MOCK TEST PAPER

ANSWER KEY

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

HINT – SHEET

25. $\log\frac{k_2}{k_1}=\frac{E_a}{2.303R}\left[\frac{1}{T_1}-\frac{1}{T_2}\right]$

If $\frac{k_2}{k_1}=2$

$$\log 2=\frac{E_a}{2.303\times 8.314}\left[\frac{1}{300}-\frac{1}{310}\right]$$

$$E_a=.3010\times 2.303\times 8.314\left(\frac{300\times 310}{10}\right)$$

$= 53598.59 Jmol^{-1} = 54kJ$

30. $IO_3^- + aI^- + bH^+ \rightarrow cH_2O + dI_2$

Step 1: $I^{-1} \rightarrow I_2$ (Oxidation)

$IO_3^- \rightarrow I_2$ (reduction)

Step 2: $2IO_3^- \rightarrow 12H^+ \rightarrow I_2 + 6H_2O$

Step 3: $2IO_3^- \rightarrow 12H^+ + 10e^- \rightarrow I_2 + 6H_2O$

$2I^- \rightarrow I_2 + 2e^-$

Step 4 : $2IO_3^- + 12H^+ + 10e^- \rightarrow I_2 + 6H_2O$

$[2I^- \rightarrow I_2 + 2e^-]5$

Step 5: $2IO_3^- + 10I^- + 12H^+ \rightarrow 6I_2 + 6H_2O$

$IO_3^- + 5I^- + 6H^+ \rightarrow 3I_2 + 3H_2O$

On comparing, a = 5, b = 6, c = 3, d = 3

35. No. of moles of $H_2 = \frac{1.12}{22400}$

$\therefore$ No. of equivalents of hydrogen

$= \frac{1.12\times 2}{22400} = 10^{-4}$

No. of Faradays required = 10^{-4}

$\therefore$ Current to be passed in 1 sec.

$= 96500 \times 10^{-4}$

$= 9.65A.$

40. $\lambda^O_{Na^+} + \lambda^O_{OH^-} = 248\times 10^{-4} Sm^2mol^{-1}$

$\lambda^O_{Na^+} + \lambda^O_{Cl^-} = 126\times 10^{-4} Sm^2mol^{-1}$

$\lambda^O_{Ba^{2+}} + \lambda^O_{2Cl^-} = 280\times 10^{-4}$

Now, $\lambda^O_{Ba(OH)_2} = \lambda^O_{BaCl_2} + 2\lambda^O_{NaOH} - 2\lambda^O_{NaCl}$

$\lambda^O_{Ba(OH)_2} = 280\times 10^{-4} + 2\times 248\times 10^{-4} + 2\times 126\times 10^{-4}$

$\lambda^O_{Ba(OH)_2} = 524\times 10^{-4} Sm^2mol^{-1}.$

45. According to Hardy schulze rule the ions having opposite charge to sol particle cause coagulation and greater the valency of oppositely charged ion more is the coagulating power ($PO_4^{3-} > SO_4^{2-} > NO_3^-$)

