbit.

$$= n \frac{h}{2\pi} = 4 \frac{h}{2\pi} = \frac{2h}{\pi}$$

54. Answer (3)

Principal quantum number determines size of the orbital and also to a large extent the energy of orbital.

$${}_{20}\text{Ca} = [\text{Ar}] 4s^2$$

$$n = 4$$

$$l = 0$$

$$m_l = 0$$

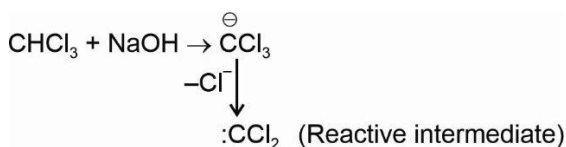
55. Answer (1)

NO	–	Neutral
Cl ₂ O ₇	–	Acidic
CaO	–	Basic
Al ₂ O ₃	–	Amphoteric

56. Answer (4)

Aldehydes and ketones having at least one –CH₃ group linked to carbonyl carbon atom can be oxidised using I₂ + NaOH (sodium hypohalite), so, formaldehyde (HCHO) does not form precipitate of iodoform (CHI₃).

57. Answer (3)



58. Answer (4)

Higher bond order implies shorter bond length.

Species	Bond order
O ₂ [–]	1.5
O ₂	2
O ₂ ⁺	2.5
O ₂ ^{2–}	1

59. Answer (4)

Two important man-made silicates are glass and cement.

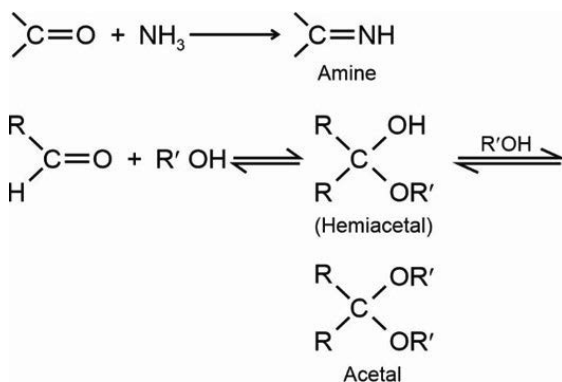
60. Answer (4)

In K₃[CoF₆] hybridization is sp³d².

61. Answer (2)

Anti-Markovnikov's addition takes place. The major product is primary alcohol.

62. Answer (2)



63. Answer (1)

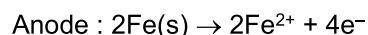
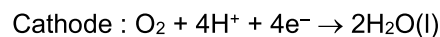
Element	Δ _f H ₁ (kJ mol ⁻¹)
Si	786
Ge	761
Sn	708
Pb	715

64. Answer (3)

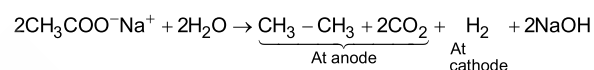
Thiamine (Vitamin B₁) is water soluble and its deficiency causes beri beri.

65. Answer (2)

In corrosion :



66. Answer (4)



The aqueous solution of NaOH is basic in nature.

67. Answer (1)

Trigonal pyramidal ⇒ XeO₃

Square pyramidal ⇒ XeOF₄

Linear ⇒ XeF₂

Distorted octahedral ⇒ XeF₆

68. Answer (1)

Compounds Δ_fH⁰(kJ mol⁻¹)

PH₃ 13.4

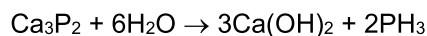
AsH₃ 66.4

69. Answer (3)

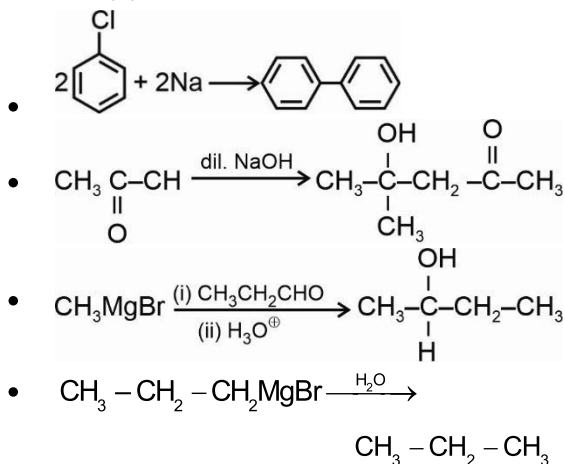
In [NiCl₄]^{2–} Ni is Ni²⁺ [3d⁸] and Cl[–] is a weak field ligand. Thus, it has 2 unpaired electrons,

$\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow \uparrow \uparrow$ 3d⁸. Hence, paramagnetic.

