13/02/2025

CODE-B

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 - 4** | **Time : 3 Hrs.**

Answers

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

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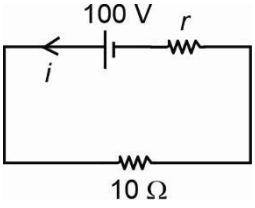
MOCK TEST for NEET-2025

MM : 720 **Test - 4** Time : 3 Hrs.

Answers & Solutions

PHYSICS

1. Answer (2)



$$i = \frac{100}{10 + r}$$

$$\Rightarrow \quad 5 = \frac{100}{10 + r}$$

$$\Rightarrow \quad 10 + r = 20$$

$$r = 10\ \Omega$$

2. Answer (4)

Taking mean of several observations minimises the random errors that may occur due to unknown reasons in an experiment.

3. Answer (3)

We know,

Speed of truck w.r.t. train,

$$v = 20 - 72\left(\frac{5}{18}\right)$$

$$v = 0$$

$\therefore$ Time taken for overtake,

$$t = \sqrt{\frac{(200 + 100 + 24)^2}{0.5}}$$

$t = 36$ s

4. Answer (1)

We know,

(u) speed of projection = speed of strike

$\therefore$ Speed at highest point = $u\sin 30°$

$$= 20\left(\frac{1}{2}\right) = 10 \text{ m/s}$$

5. Answer (3)

We know,

$a_t = \alpha r = 2(4) = 8\ \text{m/s}^2$

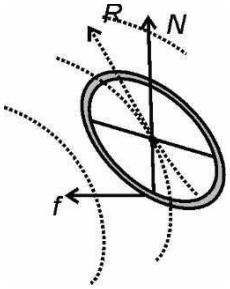
$a_c = r\omega^2 = r(\omega_0 + \alpha t)^2 =$ variable

$\omega_0 = 4$ rad/s

Thus, $a_t \neq 0$

6. Answer (1)

During bending of a cyclist, the centripetal force is provided by friction.



7. Answer (4)

According to conservation of linear momentum,

$2(10) + 4(20) = 2v_1 + 4v_2$

$\therefore\ v_1 + 2v_2 = 50$ …(i)

Also, $20 - 10 = v_1 - v_2$

$10 = v_1 - v_2$ ...(ii)

From (i) and (ii), we get

$$v_1 = \frac{40}{3}\text{m/s and } v_2 = \frac{70}{3}\text{m/s}$$

$$\therefore \quad \frac{v_1}{v_2} = \frac{4}{7}$$

8. Answer (2)

Here $F_{ext} = 0$ $\therefore a_{com} = 0$

Initially COM was at rest

$\therefore$ It will remain at rest

9. Answer (2)

Angular inpulse $j = \Delta L \xrightarrow{\text{unit}} \text{kg m}^2\text{s}^{-1}$

10. Answer (1)

$$\frac{nhc}{\lambda} = P$$

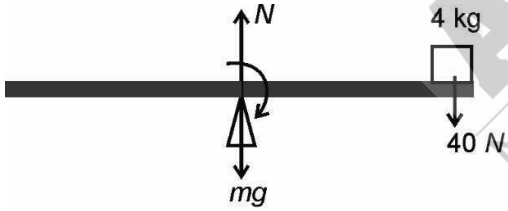
$$n = \frac{P \times \lambda}{hc}$$

$$= \frac{60 \times 5000}{12400 \times 1.6 \times 10^{-19}} = 1.5 \times 10^{20}$$

11. Answer (1)

From the FBD,

$\tau = I\alpha$



$$40(4) = \left[\frac{18(8)^2}{12} + (4)(4)^2\right]\alpha$$

$40(4) = (160)\alpha$

$\therefore \alpha = 1$ rad/s^2

12. Answer (1)

We know,

$$B = v\frac{dp}{dv}$$

$$\because \frac{dv}{v} = 1$$

$\therefore B = dp = 2$ GPa

13. Answer (1)

We know, $E = \frac{-\partial V}{\partial x}\hat{i} - \frac{\partial V}{\partial y}\hat{j}$

$\therefore \quad E_x = -2xy\hat{i} = -4\hat{i}$ V/m

$E_y = -(x^2 - 2y)\hat{j} = -(1-4) = +3\hat{j}$ V/m

$E = -4\hat{i} + 3\hat{j}$

14. Answer (1)

Kirchoff's current law is based upon conservation of charge.

15. Answer (1)

Resistance of ideal ammeter is zero.

16. Answer (1)

Bohr magneton is the magnetic moment associated with electron in first orbit of H-atom.

17. Answer (3)

We know, $\Delta q = \frac{\Delta\phi}{R} = \frac{A(B_2 - B_1)}{k} = \frac{20 \times 10^{-4}(4)}{10}$

$\Delta q = 0.8$ mC

18. Answer (4)

We know, in half cycle, $I_{av} = \frac{2I_0}{\pi}$

$\therefore \quad I_{av} = \frac{2(4)}{\pi} = \frac{8}{\pi}$ A

19. Answer (2)

γ-rays has highest frequency while ultraviolet has lowest frequency among the given EM waves.