46. NCERT (XIth) Pg. # 18, 19, 20

47. NCERT Pg. # 76, 77

48. NCERT - XI (E) Pg. # 111, 115

49. NCERT Eng./Hindi Pg. # 112 Para no. 3 and 4

56. NCERT (XIth) Pg. # 35, 38

58. NCERT - XI (Hindi) Pg. # 104 Para-IIIrd

59. NCERT XI Pg. # 213

61. NCERT-XI, Page # 334 (E), 335(H)

63. NCERT Pg.# 131

66. NCERT (XIth) Pg. # 38, 39

68. NCERT - XI (E) Pg. # 298

69. NCERT XI Pg.# 217

70. NCERT XI Pg.# 133, Fig. 8.5

71. NCERT-XI, Page # 326 (E), 325(H)

72. NCERT XII, Page no. 92, para-2

73. NCERT Pg.# 136 Fig. 7.8

74. NCERT (XII) page no .154 (E), 166(H)

76. NCERT Pg. # 87, 89

78. NCERT - XI (E) Pg. # 288, 298, 299

79. NCERT XI Pg.# 213-214

81. NCERT-XI, Page # 328 (E), 327(H)

82. NCERT XII, Page no. 182

84. NCERT (XII) page no .157-158 (E), 169-171 (H)

86. NCERT (XIth) Pg. # 24

87. NCERT XIIth Pg # 47

88. NCERT - XI (E) Pg. # 286

89. NCERT XI Pg.# 233

90. NCERT XI Pg. # 143

92. NCERT XII, Page no. 183, para-III

93. NCERT Pg.# 131

96. NCERT Pg. # 87, 88, 89

97. NCERT XIIth Pg # 48

98. NCERT - XI (E) Pg. # 303, 304

100. NCERT Pg. # 148

102. NCERT XII, Page no. 198

106. NCERT Pg. # 19, 20, 25

107. NCERT XIth Pg # 58

116. NCERT (XIth) Pg. # 43

118. NCERT - XI (E) Pg. # 292 Fig. 19.2

120. NCERT XIth 281, 82

123. NCERT (XII) page no .145, 150-152(E), 156, 161-163 (H)

126. NCERT (XIth) Pg. # 4, 5

128. NCERT - XII (E) Pg. # 167

130. NCERT XIth 273

131. NCERT XII, Page no. 79

133. NCERT (XII) page no .159(E),172(H)

136. $X = C = \frac{Q}{V} = \frac{Q^2}{QV} = \frac{A^2T^2}{ML^2T^{-2}} = M^{-1}L^{-2}T^4A^2$

$$Z = B = \frac{F}{QV} = \frac{M^{+1}LT^{-2}}{ATLT^{-1}} = MT^{-2}A^{-1}$$

$$Y = \frac{X}{Z^2} = \frac{M^{-1}L^{-2}T^4A^2}{M^2T^{-4}A^{-2}} = M^{-3}L^{-2}T^8A^4$$

137. $0.25 \times 200 = 0.25 \times 100 + (1 + 2)\,V$

$$V = \frac{25}{3}$$

138. $a = -w^2x$

139. $i = \frac{2}{10} = 0.2$

$V_{x-y} = 6 - 0.2 \times 2 = 5.6$

140. $E_Y = E_0 \cos\omega(t - \frac{x}{c})$

$B_Z = B_0 \cos\omega(t - \frac{x}{c})$

$\frac{\omega}{k} = v$

$\omega = 2\pi \times 10^{11}$

$B_0 = \frac{E_0}{C}$

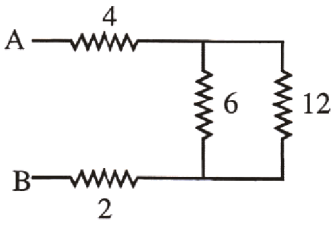
141. $h = \frac{2s\cos\theta}{rpg}$

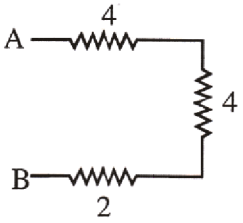
$s = \frac{hrpg}{2\cos\theta} = 98 \text{ dyne/cm}$

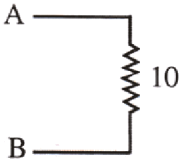
142. $\Delta T = \frac{mv^2}{R} = 2mg$

143. $v = n\lambda$
$= 0.4 \times 10^{-2} \times 250 = 1 \text{ ms}^{-1}$

144.

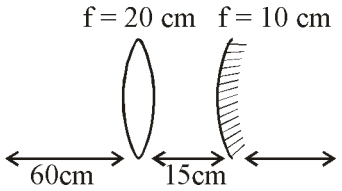






145. $\frac{1}{v} - \frac{1}{2} = \frac{1}{f}$

$\frac{1}{v} - \frac{1}{-60} - \frac{1}{+20}$



$\frac{1}{V} = \frac{1}{20} - \frac{1}{60} = \frac{2}{60} = \frac{1}{30}$

v = +30 cm

$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$\frac{1}{v} + \frac{1}{+15} = \frac{1}{+10}$

$\frac{1}{v} = \frac{1}{30}$

v = +30 cm

146. (a) $\vec{L} = \vec{r} \times \vec{p} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & 2 & -1 \\ 3 & 4 & -2 \end{vmatrix} = -\hat{j} - 2\hat{k}$

i.e. the angular momentum is perpendicular to x-axis

147. Torque zero means, $\propto = 0$

$\frac{d^2\theta}{dt^2} = 0 \quad \Rightarrow \quad 12t - 12 = 0$

t = 1 sec.

