PACE-IIT & MEDICAL

ANSWER KEY FOR MAJOR TEST- 04 (FOR 2023 ASPIRANTS) 29th May 2022

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

Solutions

1. Sol. Answer (2)

$v^2 + ax^2 = b$

$v^2 = b - ax^2$

$v^2 = a\left(\frac{b}{a} - x^2\right)$

Comparing it to equation

$v^2 = \omega^2(A^2 - x^2)$

$\omega = \sqrt{a}$

$f = \frac{\omega}{2\pi} = \frac{\sqrt{a}}{2\pi}$

2. Sol. (1)

The percentage error is $\frac{\Delta L}{L} \times 100\% = \frac{0.001}{0.802} \times 100\% = 0.125\%$

3. Sol. Answer (3)

T = 8s $\qquad \omega = \frac{2\pi}{8} = \frac{\pi}{4}$

$x_1 = A\sin\frac{\pi}{4} = \frac{A}{\sqrt{2}}$

$x_2 = A\sin\frac{\pi}{4} \times 2 - A\sin\frac{\pi}{4} = A - \frac{A}{\sqrt{2}} = \frac{A}{\sqrt{2}}\left(\sqrt{2} - 1\right)$

$\frac{x_1}{x_2} = \frac{1}{\sqrt{2}-1} \times \frac{\sqrt{2}+1}{\sqrt{2}+1} = \sqrt{2}+1$

4. Sol. (4)

Dimension of $\frac{W}{q} = \left[ML^2A^{-1}T^{-3}\right]$

Which is different from dimension of force $\left[MLT^{-2}\right]$

5. Sol. (1)

$F \propto v \Rightarrow F = bv \Rightarrow b = \frac{F}{v} = \frac{kgms^{-2}}{ms^{-1}} = kgs^{-1}$

6. Sol. (1)

$x = t^2 - 4t + 6$

$\frac{dx}{dt} = 2t - 4$

At $t = 2$, particle is at rest and reverse its position so,

$x\big|_{t=0} = 6m\Big]$

$x\big|_{t=2s} = 2m\Big]$ 1m

$x\big|_{t=3s} = 3m\Big]$

Distance $= (4+1)m = 5m$

Displacement $= 3m$

7. Sol. (4)

If velocity is changing they may change in magnitude or direction or both.

(i) So, if velocity is changing in direction only the magnitude is constant so speed is constant.

(ii) If only direction of velocity is changing and magnitude is constant then acceleration will also be Constant n magnitude (in case of uniform circular motion).

(iii) Average acceleration may be constant.

$$a_{av} = \frac{v_2 - v_1}{t_2 - t_1}$$

8. Sol. Answer (4)

At t = 0 the distance from 1 extreme is 2A

At $\omega t = \pi$ $\quad x = 0$

Hence by resulting values we can get equation for S.H.M.. from S.H.M.

9. Sol. (2)

$$d_s = \frac{u^2}{2a} \Rightarrow d_s \propto u^2$$

$u' = 2u$

$$\frac{d'}{d} = \frac{(2u)^2}{u^2}$$

$$\Rightarrow \frac{d'}{8} = 4$$

$$\Rightarrow d' = 32$$

10. Sol. (4)

If two vectors $\vec{A}$ and $\vec{B}$, $\perp$ to each other then, $\vec{A}.\vec{B} = 0$

$$\left(2\hat{i} + 3\hat{j} + p\hat{k}\right).\left(3\hat{i} - 8\hat{j} + 2\hat{k}\right) = 0$$

$$6 - 24 + 2p = 0$$

$$-18 + 2p = 0$$

$$p = 9$$

11. Sol. (1)

Method 1:

