LEADER TEST SERIES / JOINT PACKAGE COURSE

TARGET : PRE-MEDICAL 2016

Test Type : **ALL INDIA OPEN TEST** (MAJOR) Test Pattern : AIPMT

TEST DATE : 21 - 02 - 2016

ANSWER KEY

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

HINT – SHEET

1. $\vec{G}_{AB} = \vec{G}_A - \vec{G}_B$

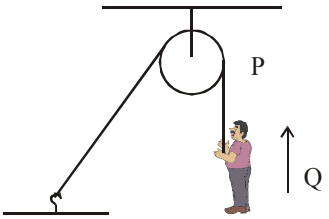
2. $\Delta\phi = \frac{2\pi}{\lambda}\cdot\frac{\lambda}{6} = \frac{\pi}{3}$

$I = I_0 + I_0 + 2\sqrt{I_0^2}\left(\frac{1}{2}\right) = I_0 + I_0 + I_0 = 3I_0$

$I_{max} = \left[\sqrt{I_1} + \sqrt{I_2}\right]^2 = 4I_0$

$\frac{I}{I_{max}} = \frac{3I_0}{4I_0} = \frac{3}{4}$

3.



T = 840 N

ma = T-mg

T = m (g + a)

840 = 60 (10 + 9)

$\boxed{9 = 4 m/s^2}$

4. Stability α move BE/A

5. $k \alpha t$ $\quad v\alpha\sqrt{t}$

$F = ma$ $\quad a = \frac{dv}{dt}\alpha\frac{1}{\sqrt{t}}$

$F\alpha\frac{1}{\sqrt{t}}$

6. $\frac{N_1}{N_2}=\frac{I_2}{I_1}$

$\frac{140}{280}=\frac{I_2}{4}\Rightarrow I_2=2A$

D_2 – RB

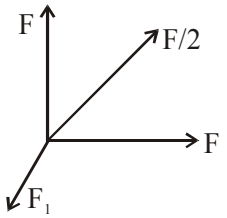
D_1 – RB

7. $T\propto r^{\frac{3}{2}}$

$\frac{T^1}{T}=(4)^{\frac{3}{2}}$

$T^1 = 5 \times 8 \quad = 40$

8. $v_{mix}=\frac{Cp_{mix}}{Cv_{min}}=\frac{n_1cp_1+n_2cp_2}{n_1cv_1+n_2cv_2}$



9. $\vec{u}=\hat{i}+2\hat{j}$ u cos θ = 1 tan θ = 2

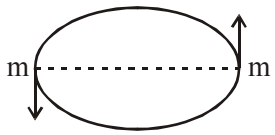
u sin θ = 2 $u^2(1) = 1 + 4 = 5$

$y = x\tan\theta - \frac{g}{2(u\cos\theta)^2}.x^2$ $u=\sqrt{5}$

$y=x(2)-\frac{10}{2\times5}(1+4)x^2$ $\sec^2\theta = 1 + \tan^2\theta$

$y = 2x - 5x^2$

10.



$F_C=\frac{Gm^2}{(2R)^2}=\frac{mv^2}{R}$

$V=\sqrt{\frac{Gm}{4R}}$

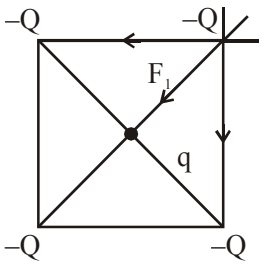
11. $I=\frac{12}{4+2}=2A$

12. $I_x=\frac{1}{2}mR^2=\frac{1}{2}(\rho\pi R^2t)R^2$

$I_y=\frac{1}{2}m_2(4R)^2=\frac{1}{2}(\rho\pi(4R)^2\left(\frac{t}{4}\right)=(4R)^2$

$= 64\ I_x \quad \Rightarrow \boxed{I_y=64I_x}$

13.