148. $y = A \cos(\omega t + kx)$

$v = \frac{\omega}{k}$

$y = 0.5 \cos(\pi t + \pi x)$

149. $Pt = nLv$

$t = \frac{10^{-1} \times 2260 \times 10^3}{1.08 \times 10^3} \simeq 209.2 \simeq 210 s$

150. $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$

$\frac{1}{+12} - \frac{1}{u} = \frac{1}{2}$

$\frac{1}{u} = \frac{1}{12} - \frac{1}{2} = \frac{-5}{12}$

u = –2.4 cm

151. Velocity acquired by body in 10sec

$v = 0 + 2 \times 10 = 20 \text{ m/s}$

and distance travelled by it in 10 sec

$S_1 = \frac{1}{2} \times 2 \times (10)^2 = 100 \text{ m}$

then it moves with constant velocity (20 m/s) for

$S_2 = 20 \times 30 = 600 \text{ m}$

After that due to retardation $(4 m/s^2)$ it stops

$S_3 = \frac{v^2}{2a} = \frac{(20)^2}{2 \times 4} = 50 m$

Total distance travelled $S_1 + S_2 + S_3 = 750 m$

153. $\nu = \frac{\omega}{k} = \frac{8}{1/8} = 64$

154. $B_T = \sqrt{B_1^2 + B_2^2 + 2B_1B_2 \cos\theta}$

$B_T = \frac{\sqrt{3}\, MoNi}{2R} \theta = 60°$

$B_T = \frac{\sqrt{3} MoNi}{2R}$

155. $W = \frac{2\lambda D}{d} = \frac{2 \times 6000 \times 10^{-10} \times 1.5 \times \sqrt{2}}{12000 \times 10^{-10}}$

156. Let student will catch the bus after t sec. So it will cover distance ut.

Similarly distance travelled by the bus will be

$\frac{1}{2}at^2$ for the given condition

$ut = 50 + \frac{1}{2}at^2 = 50 + \frac{t^2}{2}$ [a = 1 m/s^2]

$\Rightarrow u = \frac{50}{t} + \frac{t}{2}$

To find the minimum value of u

$\frac{du}{dt} = 0$, so we get t = 10 sec, then u = 10 m/s

157. $H_C = \frac{Q}{\Delta Q} = \frac{300}{45 - 25} = 15 J/°C$

$ms = H_C$

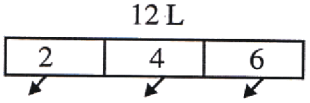
$S = \frac{15}{25 \times 10^{-3}} = 600 J/kg°C$

158. $g - \omega^2 R = \frac{3}{5}g$

$\Rightarrow \omega^2 R = \frac{2}{5}g$

$\omega = \sqrt{\frac{2g}{5R}}$

159. M = 12 mL



$M_1 = 2mL \quad M_2 = 4mL \quad M_3 = 6mL$

$\mu' = \sqrt{\mu_1^2 + \mu_2^2 + \mu_3^2}$

$= 2mL\sqrt{1+4+9} = \frac{\mu}{6}\sqrt{14} = \mu\sqrt{\frac{7}{18}}$

160. K_{max} $h(\nu - \nu_0)$

$\frac{1}{k} = \frac{h(\nu_1 - \nu_0)}{h(\nu_2 - \nu_0)}$

$\nu_0 = \frac{k\nu_1 - \nu_2}{k - 1}$

161. T = m (g + a)
= 6000 × 15 = 90000 N

162. Heat loss = Heat gain

$ms_w\Delta\theta = m's_{ice}\Delta\theta + m'Lf + m's_w\Delta\theta$

$200 \times 1 \times 15 = m'[\frac{1}{2} \times 14 + 8 + 10]$

$m' = \frac{200 \times 15}{97} = 31gm$

163. $F \propto r^{-3/2}$

$F = \frac{K}{r^{3/2}}$

$\frac{mv^2}{r} = \frac{K}{r^{3/2}}$

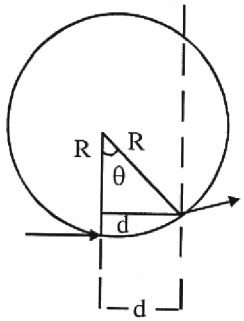
$\Rightarrow v \propto r^{-1/4}$

$\Rightarrow T = \frac{2\pi r}{\nu}$

so $T \propto r^{5/4}$

or $T^2 \propto r^{5/2}$

164.