$\vec{V} = 3\hat{i} + 6x\hat{j}$

Also $\vec{V} = \frac{dx}{dt}\hat{i} + \frac{dy}{dt}\hat{j}$

$$\Rightarrow \frac{dx}{dt} = 3,$$

$$\int dx = \int 3dt$$

$x = 3t$

$$\frac{dy}{dx} = 6x$$

$$\int dy = \int 6 \times 3t dt$$

$$= 18\int t dt \Rightarrow 18 \times \frac{t^2}{2}$$

$$y = 9t^2$$

$$= 9 \times \frac{x^2}{9}$$

$$y = x^2$$

Method 2

$$V_x \hat{i} + V_y \hat{j} = \vec{V}$$

$$V_x = 3$$

$$V_y = 6x$$

We know

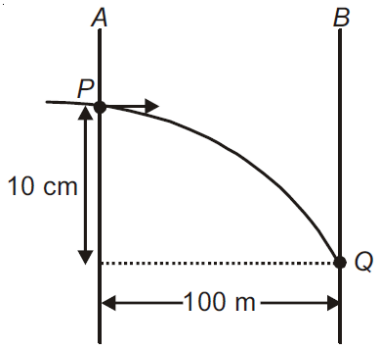
$$\frac{d_y}{d_x} = \tan\theta = \frac{V_y}{V_x}$$

$$\frac{d_y}{d_x} = \frac{6x}{3x}$$

$$\int_0 dy = \int_0 2x dx$$

$$y = x^2$$

12. Sol. (4)



$$10\,cm \Rightarrow 10 \times 10^{-2}\,m \Rightarrow 10^{-1} \Rightarrow 0.1m$$

It is a case of horizontal projectile.

So, $a_x = 0, u_x = 4, u_y = 0, a_y = -g$

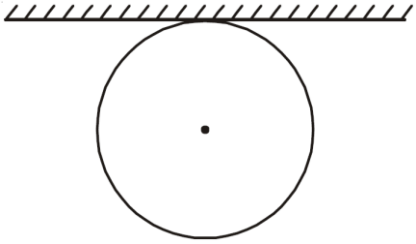
$$R = 100\,m, T = \sqrt{\frac{2H}{g}} \Rightarrow \text{Time of light } R = u_x T$$

$$100 = u\sqrt{\frac{2 \times 0.1}{100}} \Rightarrow \frac{u\sqrt{2}}{10} = 100$$

$$u = \frac{1000}{\sqrt{2}} \approx 707 ms^{-1}$$

13. Sol. Answer (4)

It is the case of a physical pendulum.



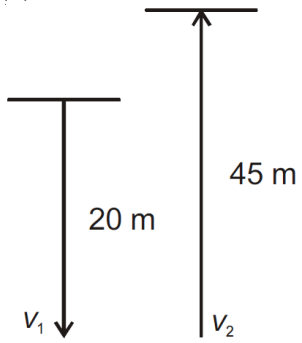
$$T = 2\pi\sqrt{\frac{I_{c.o.m.}}{mgL_{com}}}$$

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

$$L_{com} = R$$

$$T = 2\pi\sqrt{\frac{3R}{2g}}$$

14. (3)



Using $v^2 = u^2 + 2as$

$$v_1 = \sqrt{2g(20)} = 20 m/s$$

$$v_2 = \sqrt{2g(45)} = 30 m/s$$

$$\text{Impulse} = F\Delta t = m\left(\vec{v}_2 - \vec{v}_1\right)$$

$$\Rightarrow 200t = \frac{50}{1000}\left(20 - (-30)\right)$$

$$t = \frac{5}{400} = \frac{1}{80}s$$

15. Sol. (4)

(1) Action and reaction act on the different bodies.
(2) Example : Gravitational force, coulomb force
(3) 3rd law is irrespective of the state of motion

16. Sol. (3)

Total change in momentum $= \int F.dt =$ Area under Ft curve

Area above t-axis will be positive and below t-axis will be negative in option(3)

$$\text{Area} = -\left[\frac{1}{2}\times 5\times 1\right] + \frac{1}{2}\times 5\times 1 = 0$$

17. Sol. (2)

For $8kg\ T' = 8a_1$ .....(i)

For $4kg$

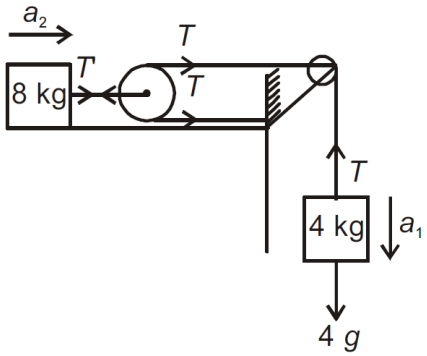
$4g - T = 4a_2$ .....(ii)

