ENTHUSIAST, LEADER & ACHIEVER COURSE

PHASE : ALL ENTHUSIAST, MLA, B, C, E, P, Q, R, S, T, U, V, MAZA, ZB, ZC, ZD, ZE, ZF, ZN, ZP, ZQ, ZR, ZV, ZX, ZY, ZK, MAPA, MAPB, MSP1, MSP2, LAKSHYA

TARGET : PRE-MEDICAL 2024

Test Type : **MAJOR** Test Pattern : **NEET (UG)**

TEST DATE : 04-04-2024

ANSWER KEY

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

HINT – SHEET

SUBJECT : CHEMISTRY

SECTION-A

1. Ans (4)

$2A + 3B \longrightarrow 4C$

$$ROR = \frac{ROD(A)}{2} = \frac{ROD(B)}{3} = \frac{ROA(C)}{4}$$

$$r = -\frac{1}{2}\frac{d[A]}{dt} = -\frac{1}{3}\frac{d[B]}{dt} = +\frac{1}{4}\frac{d[C]}{dt}$$

2. Ans (3)

From eq. II

$r = k[x]\,[y_2]$

From eq. I

$$K_{eq} = \frac{[x]^2}{[x_2]} \Rightarrow [x] = k_{eq}^{1/2}[x_2]^{1/2}$$

So $r = k\,K_{eq}^{1/2}[x_2]^{1/2}[y_2]$

Overall order = 1.5

3. Ans (2)

$t_{99.9\,\%} = 3t_{90\,\%}$

4. Ans (3)

$$2A \longrightarrow 2B + C$$

t = 0	2atm	0	0
t = 100s	2−2x	2x	x

total pressure = 2−2x + 2x + x

$2.5 = 2+x$

$x = 0.5$ atm

$$k = \frac{2.303}{t}\log\left(\frac{P_0}{P_0 - 2x}\right)$$

$$k = \frac{2.303}{100}\log\left(\frac{2}{2-2(0.5)}\right)$$

$$= \frac{2.303}{100}\log 2$$

$= 0.693 \times 10^{-2}$

$k = 6.93 \times 10^{-3}\ s^{-1}$

5. Ans (3)

NCERT-XII Part-I, Pg. # 112

6. Ans (2)

$G = \frac{1}{R} = \frac{1}{210}\text{ohm}^{-1}$

$\kappa = \frac{1}{R}\frac{\ell}{A} = \frac{1}{210} \times 0.84 = 4 \times 10^{-3}\text{ohm}^{-1}\text{cm}^{-1}$

$\lambda_{eq} = \frac{\kappa \times 1000}{N} = \frac{4 \times 10^{-3} \times 1000}{0.01}$

$= 400\text{ohm}^{-1}\text{cm}^2\text{eq}^{-1}$

$\lambda_m = \lambda_{eq} \times V_f = 400 \times 2 = 800\text{ohm}^{-1}\text{cm}^2\text{mol}^{-1}$

7. Ans (1)

$\Lambda^{\infty}_{eq}(BaSO_4) = \Lambda^{\infty}_{eq}(BaCl_2) + \Lambda^{\infty}_{eq}(H_2SO_4) - \Lambda^{\infty}_{eq}(HCl)$

$= x_1 + x_2 - x_3$

8. Ans (3)

Reducing power $\propto$ SOP

9. Ans (4)

$\Delta G^\circ = -nFE^\circ_{cell}$

$\Delta G^\circ = -nR\,\ell n\, K_{eq}$

$E^\circ_{cell} < 0;\ \Delta G^\circ > 0;\ K_{eq} < 1$

10. Ans (2)

$2Cr \longrightarrow 2Cr^{+3} + 6e^-;\ E^\circ = +0.74\ V$

$3Co^{+2} + 6e^- \longrightarrow 3Co;\ E^\circ = -0.28\ V$

$2Cr + 3Co^{+2} \longrightarrow 3Co + 2Cr^{+3}$

$E^\circ_{cell} = 0.46$

$E_{cell} = 0.46 - \frac{0.06}{6}\log\frac{(0.01)^2}{(0.01)^3}$

$= 0.46 - 0.01 \log 100$

$= 0.46 - 0.02$

$= 0.44\ V$

11. Ans (3)

$\frac{\text{wt of Al deposited}}{\text{wt of Cu deposited}} \Rightarrow \frac{\text{eq. wt of Al}}{\text{eq. wt of Cu}}$