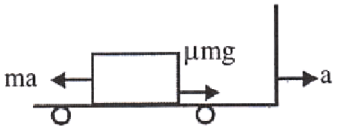
$\sin\theta = \frac{d}{R}$

$= \frac{dQB}{P}$

165. $E = \frac{h^2}{2m\lambda^2}$

$E_1 > E_3 > E_2$

166.

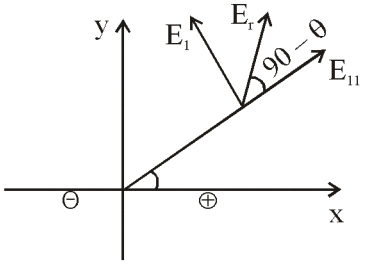


$ma \le \mu mg$

$a \le \mu g$

167. Theoretical question

168. $\tan 90-\theta = \frac{E_1}{E_{11}}$



$\cot\theta = \frac{1}{2}\tan\theta$

$\Rightarrow \tan^2\theta = 2$

$\tan\theta = \sqrt{2}$

169. $P = \frac{e^2}{R}; e = -\frac{d}{dt}(BA) = A\frac{d}{dt}(B_o e^{-t}) = AB_o e^{-t}$

$\Rightarrow P = \frac{1}{R}(AB_o e^{-t})^2 = \frac{A^2B_0^2e^{-2t}}{R}$

At the time of starting t = 0 so $P = \frac{A^2B_o^2}{R}$

$\Rightarrow P = \frac{(\pi r^2)^2 B_o^2}{R} = \frac{B_o^2\pi^2r^4}{R}$

170. $N = N_0 e^{-2t}$

$10^6 = \sqrt{2}\times10^6 e^{-\lambda 10}$

$10\lambda = \ell n\sqrt{2} = \frac{1}{2}\ell n2$

$20 = \frac{\ell n2}{\lambda} = t_{1/2}$

171. $M = \frac{1}{2}\frac{m}{2}\mu^2(1-e^2) = \frac{T_i}{2}(1-e^2)$

$\frac{1}{4} = \frac{1}{2}(1-e^2) = D \qquad e^2 = \frac{1}{2}$

$e = \frac{1}{\sqrt{2}}$

172. m(1) (100 – 35) = (20 – m) (1) (25)

m(13) = (20 – m) (5)

13 m = 100 – 5 m

18 m = 100

$m = \frac{100}{18} = \frac{50}{9} = 5.55$

174. By using $e = \frac{1}{2}Bl^2\omega$

For part AO; $e_{OA} = e_O - e_A = \frac{1}{2}Bl^2\omega$

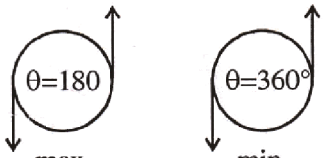
For part OC; $e_{OC} = e_O - e_C = \frac{1}{2}B(3l)^2\omega$

175.

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

or Gate

176.

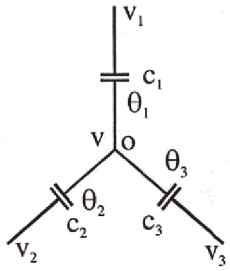


max $\Delta p = 2mv$ min $\Delta p = 0$

177. $k_{eq} = \frac{2}{3}k$

$T = 2\pi\sqrt{\frac{3m}{2k}}$

178.



$\theta_1 + \theta_2 + \theta_3 = 0$

$c_1 (v-v_1) + c_2 (v-v_2) + c_3 (v-v_3) = 0$

$$v = \frac{c_1v_1 + c_2v_2 + c_3v_3}{c_1 + c_2 + c_3}$$

179. Frequency = $\frac{1}{2\pi\sqrt{LC}}$

So the combination which represents dimension of frequency is $\frac{1}{\sqrt{LC}} = (LC)^{-1/2}$.

180. $I_e = \frac{10^8 e}{10^{-8}} = 10^{16} e$

$I_b = \frac{1}{100} I_e = 10^{14} e$

$= 10^{14} \times 1.6 \times 10^{-19}$

$= 1.5 \times 10^{-5}$ A

$\beta = \frac{I_c}{I_b} = 99$