For pulley

$T' = 2T$ .....(iii)

Using (i), (ii) and (iii)

$a_2 = \frac{a_1}{2}$



18. (2)

19. (3)

$\tan\theta = \frac{v^2}{rg}$

$= \frac{14\times14\times3}{20\sqrt{3}\times10} \simeq \sqrt{3}$

20. (3)

$a_A = g\sin\theta$

$a_B = \frac{v^2}{R} = \frac{2gh}{R} = \frac{2gR(1-\cos\theta)}{R}$

Given, $a_A = a_B$

$\therefore \quad \sin\theta = 2 - 2\cos\theta$

Squaring these two equations we have,

$\sin 2\theta = 4 + 4\cos^2\theta - 8\cos\theta$

$\text{or} 1 - \cos^2\theta = 4 + 4\cos^2\theta - 8\cos\theta$

On solving this equation, we get

$\cos\theta = \frac{3}{5}$ or $\theta = \cos^{-1}(3/5)$

21. Sol. Answer (4)

Let initial length be l_1

Final length $l_2 = l_1 \times \frac{144}{100}$

$T_1 = 2\pi\sqrt{\frac{l_1}{g}}$

$$T_2 = 2\pi\sqrt{\frac{l_1}{g}\times\frac{144}{100}}$$

or $T_2 = 1.2T_1$

$T_1 = 60s$

So $T_2 = 72s$

22. Sol. (3)

The tension in the spring will be the reading of dynamometer

$F_{ext} = Ma$

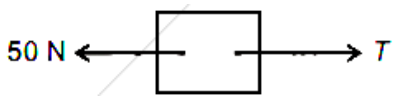
$50 - 30 = 10(a)$

$a = 2m/s^2$

For 6 kg block

$50 - T = 6(2)$

$T = 38N$



23. Sol. (1)

$W_{total} = W_{frition} + W_{gravity}$

$-250 = W_f - 50(4)$

$W_f = -50J$

24. (4)

$x = \frac{t^2}{3} \Rightarrow v = \frac{2t}{3}$

$W = \Delta K.E. = \frac{1}{2}(2)\left[\left(\frac{4}{3}\right)^2 - 0\right]$

$= \frac{16}{9}J$

25. Sol. (4)

$U = \frac{1}{2}k(1)^2 = \frac{k}{2}$

$U^1 = \frac{1}{2}k(4)^2 = \frac{1}{2}k(16) = 16U$

$\Delta U = U^1 - U = 16U - U = 15U$

26. Sol. (4)

$F.dx = dK$

$\frac{dK}{dx} = F$

$\Rightarrow$ slop of $K - x$ curve gives force

So slope is max at D, hence acceleration is maximum at D

27. Sol. (1)

$$P = \frac{dk}{dt} = \frac{d}{dt}\left[\frac{1}{2}mv^2\right]$$

$$= \frac{1}{2}v^2\frac{dm}{dt} = \frac{PAv^3}{2}$$

28. Sol. Answer (4)

Total distance covered by particle = 4A

For $\frac{5}{8}$ of oscillation means that it has completed $\frac{1}{2}$ the oscillation taking $\frac{T}{2}$ seconds. Now it has to cover $\frac{1}{8}$ oscillation more. The whole path may be divided into 8 parts of $\frac{A}{2}$ hence it has to travel $\frac{A}{2}$ distance from mean position.