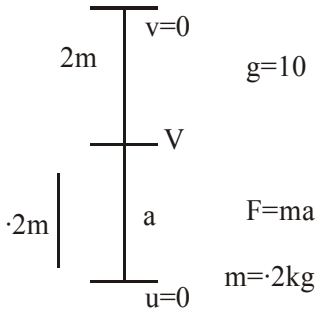


$\left(2\sqrt{2}F+F/2\right)+F_1=0$

$\left(2\sqrt{2}+1\right)\frac{kQ^2}{a^2}-\frac{kQq}{\left(\frac{a}{\sqrt{2}}\right)^2}=0$

$q=\frac{Q}{4}\left(1+2\sqrt{2}\right)$

14.



$v^2 = 0^2 + 2a(\cdot2)$

$v^2 = \cdot4a$

$0^2 = v^2 - 2 \times 10 \times 2$

$v^2=40=\cdot4a=\frac{4a}{10}$

$\boxed{a=100}$

F = ma

$= \cdot2 \times 100 = 20$ N

15. $F_{av} = 0 + F/2 = F/2$

$W=\left(\frac{0+F}{2}\right)\ell=\frac{F\ell}{2}$

16. $V_T=\frac{2r^2}{9\eta}(\rho-\sigma)g$

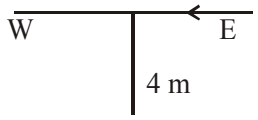
17. $\dfrac{C_1V_1 - C_2V_2}{C_1 + C_2} = 0$

$C_1V_1 = C_2V_2$

$3C_1 = 5C_2$

$C_1 120 = C_2\ 200$

18.



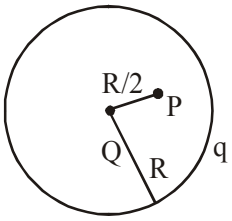
$B = \dfrac{\mu_0 I}{2\pi r}$ south

19. $(\Delta g)_{in} = (\Delta g)_{out}$

$\left(\dfrac{d}{R}\right)g = \left(\dfrac{2h}{R}\right)g$

$\boxed{d = 2h}$

20.



$\boxed{V_{in} = V_s = kq/R}$

$V_p = \dfrac{kQ}{R/2} + \dfrac{kq}{R}$

$V_p = \dfrac{2Q}{4\pi \in_0 R} + \dfrac{q}{4\pi \in_0 R}$

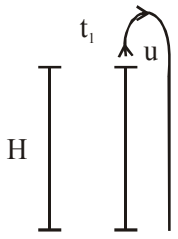
21. $W = T.\Delta A = T\ (4\pi r_2^2 - 4\pi r_1^2)$

22. $0^2 = u^2 - 2as_1$

$S_1 = \dfrac{u^2}{2a}$

$\dfrac{S_1}{S_2} = \left(\dfrac{u_1}{u_2}\right)^2 = \dfrac{u^2}{16u^2} = \dfrac{1}{16} \Rightarrow 1:16$

23.



$t_1 = \dfrac{u}{g}$

$t_2 = nt_1 = \dfrac{nu}{g}$

$H = -ut_2 + \dfrac{1}{2}gt_2^2$

put & solve

$2g\ H = nu^2\ (n - 2)$

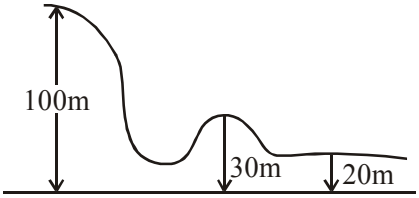
24. $I = I_0e^{-t/\tau}$

$I_0 = \dfrac{E}{R} = \dfrac{100}{100} = 1$

$\tau = \dfrac{L}{R} = \dfrac{100 \times 10^{-3}}{100} = 1\ \text{m sec}$

$I = 1 \cdot e^{-1} = \dfrac{1}{e}A$

25.