$\frac{W(Al)}{6.35} \Rightarrow \frac{27/3}{63.5/2}$

$W(Al) = \frac{9 \times 2}{63.5} \times 6.35$

$= 1.8\ g$

12. Ans (1)

$\Delta T_f = ik_f m$

$= 2 \times 1.86 \times 0.5 = 1.86$

$T_f = -1.86°C$

13. Ans (1)

New concentration

$= \frac{25 \times 0.25}{500} = 0.0125M$

14. Ans (2)

$P_s = P°_A X_A + P°_B X_B$

$84 = 70 \times 0.8 + P°_B \times 0.2$

$P°_B = 140\ \text{torr}$

15. Ans (2)

Ethanol-acetone shows positive deviation

16. Ans (2)

$Ba(NO_3)_2 \longrightarrow Ba^{+2} + 2NO_3^-$

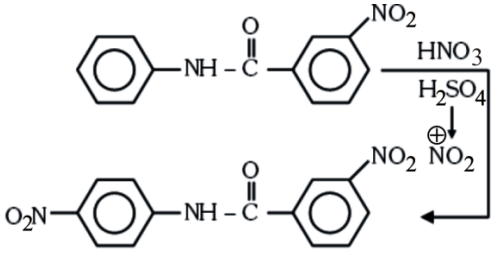
$i = 1 + 2\alpha$

$2.74 = 1 + 2\alpha \Rightarrow \alpha = 0.87 = 87\%$

17. Ans (1)

In titration of WA and SB, Hph is used as indicator.

20. Ans (2)



21. **Ans (2)**

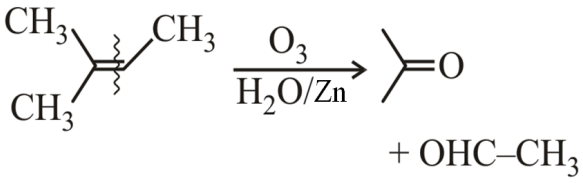
Addition of H, OH according M.K. rule

followed by tautomerisation.

22. **Ans (2)**

Rate of $E^2 \propto$ stability of alkene

23. **Ans (4)**



25. **Ans (2)**


is antiaromatic

27. **Ans (4)**

Fact base

29. **Ans (2)**

It will give combine test of sulphur and

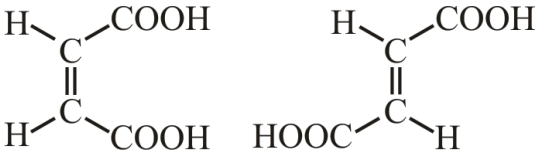
nitrogen to form $Fe(SCN)_2^{2+}$

30. **Ans (2)**

Gauche form is more stable than Anti due to

intramolecular hydrogen bonding.

31. **Ans (1)**

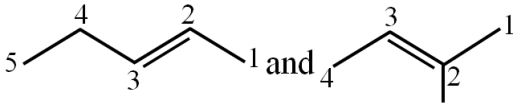

Mallic acid (Cis)

Fumaric acid (Trans)

32. **Ans (4)**

$$\text{Boiling Point} \propto \frac{1}{\text{Branching}}$$

33. **Ans (2)**



SECTION-B

36. **Ans (2)**

$$\frac{t_{\frac{7}{8}}}{t_{\frac{1}{2}}} = \frac{\frac{7}{8}}{\frac{1}{2}} = \frac{7}{4}$$