$$\frac{A}{2} = A\sin\omega t$$

$$\frac{\pi}{6} = 8\omega t$$

$$t = \frac{T}{12} \qquad \left[\text{Putting}\,\omega = \frac{2\pi}{T}\right]$$

Total time = $\frac{T}{2} + \frac{T}{12} = \frac{7T}{12}$

29. Sol. (1)

$F = \frac{-dU}{dx} \Rightarrow$ slope of $U - x$ curve will represent force

From $0 \to x_1$ slope is positive and non zero

From $x_1 \to x_2$ Slope is zero

From $x_2 \to x_3$ Slope is negative and non zero

30. Sol. (2)

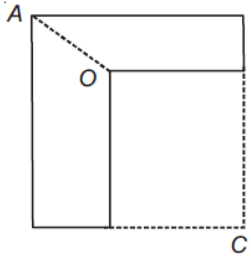
$$T - mg\cos\theta = \frac{mv^2}{R}$$

$\theta = 60^\circ$

Solving this $T = 1.56N$

31. Sol. (2)

Centre of mass will lie on the line of symmetry



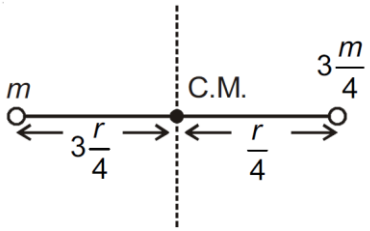
OA is the line of symmetry of the remaining part.

32. (3)

$$\frac{2}{3}mr_1^2 = \frac{2}{5}mr_2^2$$

$$\frac{r_1}{r_2}=\sqrt{\frac{3}{5}}$$

33. Sol. (2)



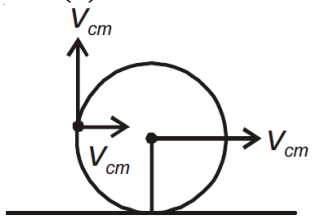
$$I=m\left(\frac{3r}{4}\right)^2+3m\left(\frac{r}{4}\right)^2$$

$$=\frac{3}{4}mr^2$$

34. Sol. (1)

Body of smaller $\frac{K^2}{R^2}$ will take less time so solid sphere will reach the ground first.

35. Sol. (2)



$$v_{net}=\sqrt{v_{cm}^2+v_{cm}^2}$$

$$=v_{cm}\sqrt{2}$$

36. Sol. (1)

$$\mu=\frac{I\tan\theta}{I+mr^2}=\frac{\frac{2}{5}mr^2\tan\theta}{\frac{2}{5}mr^2+mr^2}$$

$$=\frac{2\tan\theta}{7}$$

37. Sol. (4)

$$\ell=\pi r$$

$$r=\frac{I}{\pi}$$

$$I=2m\left(\frac{I}{\pi}\right)^2$$

$$=\frac{2mI^2}{\pi^2}$$

38. Sol. Answer (2)
A swing is like a pendulum. So

$$T = 2\pi\sqrt{\frac{l}{g}}$$

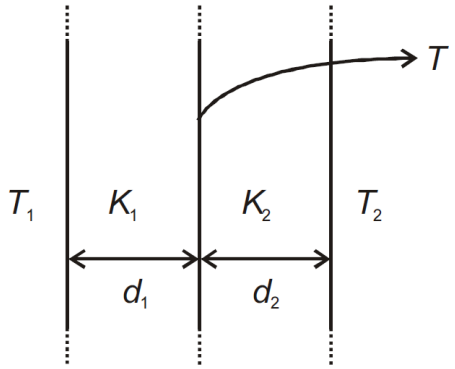
39. Sol. (2)
For cooking high conductivity and low specific heat because we do not want to waste heat energy in heating up the vessel it self also we want the vessel to absorb as much as heat is available

40. (2)
Heat flow across both the walls will be same

$$\frac{K_1 A}{d_1}(T - T_1) = \frac{K_2 A}{d_2}(T_2 - T)$$

$$K_1 T d_2 - K_1 T_1 d_2 = K_2 T_2 d_1 - K_2 T d_1$$

$$T = \frac{K_1 T_1 d_2 + K_2 T_2 d_1}{K_1 d_2 + K_2 d_1}$$



41. Sol. (4)
On the sides heating is only due to Radiation but over the top heating is due to Radiation as well as convection

42. (2)

$$\ln\left(\frac{T_f - T_0}{T - T_0}\right) = Kt$$

If θ is the instantaneous temperature than

$$\ln\left(\frac{\theta_i - \theta_0}{\theta - \theta_0}\right) = Kt$$

$$\ln(\theta_1 - \theta_0) - \ln(\theta - \theta_0) = KT$$

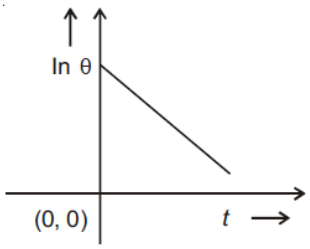
$$\ln(\theta - \theta_0) = -Kt + \ln(\theta_i - \theta_0)$$