20. Answer (2)

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

In air, $\frac{1}{2} = (1.5 - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$ ...(i)

In liquid, $\frac{1}{f'} = \frac{1.5 - 1.25}{1.25}\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

$\frac{1}{f'} = \frac{0.25}{1.25}\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$ ...(ii)

From (i) and (ii), we get

$f' = 5$ cm

21. Answer (1)

Spherical wavefronts are formed by point source of light.

22. Answer (4)

Energy of photon = $E = \frac{hc}{\lambda}$

23. Answer (4)

δ vs i graph for a prism is not a parabola

$\therefore$ it is not symmetric

Hence, $50 - x < 70 - 50$

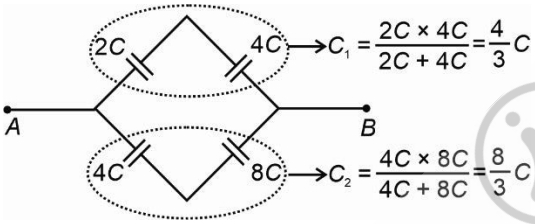
$-x < -30$

$x > 30$

24. Answer (3)

Balanced Wheatstone bridge condition

$\therefore$ Equivalent circuit can be drawn as



$C_{eq} = \frac{4}{3}C + \frac{8}{3}C = 4C$

25. Answer (2)

$\vec{A} + \vec{B} = \vec{E}$ …(i)

$\vec{A} + \vec{C} = \vec{D}$

$-\vec{A} - \vec{C} = -\vec{D}$ …(ii)

(i) + (ii)

$\vec{B} - \vec{C} = \vec{E} - \vec{D}$

$\vec{B} = \vec{E} - \vec{D} + \vec{C}$

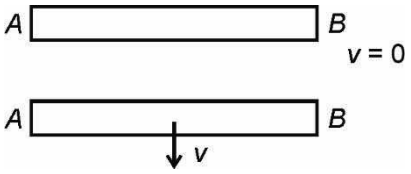
26. Answer (2)

$$\frac{R^2}{8h} + 2h = \frac{\left(\frac{u^2 \sin 2\theta}{g}\right)^2}{\frac{8u^2 \sin^2\theta}{2g}} + 2\frac{u^2 \sin^2\theta}{2g}$$

$$= \frac{u^2 \cos^2\theta}{g} + \frac{u^2 \sin^2\theta}{g}$$

$$= \frac{u^2}{g}$$

27. Answer (3)



By conservation of angular momentum about point A,

$mva = \frac{m(2a)^2}{3}\omega$

$\omega = \frac{3v}{4a}$

28. Answer (1)

$\omega = 2\pi f$

$\omega = 2\pi \times 10$

$= 20\pi$

$A = 0.05$ m

Equation of SHM

$x = 0.05 \sin(20\pi t + \delta)$

$-0.05 = 0.05 \sin(20\pi t + \delta)$

$\sin\delta = -1$

$\delta = \left(\frac{3\pi}{2}\right)$

$x = 0.05 \sin\left(20\pi t + \frac{3\pi}{2}\right)$

29. Answer (2)

Given process is isobaric.

So, $W = nR\Delta T$

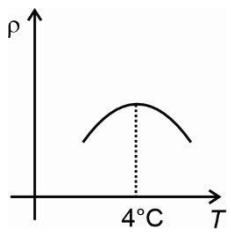
$\Delta U = \frac{nR\Delta T}{\gamma - 1}$

$\frac{\Delta U}{W} = \frac{1}{\gamma - 1}$

$= \frac{1}{\frac{5}{3} - 1}$

$= \frac{3}{2}$

30. Answer (1)



31. Answer (1)

$$\frac{Q_1}{4\pi R^2} = \frac{Q - Q_1}{4\pi(3R)^2}$$

$9Q_1 = Q - Q_1$

$10Q_1 = Q$

$$Q_1 = \frac{Q}{10}$$

32. Answer (1)

$$t = \frac{d}{\frac{c}{\mu}}$$

$$= \frac{\frac{3}{2} \times 50 \times 10^{-3}}{3 \times 10^8}$$

$= 25 \times 10^{-11}$

$t = 250$ ps

33. Answer (4)

$$\beta = \frac{\lambda D}{d}$$

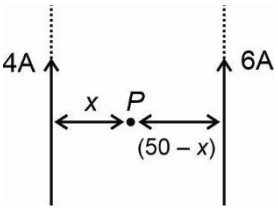
$$\frac{\lambda_1 D_1}{d_1} = \frac{\lambda_2 D_2}{d_2}$$

$$\frac{d_1}{d_2} = \frac{\lambda_1}{\lambda_2} \times \frac{D_1}{D_2}$$

$$= \frac{400}{500} \times \frac{1.2}{1.6}$$

$$= \frac{4}{5} \times \frac{3}{4} = \frac{3}{5}$$

34. Answer (1)



At point P

$\vec{B}_1 + \vec{B}_2 = 0$

$|\vec{B}_1| = |\vec{B}_2|$

$$\Rightarrow \frac{\mu_0}{4\pi}\frac{2I_1}{x} = \frac{\mu_0}{4\pi}\frac{2I_2}{(50-x)}$$

$$\Rightarrow \frac{4}{x} = \frac{6}{50-x}$$

$\Rightarrow 100 - 2x = 3x$

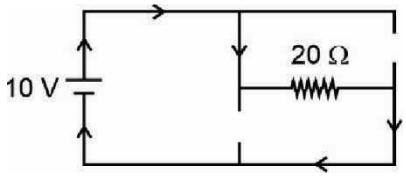
$x = 20$ cm

35. Answer (2)

In moderately doped p-type semiconductor, the fermi level lies in the forbidden energy gap nearer to valence band.