37. **Ans (1)**

$$\ell nk = \ell nA - \frac{Ea}{R}\left(\frac{1}{T}\right)$$

In ℓnk v/s $\frac{1}{T}$ graph

$$\text{Slope} = -\frac{Ea}{R}$$

$$-5 \times 10^3 = \frac{-Ea}{8.314}$$

$$E_a = 5 \times 10^3 \times 8.314$$

$$= 41500 \text{ J mol}^{-1} \text{ or } 41.5 \text{ kJ mol}^{-1}$$

38. **Ans (3)**

NCERT XII Pg. # 115, Edition - 2013

39. **Ans (2)**

NCERT-XII, Part-I, Pg # 45, Edition : 2017

40. **Ans (3)**

$$\text{Reactivity of metal} \propto \text{SOP} \propto \frac{1}{\text{SRP}}$$

$SRP(Cu^{+2}) > SRP(Fe^{+2})$

So

$Cu + Fe^{+2} \longrightarrow Cu^{+2} + Fe$

is not possible

41. **Ans (4)**

In 1 dm^3 = 10 g urea

In 100 mL = 1 g urea

In 100 mL = 5 g non-volatile solute

$$\frac{1}{60} = \frac{5}{M_w} \Rightarrow M_w = 300$$

42. **Ans (4)**

NCERT (2017), Part-I, Pg # 49

43. **Ans (1)**
Millimoles of KI must be greater than millimoles of $AgNO_3$ for selective adsorption of I^- ion.

45. **Ans (2)**
It is Anti addition

50. **Ans (2)**
$Fe_4[Fe(CN)_6]_3$
prussian blue

SUBJECT : BOTANY

SECTION-A

51. **Ans (3)**
NCERT-XI, Pg. # 228-233

52. **Ans (4)**
NCERT Pg. No. # 209

53. **Ans (2)**
NCERT-XI, Pg # 223

54. **Ans (3)**
NCERT Pg No. # 221

55. **Ans (1)**
NCERT XI, Page No. 218

56. **Ans (1)**
NCERT Pg. No.# 208

57. **Ans (2)**
NCERT-XI, Page No. # 218, 220

58. **Ans (1)**
NCERT Pg. # 231

59. **Ans (3)**
NCERT Pg. No. # 247, 248, 249, 250

60. **Ans (3)**
NCERT XI Pg. # 246, 247

61. **Ans (1)**
NCERT XII Pg. # 23, 26

62. **Ans (4)**
NCERT XII Pg. # 28

63. **Ans (3)**
NCERT Pg. No. # 76, 77

64. **Ans (2)**
NCERT-XI, Pg. 71

65. **Ans (1)**
NCERT XI, Pg. # 70

66. **Ans (1)**
NCERT Pg. No. # 230

67. **Ans (2)**
NCERT-XI, Pg # 232

68. **Ans (4)**
NCERT-XI, Pg. # 230

69. **Ans (1)**
NCERT-XI, Pg. # 231

70. **Ans (4)**
XI NCERT Pg. No. - 237

71. **Ans (3)**
NCERT, Pg. # 240, Para # 15.1

72. **Ans (3)**
NCERT XI Pg. No :- 252

73. **Ans (3)**
NCERT-XI, Pg. # 250

74. **Ans (3)**
NCERT (XII) Pg # 20(E), 24 (H)

75. **Ans (1)**
NCERT XII Pg. # 39

76. **Ans (3)**
NCERT-XII, Pg. # 25

77. **Ans (4)**
NCERT-XII, Pg. # 34

78. **Ans (3)**
NCERT, Pg. # 28, Para # 2.2.3

79. **Ans (1)**
NCERT Pg. No. # 77

80. **Ans (1)**
NCERT-XI, Pg. # 76

81. **Ans (4)**

NCERT (XI) Pg # 87

82. **Ans (4)**

NCERT, Pg. # 85

83. **Ans (4)**

NCERT Pg # 94

84. **Ans (3)**

NCERT-XI, Pg#86

85. **Ans (1)**

NCERT XI Pg. # 90

SECTION-B

86. **Ans (3)**

NCERT, Pg. # 223

87. **Ans (1)**

NCERT Pg. No. # 209

88. **Ans (2)**

NCERT-XI, Pg. # 209, 210, 211

89. **Ans (3)**

NCERT, Pg. # 233

90. **Ans (3)**

NCERT (XII) Pg # 24, 25

91. **Ans (2)**

NCERT, Pg. # 86, 87

92. **Ans (1)**

NCERT-XII, Pg. # 29, 31, 35

93. **Ans (3)**

NCERT XI Pg. No :- 248, 249, 250

94. **Ans (2)**

NCERT, Pg. # 247

95. **Ans (2)**

NCERT (XII) Pg # 23 (E), 24 (H)

96. **Ans (3)**

NCERT-XI, Pg. 71

97. **Ans (2)**

NCERT-XI, Pg. # 68

In cucumber apical bud is modified into tendril to protect from grazing animals.