$\left\{\begin{array}{c} \theta_i \longrightarrow \text{initial temperature} \\ \theta_0 \longrightarrow \text{temperature of surrounding} \end{array}\right\}$

Comparing to

$y = mx + C$

We get a negative slope, so graph will be a straight line with decreasing slope.



43. Sol. (2)

Solar constant $\propto T^4$ $\left[\because S = \left[\frac{R}{r}\right]^2 \sigma T^4\right]$

$\frac{\Delta S}{S} = \frac{4\Delta T}{T}$

and $\frac{\Delta T}{T} = -1\%$ [given]

So $\frac{\Delta S}{S} = -4\%$

44. Sol. (4)

$\because PV^{\gamma} = \text{constant}$ So, $P \propto V^{-\gamma}$

Then, $\frac{\Delta P}{P} = \gamma\left(\frac{dV}{V}\right)$

45. (4)

Cylinder A	Cylinder B
Free piston i.e, at constant pressure	Fixed piston i.e, at constant volume

$\Delta Q = \Delta U$

$nC_P\Delta T = nC_V\Delta T'$

$C_P T_0 = C_V(\Delta T)'$

$\Delta T' = \frac{C_P}{C_V}T_0 = \gamma T_0 = \frac{5}{3}T_0$

46. Sol. (2)

$TV^{\gamma-1} = \text{constant}$

$T_1V_1^{\gamma-1} = T_2V_2^{\gamma-1}$

$T_2 = T_1\left(\frac{V_1}{V_2}\right)^{\gamma-1}$

$T_2 = (273K)\left[\frac{V_1}{V/9}\right]^{1.5-1}$

$T_2 = (273K)\times 3$

$= 819K$

$= 546^{\circ}C$

47. Sol. (1)

$$V_0 = k\frac{T_0}{P_0}$$

$$4V_0 = 4k\frac{T_0}{P_0}$$

$$= k \times \frac{2T_0}{P_0/2}$$

$\therefore$ Temperature is doubled and pressure halved.

48. Sol. (4)

$$\text{R.M.S speed} = \sqrt{\frac{v_1^2 + v_2^2 + v_3^2 ..... v_n^2}{n}}$$

$$\bar{v} = \sqrt{\frac{1^2 + 2^2 + 3^2 + 4^2}{4}}$$

$$\bar{v} = \sqrt{\frac{30}{4}}$$

$$\bar{v} = \sqrt{\frac{15}{2}}$$

49. Sol. (4)
The Maxwell's speed distribution is asymmetric due to the fact that the lowest speed possible is zero. While the highest speed possible is infinity.

50. Sol. (4)
All the above definition are true.
Hence answer is (4)

Ans 51 $P_A M_A = d_A RT$

$P_B M_B = d_B RT$

$\frac{P_A}{P_B}\frac{M_A}{M_B} = \frac{d_A}{d_B} \Rightarrow \frac{P_A}{P_B} = 2 \times 2 = 4:1$

52) $P \times 0.44 = \frac{.2}{M_x} RT$

$P \times 0.32 = \frac{.1}{44} \times RT$

$\Rightarrow \frac{1}{5} = \frac{2 \times 44}{M_x} \Rightarrow M_x = 64$ gm/mole

53) $\Delta H_{ionisation} = 13.7 - 3.7 = 10$ kcal/mole

55) $\Delta H = T\Delta S \Rightarrow T_B = \frac{50 \times 1000}{110}$

$\Rightarrow T_B = 454.5$ K

57) $SO_3 \rightleftharpoons SO_2 + \frac{1}{2}O_2$

t=0	a mole	0	0
t=t eq	a-x	x	$\frac{x}{2}$

$$60 = \frac{80a}{a + \frac{x}{2}} \Rightarrow \frac{4}{3} = 1 + \frac{x}{2a}$$

$$\Rightarrow \frac{x}{2a} = \frac{1}{3} \Rightarrow \frac{x}{a} = \frac{2}{3} = .66$$