70. Answer (2)



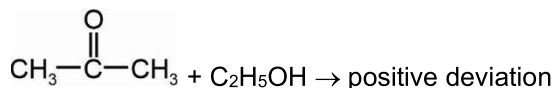
71. Answer (4)



72. Answer (4)

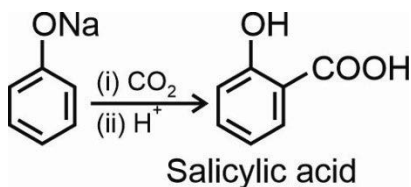
- NaHCO_3 does not react with aldehyde.
- NaHCO_3 releases $\text{CO}_2(\text{g})$ on reaction with stronger acids than carbonic acid.

73. Answer (3)

 $\text{C}_6\text{H}_6 + \text{C}_6\text{H}_5\text{CH}_3 \rightarrow$ Ideal solutionn-heptane + n-hexane \rightarrow Ideal solution $\text{C}_2\text{H}_5\text{Cl} + \text{C}_2\text{H}_5\text{Br} \rightarrow$ Ideal solution

74. Answer (2)

Kolbe's reaction



75. Answer (1)

More stable is the carbocation, faster is the rate of $\text{S}_{\text{N}}1$ reaction.

76. Answer (3)

$$\Delta H_{\text{isomerisation}} = (\Delta H_{\text{C}})_{\text{R}} - (\Delta H_{\text{C}})_{\text{P}}$$

$$= -1359.2 - (-1336.0) = -23.2 \text{ kJ/mol}$$

77. Answer (2)

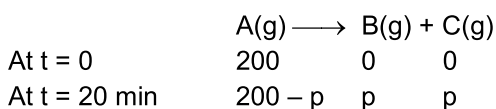
Most common oxidation states of Ni and Ti are +2 and +4 respectively.

78. Answer (4)

 CH_3COONa is a salt of weak acid and strong base

$$\text{whose pH} = 7 + \frac{1}{2} (\text{pK}_a + \log C)$$

79. Answer (1)



$$\text{Given: } 200 - p + p + p = 300$$

$$\Rightarrow p = 100 \text{ mmHg}$$

So, t = 20 minutes is the half-life period of the reaction

$$\therefore k = \frac{0.693}{t_{1/2}} = \frac{0.693}{20} \approx 0.035 \text{ min}^{-1}$$

80. Answer (4)

- 2 g Fe atoms = $\frac{2}{56}$ mole atoms = $\frac{1}{28}$ mole atoms
- 2 g H_2O molecules = $\frac{2}{18}$ mole molecules = $\frac{6}{18} = \frac{1}{3}$ mole atoms
- 16 g CH_4 = 1 mole molecules = 5 mole atoms
- 10 g of H_2 = 10 mole atoms

81. Answer (1)

N_2^+ contains one unpaired electron hence paramagnetic.

82. Answer (1)

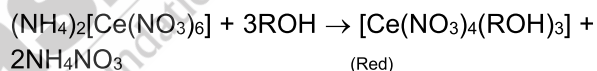
Brass is an alloy of copper and zinc

83. Answer (3)

For n + l = 5, one 5s, three 4p and five 3d orbitals are possible.

84. Answer (4)

Alcohols react with ceric ammonium nitrate to give red coloured complex.

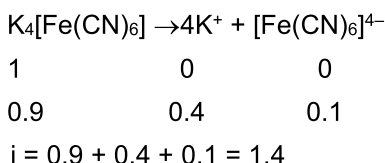


85. Answer (4)

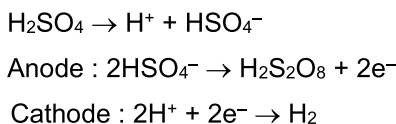
$\text{HClO} > \text{HClO}_2 > \text{HClO}_3 > \text{HClO}_4$ [Oxidising power].