36. Answer (3)

The circuit can be modified as



$$I = \frac{V}{R}$$

$$I = \frac{10}{20}$$

$= 0.5$

37. Answer (1)

At orbital speed the particle acquires a circular trajectory which becomes elliptical if speed increases.

At escape speed it becomes parabolic while it changes to hyperbolic on further increasing the speed.

38. Answer (4)

Focal length of concave mirror $f = \frac{R}{2}$

i.e., independent of surrounding medium.

39. Answer (2)

By conservation of energy, we get

$$\frac{1}{2}mv^2 = \frac{mgh}{\left(1+\frac{h}{R}\right)}$$

Acc. to problem,

$$v = \frac{3}{4}v_e = \frac{3}{4}\sqrt{2gR}$$

$$\frac{1}{2} \times \frac{9}{16} \times 2gR = \frac{gh}{\left(1+\frac{h}{R}\right)}$$

or $\frac{9}{16} = \frac{h}{(R+h)}$

$\therefore \quad h = \frac{9R}{7}$

40. Answer (3)

Work done in cyclic process = Area of the loop

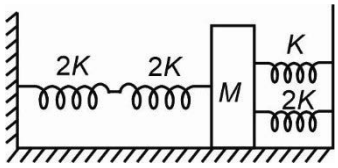
$$= \frac{1}{2} \times 2 \times 4 = 4\,\text{J}$$

$W_{cycle} = -4$ J

41. Answer (2)

For ferromagnetic substance susceptibility is positive and large.

42. Answer (2)



Two springs on the L.H.S. of block *M* are in series and two springs on the R.H.S. of block *M* are in parallel. These combination of springs will be considered in parallel with each other. Thus effective spring constant.

$$K_{\text{eff}} = \frac{2K \times 2K}{2K + 2K} + (K + 2K) = 4K$$

$$\therefore \quad \text{Frequency } \nu = \frac{1}{2\pi}\sqrt{\frac{K}{M}} = \frac{1}{2\pi}\sqrt{\frac{4K}{M}}$$

43. Answer (1)

Force on moving charge by magnetic field

$$\vec{F} = q\left(\vec{V} \times \vec{B}\right)$$

$\therefore \ \vec{F} \cdot \vec{V} = 0 \Rightarrow$ work done = zero

44. Answer (3)

$$\tau_{\max} = NiAB = 1 \times i \times (\pi r^2) \times B$$

$$= \pi i \left(\frac{L}{2\pi}\right)^2 B = \frac{L^2 iB}{4\ \pi}$$

45. Answer (1)

Relation between kinetic energy (K.E.) and momentum (*P*)

$$\text{K.E} = \frac{P^2}{2m}$$

$$P = \sqrt{2m\,(\text{K.E.})}$$

$$P \propto \sqrt{m}$$

CHEMISTRY

46. Answer (3)

Value of angular node is given by l.

Radial node = n – l – 1

= 5 – 1 – 1 = 3

47. Answer (3)

$E°_{cell} = E°_R - E°_L$

= [0.80 – (– 0.25)] V = 1.05 V

$\Delta G° = -nFE°$

= – 2 × 96500 × 1.05 J

= – 202.65 kJ

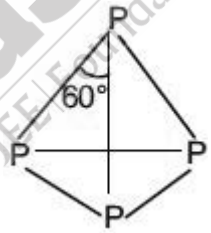
48. Answer (1)

Stronger the – R effect of p-substituent, stronger is the acid.

49. Answer (3)

- Actinoids are highly reactive metals, especially when finely divided.
- Actinoid contraction is greater from element to element than lanthanoid contraction resulting for poor shielding by 5*f* electrons.
- Many trivalent lanthanoids ions are coloured both in solid state and in aqueous solutions.
- Lanthanoids have typical metallic structure and are good conductors of heat and electricity.

50. Answer (4)



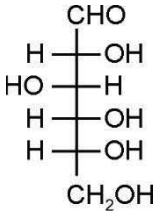
51. Answer (3)

$$NO_3^- + 3Fe^{2+} + 4H^{\oplus} \rightarrow NO + 3Fe^{3+} + 2H_2O$$

$[Fe(H_2O)_6]^{2+} + NO \rightarrow [Fe(H_2O)_5\,(NO)]^{2+} + H_2O$

Brown ring complex

52. Answer (4)



53. Answer (1)

Lesser the extent of back bonding, higher is the Lewis acidic strength of boron halide.