58) Greater the common ion, least is the solubility

59) $Ba(OH)_2 \rightleftharpoons \underset{s}{Ba^{+2}} + \underset{2s}{2OH^-}$

$[OH^-] = 2s = 10^{-2}$

$\Rightarrow Ksp = 4s^3 = 4 \times \frac{10^{-6}}{8} = \frac{1}{2} \times 10^{-6}$

$= 5 \times 10^{-7}$

62) $M = \frac{10pd}{M'} = \frac{10 \times 80 \times 1.73}{98}$

63) n factor of $KMnO_4 = 5$

Eq = mol/5 = 31.6

65) $Cu_2^{+1}H \longrightarrow 2Cu^{+2} + 2e$

$S^{-2} \longrightarrow S^{+4} + 4e$

n factor = 8

66) $[H^+] = 10^{-5}$, mmole of $H^+ = 10 \times 10^{-5}$

$= 10^{-3}$

$[OH] = 10^{-4}$, mmole of $\bar{O}H = 10^{-4}$

$H^+ + \bar{O}H \rightarrow H_2O$, $[H^+)$ mmole left in 200 ml soln

$10^{-3} \quad 10^{-4}$

$= 10^{-3} - 10^{-4}$

$= 10^{-3}\left(\frac{9}{10}\right)$

$\therefore$ $[H^+)$ mmole in 20 ml $= 9 \times 10^{-5}$

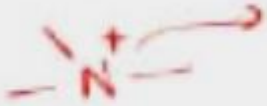
$\therefore$ $\bar{O}H$ required mmole $= 9 \times 10^{-5}$

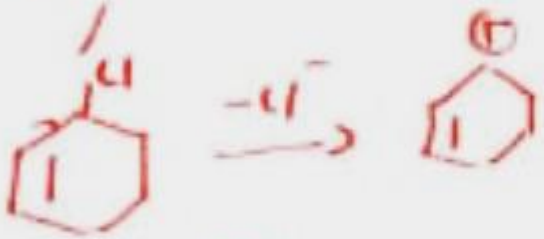
Volume $= \frac{9 \times 10^{-5}}{x} \times 100$ ml

$= 9 \times 10^{-3}$ ml

67) d orbital resonance in S

69)  → aromatic

70)  → does not have a vacant orbital

71)  most stable carbocation

72)  3 chiral centres

74) $10.10 = \frac{10P + 11(100-P)}{100}$

77) $v \propto \frac{Z}{n}$

$r \cdot mvr = h^2 = 10^{-11}$

78)  ⇒ non bonding

80) no. of eq of HNO_3 = no. of eq of Fe^{+2}

$3 \times 3 \times V_{HNO_3}(L) = \frac{8}{56} \times 1$ ← nf of Fe^{+2}

↓ ↓

nf M

$\Rightarrow V_{HNO_3} = \frac{1}{63} L =$

88) $[Mg^{++}]$ 10...