98. **Ans (4)**

NCERT-XI, Pg. # 73

99. **Ans (2)**

NCERT Pg. #85

100. **Ans (3)**

NCERT-XI, Pg. # 93

SUBJECT : ZOOLOGY

SECTION-A

102. **Ans (1)**

NCERT Pg. # 315

103. **Ans (2)**

NCERT XI, Pg. # 321

106. **Ans (3)**

NCERT (XI) E Pg. # 316

113. **Ans (3)**

NCERT XI, Pg. # 335 to 336

114. **Ans (1)**

NCERT Pg. # 336

115. **Ans (4)**

Module-8, Pg # 136

119. **Ans (4)**

NCERT Pg.309

121. **Ans (4)**

NCERT Pg. # 308

126. Ans (3)

NCERT (XII) Pg. # 50, 51

131. Ans (3)

NCERT(XII) Pg#62/67(H) Para:4.3

132. Ans (1)

NCERT(XII) Pg#64/71(H) Para:4.5

133. Ans (4)

NCERT(XII) Pg#61/67(H) Para:4.2

134. Ans (4)

NCERT-XII, Pg. # 71 (H)

135. Ans (2)

NCERT (XII) Page # 64, Para 2

SECTION-B

136. Ans (4)

NCERT 316

140. Ans (1)

NCERT Pg. # 339

141. Ans (3)

NCERT Page # 386

142. Ans (2)

NCERT XIth, Pg. # 309

148. Ans (3)

Module–1

149. Ans (2)

NCERT-XII, Pg. # 46, para–3.3(E),

Pg. # 52, para–3.3(H)

150. Ans (4)

NCERT (XIIth) Pg. # 62, 59, 61

SUBJECT : PHYSICS

SECTION-A

151. Ans (1)

$\eta = 1 - \frac{273}{373}$

$\eta\% = \frac{100}{373} \times 100 = 26.81\%$

152. Ans (2)

Work done = Area of closed loop

$W = -[100 \times 10^3][200 \times 10^{-6}]$

$W = -20$ J

153. Ans (4)

$\frac{\Delta U}{\Delta Q} = \frac{f}{f+2} = \frac{5}{5+2} = \frac{5}{7}$

154. Ans (4)

$V_{r.m.s.} = \sqrt{\frac{3RT}{M_W}}$

$\frac{(V_{r.m.s.})_{He}}{(V_{r.m.s.})_{Ar}} = \sqrt{\frac{(M_w)_{Ar}}{(M_w)_{he}}} = \sqrt{\frac{40}{4}} = 3.16$

155. Ans (1)

$\frac{62-50}{10} = k\left[\frac{62+50}{2} - 26\right]$ .....(1)

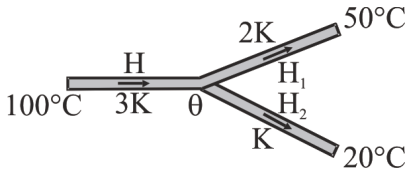
$\frac{50-T}{10} = k\left[\frac{50+T}{2} - 26\right]$ .....(2)

(1)/(2) $\Rightarrow$ T = 42°C

156. Ans (2)

Let the temperature of junction be q then

according to the following figure.