54. Answer (2)

XeF_4 is square planar in shape.

55. Answer (3)

For a salt of weak acid and weak base the pH is independent of its concentration.

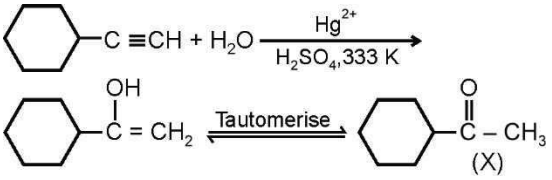
56. Answer (2)

$$\Delta S = 2.303\ nR \log \frac{V_f}{V_i}$$

$$\Delta S = 2.303 \times 1 \times R \log \frac{10}{1}$$

$$\Delta S = 2.303R$$

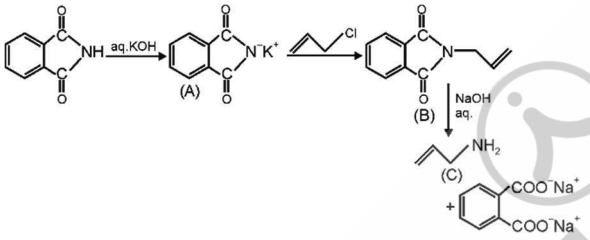
57. Answer (1)



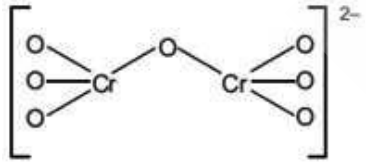
58. Answer (4)

Alcohol does not give addition product with $NaHSO_3$

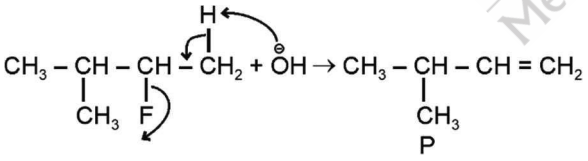
59. Answer (2)



60. Answer (2)



61. Answer (3)



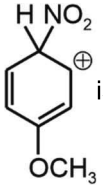
62. Answer (4)

H_2SO_3	:	Sulphurous acid
H_2SO_4	:	Sulphuric acid
$H_2S_2O_8$	:	Peroxodisulphuric acid
$H_2S_2O_7$	:	Pyrosulphuric acid

63. Answer (1)

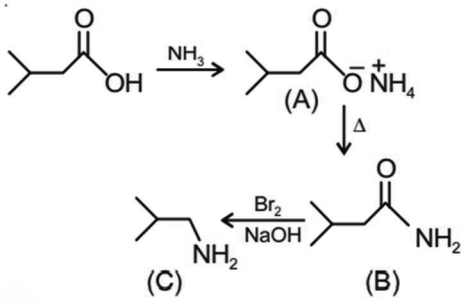
Ion	**$\lambda°$ (S cm^2 mol^{-1}) at 298 K**
H^+	349.6
K^+	73.5
Mg^{2+}	106.0
OH^-	199.1

64. Answer (2)

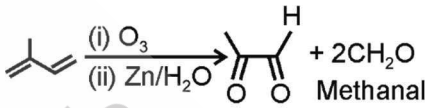


is most stable due to +M effect of $-OCH_3$ group.

65. Answer (2)



66. Answer (2)



(methyl glyoxal)

67. Answer (2)

$$k = \frac{0.693}{t_{1/2}}$$

$$t = \frac{1}{k} \times 2.303 \log \frac{a}{a-x}$$

$$= \frac{t_{1/2} \times 2.303}{0.693} \log \frac{100}{80}$$

$$= \frac{25 \times 2.303}{0.693}[\log 10 - 3\log 2] = 8.05 \text{ min}$$

$\simeq 8$ min

68. Answer (2)

$$\overset{+7}{MnO_4^{\ominus}} + 5e^- \longrightarrow Mn^{2+}, \quad \Delta G_1^\circ = -5 \times F \times E_1^\circ \ldots.(1)$$

$$\overset{+4}{MnO_2} + 2e^- \longrightarrow Mn^{2+}, \quad \Delta G_2^\circ = -2 \times F \times E_2^\circ \quad \ldots.(2)$$

On subtracting (2) from (1)

$$MnO_4^{\ominus} + 3e^- \longrightarrow MnO_2, \ \Delta G_3^\circ = -3 \times F \times E_3^\circ$$

$$\Delta G_3^\circ = \Delta G_1^\circ - \Delta G_2^\circ$$

$$-3FE_3^\circ = -5FE_1^\circ - (-2FE_2^\circ)$$

$$3FE_3^\circ = 5FE_1^\circ - 2FE_2^\circ$$

$$E_3^\circ = \frac{5E_1^\circ - 2E_2^\circ}{3} = \frac{5 \times 1.51 - 2 \times 1.23}{3} = 1.70\,V$$

69. Answer (4)

Tertiary amines do not react with Hinsberg's reagent.

70. Answer (3)

B shows diagonal relationship with Si.