$[OH^-]^2 = \frac{10^{-11}}{} \times 10 = 10^{-10}$

$\Rightarrow [OH^-] = 10^{-5}$

$pOH = 5, \quad pH = 9$

89) $pH = pK_a$ at 50% neutralisation

$pH = 7 + \frac{1}{2}(pKa + \lg \frac{.01}{2})$

90) $3x = 228$ $\quad p-H \to x$

$4x + y = 355$ $\quad p-p \to y$

91) ^-OH is a weaker base cannot displace $^-NH_2$ a stronger base

92) $H-C \equiv C^- \longrightarrow$ sp hybridised least basic

100) $h\nu = x + h\nu_0$

$h\,2\nu = 4x + h\nu_0$

101. (3)
XI NCERT Pg 243

102. (2)
$6\text{Turns} = 60\text{bp}$

$\text{AT} = 22\text{bp}$

$\therefore \text{GC} = 38\text{bp}$

$\therefore \text{G} = \text{C} = 38\text{bp}$

103. (1)
XII NCERT Pg 38

104. (3)
(i) B has $\downarrow \psi_w$

(ii) B has $\downarrow \psi_s$

(iii) Osmosis will occur from $\text{A} \rightarrow \text{B}$

(iv) At equilibrium both will have same water potential

105. (1)
XII NCERT Pg 120

106. (3)
XI NCERT Pg 168

107. (2)
DPD = OP – TP

$\therefore$ DPD (A) = 10 – 4 = 6

DPD (B) = 4 – 4 = 0

DPD (C) = 10 – 5 = 5

Water flows from low DPD to high

$\therefore$ B to A, C, D

108. (1)
XII NCERT Pg 117

109. (3)
Meiotic division, $\frac{5}{4} \times 100\,\text{grains} = 125$

110. (3)
Codon with all 3 bases same: AAA, UUU, GGG, CCC

111. (1)
XI NCERT Pg 232, 234

112. (1)
XI NCERT Pg 179

113. (3)
1 Turn = 10 bp
n Turn = 45000 bp
$\therefore n = \frac{45000}{10}$
$= 4500$

114. (2)
XII NCERT Pg 26

115. (1)
XI NCERT Pg 179

116. (3)
XII NCERT Pg 105

117. (1)
XII NCERT Pg 11 & 12

118. (2)
XII NCERT Pg 114

119. (2)
XI NCERT Pg 179

120. (1)
XI NCERT Pg 229

121. (2)
E. coli with radioactive DNA will be seen in first generation but in second generation only 50% bacteria will have one radioactive strand.

122. (3)
XII NCERT Pg 14

123. (4)
XII NCERT Pg 100

124. (4)
XII NCERT Pg 220

125. (1)
XII NCERT Pg 25

126. (4)
$\ell(\text{DNA}) = 6.8\text{nm}$
$\therefore$ Turns = 2
1 Turns = 10 bp
2 Turns = 20 bp
= 40 bases
Pentose = 40
N_2 base = 40
A = 20%

$= \frac{20}{100} \times 40$

$= 8$

$= 8$

$T = 8$

G = 12

C = 12

H_2 bond = $ATx2 + GCx2 = 3$

= 16 + 36

=52

127. (2)
XII NCERT Pg 32

128. (2)
XII NCERT Pg 112

129. (1)
XII NCERT Pg 34

130. (3)
XI NCERT Pg. 78

131. (4)
ATP molecules required to synthesize one glucose via C_4 = 30

132. (2)
$A + T = 45\%$

$\therefore G + C = 55\%$

$\therefore G = 27.5\%$

133. (4)
XI NCERT Pg 79,80,81

134. (2)
XII NCERT Pg 123

135. (1)
XI NCERT Pg. 94

136. (3)
XI NCERT Pg. 26

137. (4)
XII NCERT Pg 35

138. (4)
XI NCERT Pg 198 & 199

139. (1)
XI NCERT Pg 134

140. (1)
XII NCERT Pg 120

141. (3)
XI NCERT Pg 180

142. (3)
XII NCERT Pg 25

143. (3)
XI NCERT Pg 187

144. (2)
XII NCERT Pg 99

145. (3)
XII NCERT Pg 35

146. (3)
XI NCERT Pg 191

147. (2)
XII NCERT Pg 114

148. (4)
XI NCERT Pg 35

149. (1)
XI NCERT Pg 186

150. (4)
$1MMC = 4PG$
$\therefore 4MMC = 16PG$

151. (4)
XI, NCERT Chapt. 4, Both show organ system level of organization, bilateral symmetry and coelom.

152. (1)
Hormones secreted by ovary are – Oestrogen and progesterone- both steroids. Peptide hormones of ovary are activin, inhibin, relaxin etc.

153. (3)
Hormone are highly specific in action. They identify their target cell by membrane bound or intra cellular receptors.

154. (4)
NCERT XI pg 292

155. (3)
Frontal lobe of cerebrum of brain has area of intelligence, logical thinking, learning etc.

156. (1)
XI NCERT pg 321. Outer Cerebral cortex has grey matter and inner cerebral medulla has white matter. Same is for cerebellum .Spinal cord and medulla has outer white matter and inner grey matter.