$H = H_1 + H_2$

$\Rightarrow \frac{3K \times A \times (100-\theta)}{l} = \frac{2KA(\theta-50)}{l} + \frac{KA(\theta-20)}{l}$

$\Rightarrow 300 - 3\theta = 3\theta - 120 \Rightarrow \theta = 70°C$

157. Ans (2)

Heat gained = heat lost

$mS_1(32-20) = mS_2(40-32)$

$S_1 \times 12 = S_2 \times 8$

$\frac{S_1}{S_2} = \frac{8}{12} = \frac{2}{3}$

158. Ans (1)

$\Delta V = V(\gamma_L - \gamma_S)\Delta T$

$\gamma_a = \frac{\Delta v}{v} \times \frac{1}{\Delta v}$

$\gamma_a = \frac{1}{100} \times \frac{1}{80} = 1.25 \times 10^{-4}/°C$

159. Ans (3)

$\frac{60-15}{75-15} = \frac{T_y - 25}{125-25}$

$= \frac{45}{60} = \frac{T_y - 25}{100}$

$\frac{3}{4} = \frac{T_y - 25}{100}$

$300 = 4T_y - 100$

$400 = 4T_y$

$T_y = 100$

160. Ans (3)

$\frac{E_2}{E_1} = \left(\frac{T_2}{T_1}\right)^4$

$\Rightarrow T_2 = \left(\frac{E_2}{E_1}\right)^{1/4} \times T_1$

$= (16)^{1/4} \times (273 + 127)$

$\Rightarrow T = 800\ K = 527°C$

161. Ans (3)

$T' = 2\pi\sqrt{\frac{M}{4 \times 64K}} = \frac{T}{16}$

162. Ans (2)

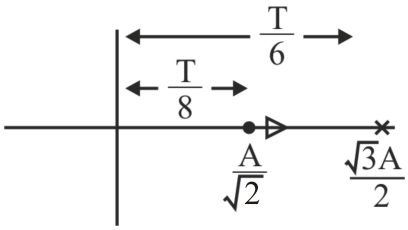
So a = 6cm, ω = 100rad/ sec

$K_{max} = \frac{1}{2}m\omega^2a^2$

$= \frac{1}{2} \times 1 \times (100)^2 \times (6 \times 10^{-2})^2$

= 18 J

163. Ans (4)



Minimum time taken to reach

$\frac{A}{\sqrt{2}}$ to $\frac{\sqrt{3}A}{2}$

$= \frac{T}{6} - \frac{T}{8}$

$= \frac{T}{24}$

164. Ans (4)

For sucessive lengths of resonance

$38 - 13 = 25\ cm = \lambda/2$

$\Rightarrow \lambda = 0.5\ m$

$V = f\lambda$

$= (600)(0.5) = 300\ m/s$

165. Ans (3)

$e = \frac{\ell_2 - 3\ell_1}{2} - \frac{51 - 3(16.5)}{2} = 0.75cm$

166. Ans (2)

$V = \frac{\omega}{k} = \frac{100}{20}$

$= 5\ m/s$

167. Ans (1)

$v = \sqrt{\frac{T}{m}} \Rightarrow \frac{\omega}{K} = \sqrt{\frac{T}{m}} \Rightarrow \frac{\left(\frac{2\pi}{0.04}\right)}{\left(\frac{2\pi}{0.50}\right)} = \sqrt{\frac{T}{0.04}}$

$\Rightarrow \frac{0.50}{0.04} \times \frac{0.50}{0.04} = \frac{T}{0.04}$

$\therefore T = \frac{50}{4} \times 0.5 = 6.25\ N$

168. Ans (2)

torque acting on dipole is given by

$\tau = pE\sin\theta$

$20\sqrt{3} = pE\sin 30° = \frac{pE}{2}$ or $pE = 40\sqrt{3}$

potential energy of dipole in external electric field = $U = -pE\cos\theta = -40\sqrt{3} \times \frac{\sqrt{3}}{2} = -60J$