71. Answer (2)

$$CO(g)+\frac{1}{2}O_2(g)\longrightarrow CO_2(g)$$

$$\Delta n_g=\left(1-\frac{3}{2}\right)=-\frac{1}{2}$$

$\Delta H = \Delta U + \Delta n_g RT$

$$\Delta H-\Delta U=\Delta n_g RT=-\frac{1}{2}RT$$

72. Answer (3)

$[NiCl_4]^{2-}$ is sp^3 hybridised. The complex has 2 unpaired electrons.

73. Answer (2)

Ammonium acetate is a salt of weak acid and weak base whose pH can be calculated as.

$$pH=7+\frac{1}{2}(pK_a-pK_b)$$

$$=7+\frac{1}{2}(4.77-4.75)$$

$$=7+\frac{1}{2}\times 0.02$$

= 7 + 0.01 = 7.01

74. Answer (2)

Moles of urea = $\frac{6.02\times10^2}{6.02\times10^{23}}=10^{-2}$ moles.

Molarity = $\frac{10^{-2}\text{ mol}}{100\text{ mL}}\times\frac{1000\text{ mL}}{1\text{L}}=10^{-1}\text{ M}=0.1\text{ M}$

75. Answer (1)

In stock notation, the oxidation number is expressed by putting a Roman numeral representing the oxidation number in parenthesis after the symbol of metal in its molecular formula.

76. Answer (3)

For potassium

$1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,4s^1$

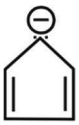
For $4s^1$

n = 4, ℓ = 0, m = 0, $s=\pm\frac{1}{2}$

77. Answer (2)

H_3BO_3 is a lewis acid.

78. Answer (1)

Conjugate base of  is aromatic; 

79. Answer (1)

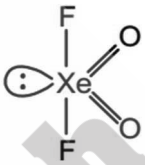
$P_A = P°_A X_A \Rightarrow P_A=\frac{2}{5}\times100=40$ mmHg

$P_B=\frac{3}{5}\times300=180$ mmHg

Mole fraction of A in vapour phase (Y_A)

$$=\frac{40}{40+180}=\frac{40}{220}=\frac{2}{11}$$

80. Answer (3)



See-saw structure.

81. Answer (2)

It is Markovnikov addition of water without rearrangement.

82. Answer (2)

	Cations	Colour of flame observed by naked eye
(a)	Cu^{2+}	Green flame with blue centre
(b)	Sr^{2+}	Crimson red
(c)	Ba^{2+}	Apple green
(d)	Ca^{2+}	Brick red

83. Answer (3)

$6Fe^{2+} + Cr_2O_7^{2-} + 14H^+ \longrightarrow 2Cr^{3+} + 7H_2O + 6Fe^{3+}$

84. Answer (3)

$\ddot{N}HCOCH_3$ is ortho/para directing group due to lone pair of nitrogen.

85. Answer (4)

As $\pi_1 = \pi_2$

$\therefore\ C_1 = C_2$

$$\frac{5}{342}=\frac{1}{M}$$

$$\therefore\ M=\frac{342}{5}=68.4\text{ g}$$

86. Answer (1)

Gabriel synthesis is used for preparation of aliphatic primary amines.

87. Answer (3)

Since reference state of carbon is graphite therefore ΔH_f° of graphite is zero.

88. Answer (3)

$\therefore$ No. of moles = $\frac{10}{20} = 1/2$

$\therefore$ No. of molecules = $\frac{N_A}{2}$

$\therefore$ No. of electrons = $10 \times \frac{N_A}{2}$

= 5 N_A

89. Answer (4)

1st order reaction,

$Kt = 2.303 \log \frac{[A]_0}{[A]_t}$

$\Rightarrow 2\times10^{-2} \times t = 2.303 \log\left(\frac{80}{20}\right)$

$t = \frac{2.303}{2\times10^{-2}} \log 2^2 = \frac{2\times2.303\times\log 2}{2\times10^{-2}} = 69.3$ s

90. Answer (4)

- $CHCl_3$ is oxidised to phosgene.
- DDT is used as insecticide.
- The chlorofluorocarbon compounds of methane and ethane are collectively known as freons.

BOTANY

91. Answer (1)

Because of the rule of base pairing and complementarity, both the nucleic acids (DNA and RNA) have the ability to direct their duplications.

92. Answer (3)

The papilionaceous corolla is characteristic feature of members of Fabaceae family.

In members of Fabaceae family, flowers show bilateral symmetry.

93. Answer (1)

Stratification represents the structural aspect of an ecosystem.

94. Answer (4)

Predators also help in maintaining species diversity in a community, by reducing the intensity of competition among competing prey species.

95. Answer (2)

According to Species-Area relationships proposed by Alexander von Humboldt, the relation between species richness and area for a wide variety of taxa turns out to be a rectangular hyperbola.

96. Answer (2)

According to the Red list (2004), thylacine got extinct from Australia

97. Answer (4)

Humus is highly resistant to microbial action.

98. Answer (1)

Trichoderma are effective biocontrol agents against several plant pathogens.

99. Answer (2)

Chromosome Y has the fewest number of genes (231).

100. Answer (1)

Stop codons do not have specific t-RNA for them.