157. (2)
XI, NCERT Chapt. 7, Page – 112

158. (4)
Autonomic nervous system controls and regulates the activities of involuntary organs i.e smooth and cardiac muscles , glands of body.

159. (2)
XI NCERT pg 340

160. (2)
XI NCERT pg 323,Nose in brief

161. (1)
XII NCERT pg 14, 2nd para. Statements (i) and (iv) are coorect.

162. (4)
XI NCERT pg 324, 3rd para.

163. (1)
XI NCERT pg 327. Movement in endolymph of scala media causes ripples in basilar membrane.

164. (2)
GH of pituitary is stimulated by GHRH of hypothalamus.

165. (2)
ADH is anti diuretic hormone i.e suppress excess water elimination in urine.

166. (1)
After birth, mother begins with period of lactation. PRL is milk secretory and oxytocin is milk ejaculatory hormone.

167. (1)
Hypersecretion of GH in adults results in acromegaly

168. (3)
PTH is hypercalcemic and TCT is hypocalcemic hormone.

169. (2)
XI NCERT pg 340,2nd para

170. (1)
Spermatogenesis can occur only at temperature 2-2.5 degree celsius less than body temperature , which can be created only in scrotum of males.

171. (4)
Sertoli cells are also called as nurse cells as they provide nourishment to cells formed in the developing stages of spermatogenesis.

172. (2)
XII NCERT pg 44, 2nd para .If male urethra is not neutralized, then sperms shall die due to its acidic pH. Sexual behavior is controlled by limbic system.

173. (2)
(XII NCERT) Pg. 51-53

174. (4)
Pregnancy Hormone Progesterone is produced by it.

175. (2)
XII NCERT pg 45

176. (4)
XI, NCERT Chapt. 16, Page – 259

177. (2)
Menstrual cycle stops during pregnancy as high level of progesterone (secreted by corpus luteum and placenta) inhibits gonadotropins. Hence ovulation too is suppressed as LH is inhibited.

178. (3)
XII NCERT pg 51, 1st para

179. (3)
In spermatogenesis, the phase of maturation involves Meiosis-I (that convert primary spermatocytes to secondary spermatocytes) and Meiosis-II (that converts secondary spermatocytes to spermatids).

180. (3)
XI, NCERT Chapt. 17, Page – 274

181. (2)
All except polar body are cells formed during spermatogenesis.

182. (3)
XII NCERT pg 6,7

183. (4)
XII NCERT pg 52, figure 3.11 With each cleavage size of blastomeres keep decreasing as there is no growth phase, nuclear content is doubled whereas cytoplasmic content is halved.

184. (1)
XII NCERT pg 52.

185. (4)
XII NCERT pg 9

186. (2)
(XI, NCERT Pg.103)

187. (3)
(XI, NCERT Pg. 285)

188. (2)
Mesovarium is peritoneum of Ovary and Mesometrium is peritoneum of uterus.

189. (3)
XI NCERT pg 336, last para

190. (4)
XII NCERT pg 49. 50 primary spermatocytes produces 100 secondary spermatocytes and eventually forms 200 spermatozoa

191. (2)
Corpus callosum is the transverse band of nerve fibers that connects both halves of cerebrum and hence coordinates both sides of body.

192. (4)
Chapt. 8, Other cells too have elastin and elongated shape. Only muscle cell has actin and myosin.

193. (1)
Pathetic or trochlear, occulomotor, abducens and hypoglossal are motor nerves and facial is a mixed nerve.

194. (3)
XI, NCERT Chapt. 9, Page – 147

195. (2)
Amphibians and Reptiles have 3 and incomplete 4 chambered heart respectively

196. (2)
On application of stimulus, Na channels are opened causing influx of Na making the membrane positive from inside., i.e causing depolarization.

197. (3)
XII NCERT pg 54

198. (2)
Sperm secretes enzymes to penetrate through ovum.

199. (3)
XII NCERT pg 9. Seasonal breeders reproduce in a particular season of the yearas they exhibit oestrous cycle . Non primates mammals show this cycle. Apes and monkeys are primates.

200. (3)
NCERT XI pg 320