SECTION - B

86. Answer (3)

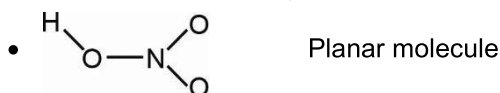


87. Answer (3)



88. Answer (4)

- HNO_3 manufacture by Ostwald's process.



- $\text{I}_2 + 10\text{HNO}_3 \rightarrow 2\text{HIO}_3 + 10\text{NO}_2 + 4\text{H}_2\text{O}$

89. Answer (2)

Histidine and Lysine are essential amino acids.

104. Answer (3)
The papilionaceous corolla is characteristic feature of members of Fabaceae family.
In members of Fabaceae family, flowers show bilateral symmetry.
105. Answer (4)
Dicot stem contains endodermis rich in starch grains and the layer is referred to as starch sheath.
106. Answer (3)
During cell cycle, chloroplast duplication and tubulin protein synthesis occur in G₂ phase of interphase.
107. Answer (2)
The size of a typical bacterial cell is 1-2 μm
108. Answer (1)
External electron donor (H₂O) is required during non-cyclic photophosphorylation.
109. Answer (2)
During conversion of succinyl-CoA to succinic acid, substrate level phosphorylation occurs.
110. Answer (4)
Seeds have embryo, seed coat and may have endosperm but not the pericarp. Pericarp is present in the fruit.
111. Answer (1)
Mango is a drupe and it develops from monocarpellary superior ovary.
112. Answer (2)
Haemophilia is sex linked (X-linked) recessive disorder.
Trait under study is autosomal recessive.
Parents carry the trait but do not express it.
Myotonic dystrophy is autosomal dominant disorder.
113. Answer (4)
Both strands of DNA run in antiparallel fashion and are complementary to each other.
114. Answer (3)
Eukaryotic flagella are membrane bound structures with 9+2 arrangement of microtubules.
They arise from basal bodies that is centrioles having cartwheel like appearance and is surrounded by amorphous pericentriolar material.
115. Answer (3)
Pairing of homologous chromosomes is seen in prophase I of meiosis I, which is not observed in prophase of mitosis.
116. Answer (3)
Albugo causes white rust of crucifer (mustard group).
Septate hyphae are present in *Penicillium*.
Colletotrichum is an imperfect fungi as it does not exhibit sexual reproduction. *Neurospora* is used extensively in biochemical and genetic work.
117. Answer (3)
Megaspore mother cell is generally formed in the micropylar region of the nucellus.
118. Answer (4)
Vascular bundles are nearly similar in size due to presence of parallel venation in monocot leaf. In these leaves, mesophyll is not differentiated.
119. Answer (4)
Wildlife sanctuaries are 'in situ' conservation strategies.
120. Answer (2)
Isolation of DNA is first step in DNA fingerprinting followed by DNA digestion into fragments, electrophoresis, blotting and autoradiography.
121. Answer (1)
Regarding ABO blood group system in human beings
Total number of phenotypes : Total number of genotypes
= 4 : 6
= 2 : 3
122. Answer (2)
In pleiotropy, a single gene product may produce more than one effect.
123. Answer (2)
The terminator in a transcription unit is located towards 3' end (downstream) of the coding strand.
124. Answer (1)
Trichoderma species are free-living fungi and are very common in the root ecosystems.
125. Answer (3)
Gibberellins are responsible for increasing sugarcane yield by increasing the length of stem. Acetyl CoA is the precursor of gibberellin.

126. Answer (3)

Small animals have a larger surface area relative to their volume.

127. Answer (1)

In vertebrates, highest number of species are of fishes.

128. Answer (4)

In pond ecosystem and grassland ecosystem pyramid of number is upright. In tree ecosystem pyramid of number may be inverted or spindle-shaped.

129. Answer (2)

In *lac* operon, regulator gene exhibits constitutive expression.