101. Answer (3)

Sickle-cell anaemia is an autosomal recessive disorder in which substitution (transversion) mutation occurs in the gene controlling β-chain of haemoglobin.

102. Answer (3)

Slime moulds form an aggregation called plasmodium in favourable conditions. Their spores have cellulosic cell walls.

103. Answer (2)

Pteridophytes are first group showing events precursor to seed habit.

104. Answer (2)

Due to absence of cambium, monocot roots lack secondary growth.

105. Answer (4)

Integral proteins run throughout the lipid bilayer and requires crude methods of treatment like detergents for their removal.

106. Answer (3)

- Bivalent formation – Zygotene
- Dissolution of synaptonemal complex – Diplotene
- Terminalisation of Chiasmata – Diakinesis
- Exchange of Genetic segments – Pachytene

107. Answer (4)

Each ovule has one or two protective envelops called integuments.

108. Answer (2)

Drosophila melanogaster is suitable as experimental model because it produces hundreds of offspring by single mating with high degree of genetic variations, possess by four pair of chromosomes

109. Answer (3)

Orchid growing on mango branch as epiphyte is an example of commensalism, which is a (+, 0) relation, where neither of the interacting species get harmed.

110. Answer (1)

Wheat belongs to family Poaceae. *Solanum* is a genera. Sapindales is order. Anacardiaceae is a family of mango.

111. Answer (4)

Cleistogamous flowers are invariably autogamous as there is no chance of cross-pollen landing on the stigma.

112. Answer (3)

In pea seeds, if starch grain size is considered as the phenotype, the alleles show incomplete dominance.

113. Answer (1)

Morgan worked with the tiny fruit flies, *Drosophila melanogaster* to verify chromosomal theory of inheritance.

114. Answer (4)

In the grass family, the cotyledon is called Scutellum.

115. Answer (2)

Ethylene promotes female flowers.

116. Answer (1)

Mathematically, arithmetic growth can be enumerated by $L_t = L_o + rt$

117. Answer (2)

In mitochondrial matrix, complex IV refers to cytochrome *c* oxidase complex.

118. Answer (2)

Carboxylation is the most crucial step of the Calvin cycle.

119. Answer (3)

In animal cells, during the S-phase, centrioles duplicate in the cytoplasm.

120. Answer (2)

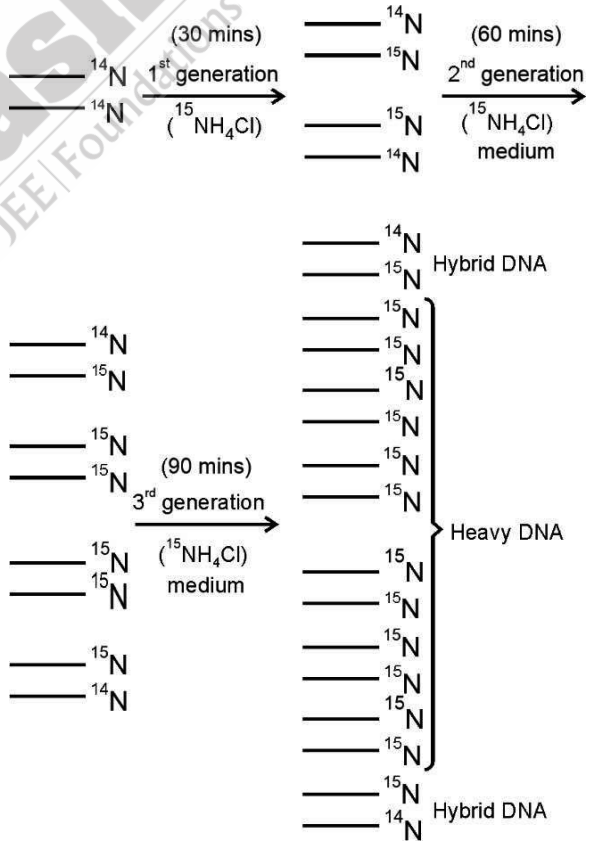
During Anaphase, centromeres split and chromatids separate.

121. Answer (1)

Bacterium replicates in 30 mins.

When allowed to grow in medium ^{14}N for many generations, as a result ^{14}N was incorporated into newly synthesised DNA,

Then transferred to the medium containing $^{15}NH_4Cl$,



Light DNA = 0%

Hybrid DNA = 25%

Heavy DNA = 75%

122. Answer (2)

According to Chargaff's rule,

Equimolar concentration of A = T and G = C

A = T = 30

A + T = 30 + 30 = 60%

Thus G + C amount is 40% with 20% C and 20% G

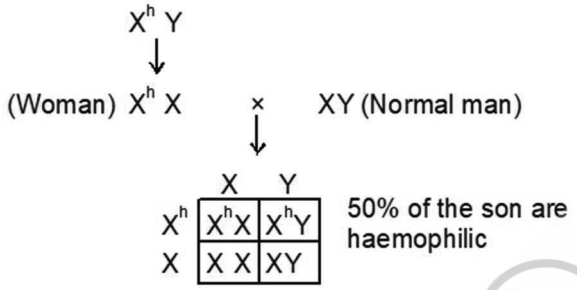
So, A = 30%

C = 20%

123. Answer (1)

Myotonic dystrophy phenylketonuria, thalassemia and sickle cell anaemia are autosomal disorders.