169. Ans (1)

$$\tau = PE\sin\theta$$

or $\tau = q\ell E\sin\theta$

$$\Rightarrow E = \frac{\tau}{q\ell\sin\theta}$$

$$\Rightarrow E = \frac{4\sqrt{3}}{(8\times10^{-9})(4\times10^{-2})\sin 60^{o}}$$

$$\Rightarrow E = 2.5\times10^{10}\ N/C$$

170. Ans (3)

Net potential on inner sphere is zero

$$\frac{Kq'}{r_1} + \frac{Kq}{r_2} = 0$$

$$q' = -\frac{r_1 q}{r_2}$$

171. Ans (3)

$$v_c = \frac{2k\left(4\times10^{-6}\right)}{\left(a/\sqrt{3}\right)} + \frac{k\left(-4\times10^{-6}\right)}{\left(a/\sqrt{3}\right)}$$

here – $a = 6\sqrt{3}\times10^{-2}$m

$$v_c = \frac{k\left(4\times10^{-6}\right)\sqrt{3}}{6\sqrt{3}\times10^{-2}} = \frac{9\times10^{9}\times4\times10^{-6}\times\sqrt{3}}{6\sqrt{3}\times10^{-2}}$$

$$v_c = 6\times10^{5}\ v$$

172. Ans (2)

$$E = \frac{kd}{r^2} \Rightarrow Q = \frac{E\times r^2}{k}$$

$$Q = \frac{3\times10^{6}\times(2.5)^2}{9\times10^{9}} = 2.08\times10^{-3}$$

174. Ans (3)

Common potential

$$V = \frac{6\times20+3\times0}{(6+3)} = \frac{120}{9}\text{volt}$$

So, charge on 3 μF capacitor

$$Q_2 = 3\times10^{-6}\times\frac{120}{9} = 40\ \mu C$$

175. Ans (2)

$$\Delta V = \frac{E}{d}$$

for region 0 – d, 2d – 3d and 4d – 5d

$$\Delta V = \frac{E}{d} = \frac{\sigma}{\epsilon_0 d}$$ {air filled}

for region d – 2d

$$\Delta V = \frac{E}{d} = 0$$ (electric field inside conductor is 0)

for region 3d – 4d

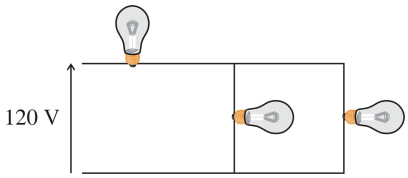
$$\Delta V = \frac{E}{d} = \frac{\sigma}{K\epsilon_0 d}$$ (dielectric filled)

176. Ans (3)

Energy $C_1 = \frac{1}{2}\left[2\times10^{-6}\times6^2\right] = 36\ \mu J$

Energy $C_2 = \frac{1}{2}\left[3\times10^{-6}\times6^2\right] = 54\ \mu J$

177. Ans (3)



Resistance of each bulb

$$R = \frac{(120)^2}{60}$$

Equivalent Resistance of circuit

$$R_{eq.} = \frac{3R}{2}$$

Total power delivered

$$P_{total} = \frac{(120)^2}{R_{eq.}} = \frac{(120)^2}{\frac{3}{2}\frac{(120)^2}{60}} = 40W$$

178. Ans (4)

$$S = \frac{I_g R_g}{I - I_g} = \frac{(2)(30)}{10-2} = \frac{2\times30}{8} = \frac{15}{2} = 7.5\Omega$$

179. Ans (1)

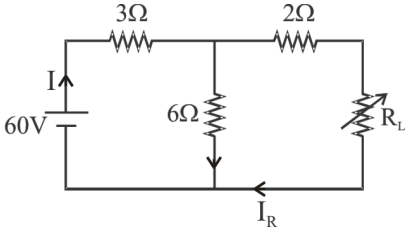
$$\frac{R}{12} = \frac{40}{60} \Rightarrow R = 8\Omega$$

$$R = \rho\frac{\ell}{A}$$

$$\Rightarrow \rho = \frac{RA}{\ell} = \frac{8\times0.2\times10^{-6}}{1}$$

$$= 1.6\times10^{-6}\ \Omega-m$$

180. Ans (1)



For maximum power consumption in

R_L combination of 6Ω, 2Ω and R_L must be

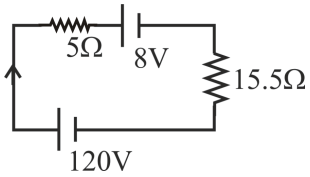
equal to 3Ω.