130. Answer (4)

In *Opuntia*, stem modifies into flattened structure that contains chlorophyll and carry out photosynthesis.

131. Answer (4)

The recombination is an enzyme mediated process which occurs during pachytene of prophase I of meiosis.

132. Answer (4)

Light is limiting factor for plants growing in dense forests. The current concentration of CO₂ in the atmosphere is limiting for C₃ plants.

133. Answer (3)

Number of different types of gametes = 2ⁿ

n = number of heterozygotes = 3

$$2^3 = 8$$

134. Answer (1)

Chlamydomonas and *Chlorella* have been included in kingdom Protista, in the five kingdom classification.

135. Answer (3)

In ABO blood grouping there are more than two alleles governing the same character. Since in an individual only two alleles can be present, multiple alleles can be found only when population studies are made.

SECTION - B

136. Answer (3)

Carrot (storage root), *Rhizophora* (respiratory root), Banyan tree (prop root), Maize (stilt root).

137. Answer (4)

Golgi apparatus neither have DNA nor RNA.

138. Answer (2)

Given meiocyte has 30 chromosomes with 60 chromatids in prophase I. Each daughter cell after meiosis I will have 15 chromosomes and total 30 chromatids and after meiosis II, 15 chromosomes and 15 chromatids.

139. Answer (4)

Obligate anaerobes respire anaerobically only.

140. Answer (3)

The companion cells help in maintaining the pressure gradient in the sieve tubes.

141. Answer (3)

Ulothrix is a green alga, has flagellated and similar sized fusing gametes.

142. Answer (1)

Most of the fruits are true fruits (eucarpic). Mango is true fruit. Apple is pseudocarpic (false) fruit. Banana is parthenocarpic fruit.

143. Answer (2)

Bulliform cells are large, empty and colourless.

144. Answer (2)

For linear dsDNA, Number of phosphodiester bonds in two strands = number of nucleotides minus (–) two.

12 base pairs = 24 nucleotides.

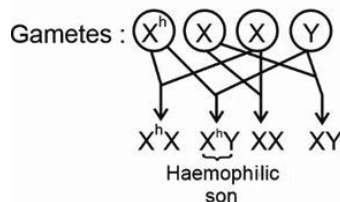
So, 24 – 2 = 22 phosphodiester bonds.

145. Answer (3)

If a predator is too efficient and overexploits its prey, then the prey might become extinct and following it, the predator will also become extinct for lack of food. This is the reason why predators in nature are 'prudent'.

146. Answer (3)

Parents : X^hX × XY



147. Answer (1)

RNA polymerase I transcribes 5.8S, 18S, 28S rRNA.

148. Answer (3)

When fats are used in respiration, the RQ is less than 1 because O_2 consumption is higher than CO_2 released.

149. Answer (3)

Ethylene initiates sprouting of potato tubers.

150. Answer (3)

Vegetative cells are bigger in size and have abundant food reserve and irregularly shaped nucleus.

ZOOLOGY

SECTION-A

151. Answer (1)

Proboscis is the anterior most part of *Balanoglossus*.

152. Answer (4)

Bufo – Amphibia

Calotes – Reptilia

Pterophyllum – Osteichthyes

Aptenodytes – Aves

Paired pharyngeal gill slits is the fundamental characteristic of the chordates.

153. Answer (1)

In frogs, digestion of food takes place by the action of HCl and gastric juices secreted from the walls of the stomach.

154. Answer (3)

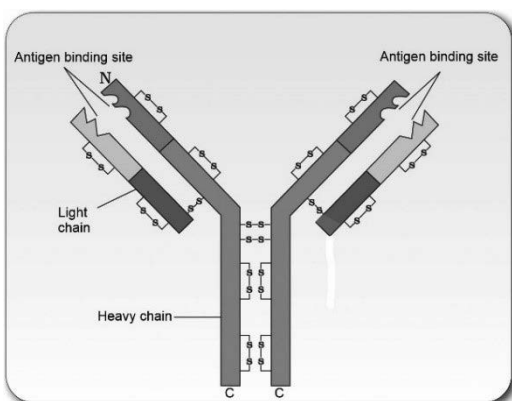
The colour of the dorsal side of the body of *Rana tigrina* is generally olive green with dark irregular spots.