124. Answer (1)



125. Answer (3)

Cyclosporin A is the immunosuppressive agent produced by *Trichoderma polysporum*

126. Answer (2)

Telocentric chromosome has a terminal centromere.

127. Answer (2)

All tissues on the inner side of the endodermis such as pericycle, vascular bundles and pith constitute the stele.

128. Answer (4)

Whorled phyllotaxy can be observed in *Alstonia.*

129. Answer (3)

Marchantia is an example of liverwort.

130. Answer (1)

Trypanosoma is the causative agent of sleeping sickness.

131. Answer (2)

Alternaria belongs to Deuteromycetes.

They have septate, branched hyphae. Conidia (non motile exogenous) is produced as asexual spores.

132. Answer (3)

- Phycoerythrin imparts red colour
- Cell wall of brown algae contains algin
- Reserve material of brown algae is Mannitol or laminarin

133. Answer (2)

Offset → *Eichhornia*

Stolon → Mint

Runners → *Oxalis*

134. Answer (2)

In cymose inflorescence the flowers are borne in a basipetal order.

135. Answer (3)

Endarch xylem is found in both dicot and monocot stems.

ZOOLOGY

136. Answer (4)

Simple epithelium is composed of a single layer of cells. These are present in the walls of blood vessels, air sacs of lungs and in ducts of glands and tubular parts of nephrons. The inner lining of ducts of salivary glands is lined by compound epithelium.

137. Answer (1)

Sexes are separate and fertilisation is usually internal in the members of class Chondrichthyes.

Cycloid scales are characteristic of bony fishes.

138. Answer (3)

All connective tissues, except blood and lymph have cells that secrete fibres of structural proteins called collagen or elastin.

139. Answer (2)

Chikungunya is caused by Chikungunya virus. It is a vector-borne disease.

140. Answer (1)

In male frogs, urinary bladder and urinogenital ducts open into cloaca directly. Vasa efferentia are 10-12 in number that arise from testes. They enter the kidney on their side and open into Bidder's canal.

141. Answer (3)

The smaller the DNA fragment size, the farther it moves away from cathode. The separated DNA fragments can be visualised only after staining the DNA with ethidium bromide, followed by exposure to UV radiation.

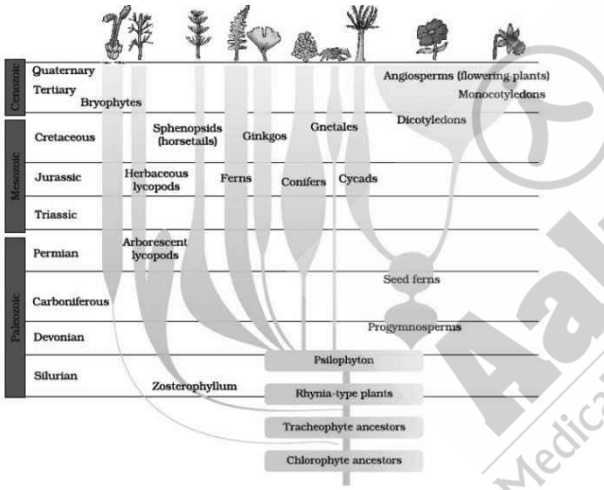
142. Answer (2)

The respiratory system of *Periplaneta* consists of a network of trachea, that open through 10 pairs of small holes called spiracles present on the lateral side of the body.

143. Answer (3)

In *Periplaneta americana*, a ring of 6-8 blind tubules called hepatic caeca is present at the junction of foregut and midgut, which secrete digestive juice. Gizzard is the posterior most part of foregut.

144. Answer (4)



145. Answer (3)

The correct sequence of events during muscle contraction is:

(1) Release of acetylcholine at neuromuscular junction

(2) Release of Ca^{2+} into sarcoplasm

(3) Actin – myosin complex formation

(4) Sliding of actin filaments over myosin filaments

146. Answer (2)

Nucleosides are formed of nitrogenous base and pentose sugar. Guanosine, adenosine and uridine are nucleosides while cytosine is a nitrogenous base of pyrimidine group.

147. Answer (3)

Glucocorticoids stimulate gluconeogenesis, lipolysis and proteolysis.

148. Answer (3)

The pathogens of dengue, chikungunya and filariasis are transmitted by female mosquitoes. Mosquitoes are arthropods. Ascariasis is transmitted through faeco-oral route.

149. Answer (4)

Antedon – Sea lily

Echinus – Sea urchin

150. Answer (3)

Among vertebrates, fishes respire through gills. Amphibians, reptiles, birds and mammals respire through lungs.

151. Answer (2)

Coitus interruptus, periodic abstinence and lactational amenorrhoea are natural methods of contraception.

Diaphragms, cervical caps and vaults are the barrier methods of contraception.

152. Answer (2)

Pneumotaxic centre present in pons region of hindbrain can moderate the functions of respiratory rhythm centre.