$\Rightarrow 2 + R_L = 6\Omega, R_L = 4\Omega$

$I = \frac{60}{3+3} = 10A, I_R = \frac{I}{2} = 5A$

$P_R = (5)^2 \times 4 = 100$ W

181. Ans (4)



$I = \frac{120-8}{16} = \frac{112}{16} = \frac{28}{4} = 7A$

$V = E + Ir$

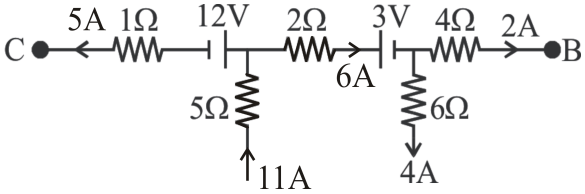
$= 8 + 7 \times \frac{1}{2} = 11.5\Omega$

182. Ans (1)

$R_2 = \frac{v_2}{0.5} = \frac{20 \times 1}{0.5} = 40\Omega$

$R_1 = \frac{69 - v_2}{3.5} = \frac{69-20}{3.5} = 14\Omega$

183. Ans (1)



$V_C - V_B = 1(-5) - 12 + 2(+6) + 3 + 4(+2)$

$= 6$ Volt

184. Ans (1)

Resistance $R \propto \ell$

for current in parallel wires.

$i \propto \frac{1}{R} \propto \frac{1}{\ell}$

$i_1 : i_2 : i_3 : i_4 = \frac{1}{1} : \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$

$= 12 : 6 : 4 : 3$

185. Ans (3)

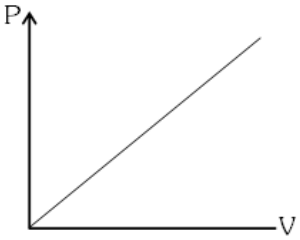
$i = neAV_d$

$20 = (10^{29})(1.6 \times 10^{-19})(10^{-6})\, V_d$

$\Rightarrow V_d = 1.25 \times 10^{-3}$ m/s

SECTION-B

186. Ans (3)



$P \propto V \Rightarrow PV^{-1} = \text{constant}$

compose with

$PV^x = \text{constant}$

$x = -1$

molar heat capacity in the process

$C = C_V + \frac{R}{1-x} = \frac{5R}{2} + \frac{R}{1-(-1)}$

$C = \frac{6R}{2}$

$C = 3R$

187. Ans (4)

$|\text{slope}| = \frac{mp}{v}$

$\tan 37° = m \times \frac{2 \times 10^5}{4 \times 10^5}$

$\frac{3}{4} = m \times \frac{1}{2}$

188. Ans (1)

$PV^{3/2}$ = constant and PV = nRT

$\Rightarrow \quad V^{1/2}T = \text{const.}$

$\Rightarrow \quad V^{1/2}T = \text{const.}$

$\Rightarrow \quad \left(\frac{V}{2}\right)^{1/2} T^1 = \text{const.}$

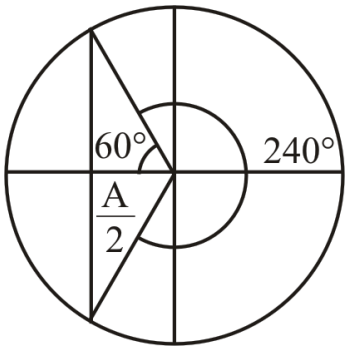
$\Rightarrow \quad T^1 = T\sqrt{2}$

190. Ans (3)

$\lambda_m \propto \frac{1}{T}$

$(E\lambda)_{max} \propto T^5$

191. Ans (2)



$T' = \frac{240^o}{360^o} \times T = \frac{2}{3} 2\pi\sqrt{\frac{1}{g}}$

$T' = \frac{4}{3}\text{sec}$

192. Ans (3)

let frequency of T-F is f

$f_{wire} \propto \frac{1}{\ell}$

$\frac{f_1}{f_2} = \frac{\ell_2}{\ell_1} \Rightarrow \frac{f-4}{f+4} = \frac{49}{50}$

f = 396 Hz.