155. Answer (1)

Epinephrine and norepinephrine are commonly known as catecholamines.

Parathyroid hormone increases the Ca^{2+} level in the blood.

156. Answer (3)



157. Answer (2)

In rDNA technology, rDNA means DNA with a piece of foreign DNA.

158. Answer (3)

In a person suffering from ADA deficiency, if the gene isolated from marrow cells producing ADA is introduced into cells at early embryonic stages, it could be a permanent cure.

159. Answer (2)

Cytosine is not a nucleoside, it is a nitrogenous base.

160. Answer (3)

Rosie is a transgenic cow producing human protein-enriched milk (α -lactalbumin).

161. Answer (2)

In the experiment performed by S.L Miller in 1953, he observed the formation of amino acids. Amino acids form polymeric compounds by the formation of peptide bonds with each other.

162. Answer (3)

The female reproductive system consists of a pair of ovaries along with a pair of oviducts, uterus, cervix, vagina and the external genitalia located in the pelvic region.

It supports the process of ovulation, fertilization, pregnancy, birth and child care.

163. Answer (4)

X – GnRH

Y – LH

Z – FSH

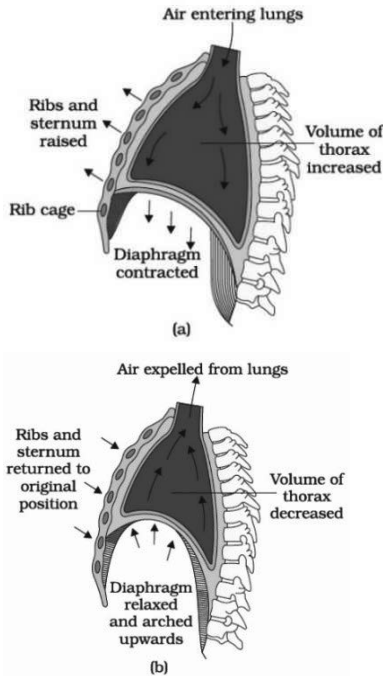
LH and FSH are released from the anterior pituitary gland and are considered as trophic hormones.

164. Answer (2)

Ideal contraceptives should not interfere with the sexual drive, desire and/or the sexual act of the user.

165. Answer (4)
Muscle fibre is the anatomical unit of muscles.
166. Answer (2)
The flower tops, leaves and the resin of *Cannabis* plant (*Cannabis sativa*) are used in various combinations to produce marijuana, hashish, charas and ganja.
167. Answer (1)
Maximum reabsorption of water occurs in PCT even in the presence of ADH.
168. Answer (3)
Before industrialisation set in, thick growth of almost white-coloured lichen covered the trees. In that background, the white-winged moths survived but the dark-coloured moths were picked out by predators.
169. Answer (2)
Charles Darwin – Talked about minor heritable variations
Thomas Malthus – His work influenced Darwin
Karl Ernst von Baer – Embryos never pass through the adult stages of other animals
170. Answer (1)
Saturated fatty acids are without any C = C bonds. Unsaturated fatty acids have one or more C = C bonds.
171. Answer (2)
Smaller the fragment size, the farther it moves from the cathode.
172. Answer (3)
Sino-atrial node (SAN) is located in the right upper corner of the right atrium. The SAN can generate the maximum number of action potentials and is responsible for initiating and maintaining the rhythmic contractile activity of heart hence, it is called the pacemaker of human heart.
173. Answer (4)
Chitinous exoskeleton is present in arthropods like *Limulus*.
174. Answer (3)
Macrophages act as the HIV factory.
Morphine is extracted from *P. somniferum*.
The mode of transmission for amoebic dysentery is faeco-oral route and houseflies act as mechanical carriers of the causative pathogen.
175. Answer (3)
Thyrocalcitonin (TCT) regulates the blood calcium level and is produced by the thyroid gland.
PTH is a hypercalcemic hormone.
176. Answer (4)
Amphioxus belongs to the subphylum Cephalochordata. Notochord is present only in the larval tail of urochordates like *Ascidia*, *Salpa*, etc.
177. Answer (2)
 pO_2 in systemic vein and pulmonary artery = 40 mm Hg. pCO_2 in systemic artery = 40 mm Hg.
178. Answer (1)
LH surge induces ovulation. The corpus luteum secretes large amount of progesterone which is essential for maintenance of the endometrium.
179. Answer (1)
Efferent arteriole emerges from glomerulus. Cortical nephrons have a short loop of Henle and they are more in number compared to juxta-medullary nephrons.
PCT and DCT are the coiled regions of nephrons.
180. Answer (1)
Transfer of an ovum collected from a donor into the fallopian tube (GIFT – Gamete Intra Fallopian Transfer) of another female who cannot produce one, but can provide suitable environment for fertilisation and further development is one of the methods under ART. Intra Cytoplasmic Sperm Injection (ICSI) is another specialised procedure to form an embryo in the laboratory in which, a sperm is directly injected into the ovum. Infertility cases either due to inability of the male partner to inseminate the female or due to very low sperm counts in the ejaculates, could be corrected by Artificial Insemination (AI) technique.
181. Answer (1)
Ligaments attach one bone to another bone.
182. Answer (2)
At electrical synapses, the membranes of pre and post synaptic neurons are in very close proximity and electrical current can flow directly from one neuron to another neuron.
183. Answer (2)
Tetany – Rapid spasms (wild contractions) in muscles due to low Ca^{2+} in body fluid.
Myasthenia gravis – Auto-immune disorder affecting neuromuscular junction leading to fatigue, weakening and paralysis of skeletal muscles.