153. Answer (1)

LH surge causes ovulation. Spermatogenesis starts at puberty due to significant increase in GnRH.

154. Answer (3)

Atria are two relatively smaller upper chambers. Inter-atrial septum is a thin muscular wall. Atrio-ventricular septum is a thick fibrous tissue.

155. Answer (2)

Zwitterionic form would always have equal number of positive and negative charges.

$H_3^+N-\underset{\displaystyle R}{\underset{|}{C}}H-COO^-$ is a zwitterionic form

156. Answer (2)

Spermiogenesis is the process by which spermatids are transformed into spermatozoa. The release of sperms from seminiferous tubules is called spermiation.

157. Answer (2)

Reptiles have dry and cornified skin, epidermal scales or scutes. Amphibians have moist skin.

158. Answer (2)

All facial bones, except mandible and vomer are paired bones. Total number of facial bones in humans is 14.

159. Answer (3)

Glottis is the opening of trachea through larynx.

Epiglottis is a cartilaginous fold which covers the glottis during food swallowing.

160. Answer (3)

The hypothalamus contains several groups of neurosecretory cells which secrete hormones called hypothalamic hormones. Hypophyseal hormones are secreted by pituitary gland.

161. Answer (1)

The cardiac output is the amount of blood pumped out by each ventricle/min. The body has the ability to alter the stroke volume as well as the heart rate and thereby the cardiac output.

162. Answer (2)

The medulla oblongata contains centres which control respiration, cardiovascular reflexes and gastric secretions. Expression of emotional reactions are regulated by limbic lobe alongwith hypothalamus.

163. Answer (3)

Glomerular filtration rate in a normal healthy individual is 125 mL/min.

164. Answer (4)

Tobacco has been used by human beings for more than 400 years. Tobacco contains nicotine which is an alkaloid. Nicotine stimulates adrenal medulla to release adrenaline and nor adrenaline.

165. Answer (3)

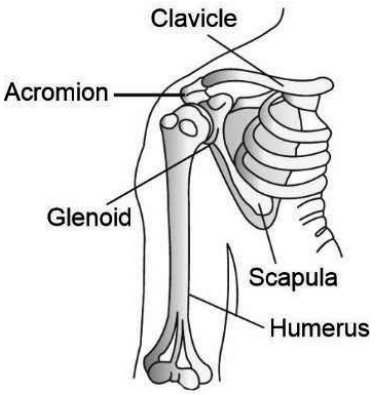
Lungs remove large amount of CO_2 while sweat removes salt, urea and lactic acid.

166. Answer (3)

Thyroxine is a non-proteinaceous hormone secreted by the thyroid gland. It interacts with intracellular receptors and mostly regulates gene expression. Thyroxine is chemically iodothyronine.

167. Answer (3)

Clavicle articulates with acromion process.



168. Answer (4)

Glucagon reduces the cellular glucose uptake and utilisation while insulin enhances cellular glucose uptake and utilisation.

169. Answer (4)

The cerebral cortex contains motor area, sensory area and large regions called the association areas responsible for complex functions like intersensory association, memory and communication.

170. Answer (2)

Bulbourethral glands and seminal vesicles are paired male accessory glands but prostate gland is unpaired male accessory gland. Vas deferens is a paired male sex accessory duct.

171. Answer (4)

In disruptive selection, extremes are selected by nature.

Genetic drift happens by chance (Founder effect)

Co-evolution is related with evolution of predator with prey.

172. Answer (3)

Heart failure is the state of heart when it is not pumping blood effectively enough to meet the needs of the body.

When the heart stops beating, it is called cardiac arrest.

When the heart muscle is suddenly damaged by an inadequate blood supply, it is called heart attack.

173. Answer (3)

The *ori* is a sequence of genes where replication begins, enabling a plasmid to reproduce itself as it must survive within cells.

174. Answer (4)

A rapid decline in the number of people in reproducible age can decrease the population growth rate of humans. A rapid decline in death rate, MMR, IMR as well as an increase in number of people in reproducible age are probable reasons for increase in population growth rate of humans.

175. Answer (3)

Foetal ejection reflex triggers the maternal pituitary to release oxytocin. Receptors for oxytocin are situated in the myometrium. It acts on uterine muscle fibres for forceful contractions to induce labor pain.

176. Answer (3)

Steroidal oral contraceptive pills, implants and injections exhibit similar mode of action as they all are preparation of either progestogen alone or progestogen-estrogen combination. Saheli is a non-steroidal pill and block estrogen receptors and thereby prevent implantation.

177. Answer (4)

B-lymphocytes are responsible for humoral immunity and T-lymphocytes for CMI (Cell mediated immunity).

178. Answer (2)

Somatostatin from hypothalamus inhibits the release of growth hormone from pituitary gland, whose hypersecretion cause acromegaly in middle age humans.

179. Answer (2)

When similar organisms evolve into different species due to different external factors, such type of evolution is termed as adaptive radiation or divergent evolution.

180. Answer (2)

Breast enlargement is one of the side-effects of use of anabolic steroids in human males.

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