193. Ans (4)

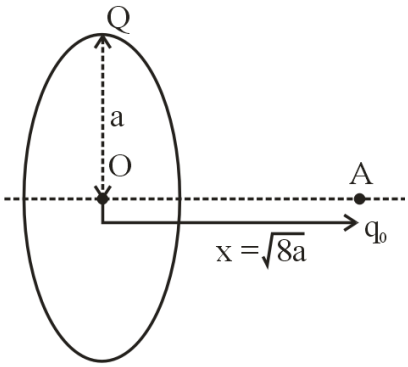
$\upsilon_0 = \frac{1}{2L}\sqrt{\frac{F}{\mu}}$

$$\frac{416 = \frac{1}{2L}\sqrt{\frac{4kg\omega t}{\mu}}}{416 = \frac{1}{2(2L)}\sqrt{\frac{F}{\mu}}}$$

$1 = 2\sqrt{\frac{4}{F}}$

F = 16 kg

194. Ans (2)



$W = \Delta U = U_f - U_i$

$= q_0\Delta V = q_0(V_f - V_i) = q_0(V_A - V_0)$

$\Rightarrow W = q_0\left(\frac{KQ}{3a} - \frac{KQ}{a}\right) = \frac{-2KQq}{3a}$

$= -\frac{Qq_0}{6\pi\varepsilon_0 a}$

195. Ans (3)

Assertion is correct but reason is false, because electric field inside cavity depends on distance between centre of sphere & cavity.

$\vec{E}_{cavity} = \frac{\rho}{3\epsilon_0}(\overrightarrow{OC})$

O ⟶ Centre of sphere

C ⟶ Centre of cavity

196. Ans (2)

Electric field due to each sheet is

$= \frac{\sigma}{2\epsilon_0} = E$

both field are perpendicular to each other hence,

$E_{net} = \sqrt{2}\,E = \sqrt{2}\left[\frac{\sigma}{2\epsilon_0}\right] = \frac{\sigma}{\sqrt{2}\epsilon_0}$

$= \frac{\sigma}{\sqrt{2}\epsilon_0} = \frac{\sqrt{2}\epsilon_0 \times 10^{-3}}{\sqrt{2}\epsilon_0} = 10^{-3}\text{N/C}$

198. Ans (4)

Initial energy stored in capacitor

$U_i = \frac{1}{2}CV^2 = \frac{1}{2} \times C \times (50)^2 = \frac{1}{2}C\,(50)^2$

After as when potential drops by 10V, the final potential is 40 V.

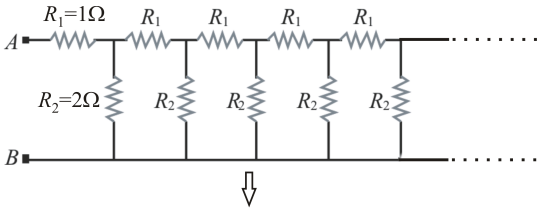
Final energy stored in the capacitor.

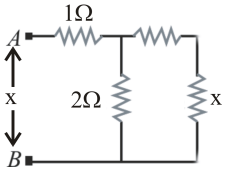
$U_f = \frac{1}{2}C\,(40)^2$

Fraction of energy stored in the capacitor.

$= \frac{U_f}{U_i} = \frac{\frac{1}{2}C(40)^2}{\frac{1}{2}C(50)^2} = \frac{(40)2}{(50)^2} = 0.64$

199. Ans (3)





$$x = \frac{2x}{2+x} + 1$$

$\Rightarrow 2x + 2 + x = 2x + x^2$

$\Rightarrow x^2 - x - 2 = 0$

$\Rightarrow x = 2$

200. Ans (3)

Here, $R_1 = 2.5\ \Omega$, $T_1 = 84°C$

$R_2 = 2.9\ \Omega$ and $T_2 = 100\ °C$

As $R_2 = R_1[1 + \alpha(T_2 - T_1)]$

$\therefore 2.9 = 2.5\ [1 + \alpha(100 - 84)]$

$$\frac{2.9}{2.5} - 1 = \alpha[16] \text{ or } \alpha = \frac{1}{16} \times \frac{2.9 - 2.5}{2.5}$$

$$= \frac{1}{16} \times \frac{0.4}{2.5} = 10^{-2}\ °C^{-1}$$