184. Answer (1)

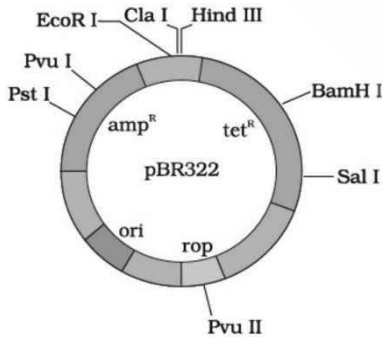


185. Answer (4)

Subphylum – Tunicata
 Division – Agnatha
 Super class – Pisces
 Class – Cyclostomata

SECTION - B

186. Answer (2)



187. Answer (1)

Ureose glands are present only in male cockroaches.

188. Answer (3)

Malfunctioning of kidneys can lead to accumulation of urea in blood, a condition called uremia, which is highly harmful and may lead to kidney failure.

189. Answer (3)

Red muscle fibers can also be called aerobic muscles.

190. Answer (1)

Sperms with normal shape and size and vigorous motility = $300 \text{ million} \times \frac{60}{100} \times \frac{40}{100} = 72 \text{ million}$ sperms per ejaculate

191. Answer (4)

Chronic smoking causes damaging of alveoli and difficulty in breathing resulting in emphysema.

192. Answer (1)

Lipid soluble hormones *i.e.* steroidal hormones and iodothyronines are able to cross the lipid bilayer of the plasma membrane and hence, they move inside the target cell without any difficulty. After entering the cell, they attach with their specific intracellular receptors.

193. Answer (2)

Interferons are synthesized in response to viruses.

194. Answer (3)

In humans, the role of O₂ is quite insignificant in the regulation of respiratory rhythm.

195. Answer (3)

A palindrome in DNA is a sequence of base pairs that reads the same on the two strands when orientation of reading is kept the same. This sequence reads the same on the two strands in 5' → 3' direction.

196. Answer (3)

The applications of biotechnology include therapeutics, diagnostics, genetically modified crops for agriculture, processed food, waste treatment, bioremediation and energy production.

197. Answer (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 towards the inner medullary interstitium.

198. Answer (4)

Cockroaches exhibit mosaic vision with more sensitivity but less resolution.

199. Answer (3)

In blood group 'AB', A and B antigens are present on RBCs, but no antibodies are present in the plasma.

200. Answer (1)

Insulin, haemoglobin, collagen and elastin are proteins and proteins are always heteropolymers. Cellulose, glycogen and starch are polysaccharides and are homopolymers. Glycerol is a lipid