Using, energy - conservation theorem

Loss in PE = gain in kE

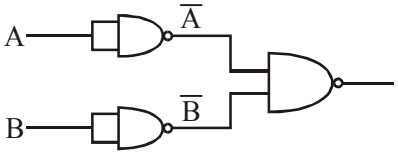
$mg(\Delta h) = \dfrac{1}{2}mv^2 + \dfrac{1}{2}I\omega^2$

$\Delta h = 80m,\ \omega = \dfrac{v}{r};\quad I = \dfrac{2}{5}mr^2$

$g = 10\ m/s^2$

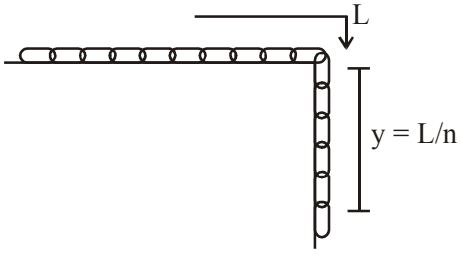
$v = 40\sqrt{\dfrac{5}{7}}\ m/s$

27.



$Y = \overline{\overline{A} \cdot \overline{B}} = \overline{\overline{A}} + \overline{\overline{B}} = A + B$ OR gate

28.



$W = \dfrac{mgL}{2n^2}$

W = 3.6 J L = 2m

$y = \dfrac{L}{n}$ $n = \dfrac{10}{3}$

29. use TIR r = 90 $\mu \sin(90 - r) = 1.\sin 90$

$1.\sin\theta = \mu \sin r$ $\mu \cos r = 1$

$\sin\theta = \frac{2}{\sqrt{3}}\left(\frac{1}{2}\right) = \frac{1}{\sqrt{3}}$ $\cos r = \frac{1}{\mu}$

$\boxed{\theta = \sin^{-1}\left(\frac{1}{\sqrt{3}}\right)}$ $\sin r = \sqrt{1 - \frac{1}{\mu}} = \sqrt{1 - \frac{3}{4}}$

$\sin r = \frac{1}{2}$

r = 300

30. $\frac{R}{S^5} = \frac{80}{20}$

$R = 220\ \Omega$

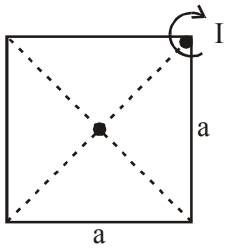
31. $|P| = [M^1 L^{-1} T^{-2}]$, $|\lambda| = [M^1 L^2 T^{-1}]$

32. $\alpha = {}_2He^4$

$\beta^- = -1e^o$ remove

$\beta^+ = +1e^o$

33.



$I = \frac{ma^2}{6} + m\left(\frac{a}{\sqrt{2}}\right)^2 = \frac{2}{3}ma^2$

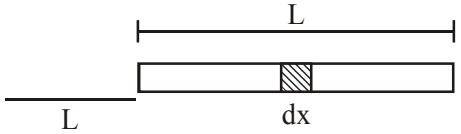
34. S = 2R

$P = \frac{R}{2}$ S = 2 (2P)

S = 4P n = 4

35. $dv = \frac{kdq}{x} = \left(\frac{kQ}{L}\right)\frac{dx}{x}$

$dq = \left(\frac{Q}{L}\right)dx$



$v = \int_L^{2L} \frac{kQ}{L}\frac{dx}{x}$

$= \frac{Q}{4\pi\in_0 L}\ell n_2$

36. 5, 1, 2

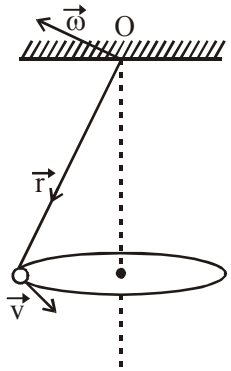
37. $W = pE\cos\theta = \frac{pE}{2}$

38. $E_1 = \frac{13.6eV}{n^2}$

n = 2

E_2 = 3.4 eV

40.



The direction of $\vec{\omega}$ vector is always $\perp^r$ to the plane containing $\vec{r}$ & $\vec{v}$, as shown in fig. (at any instant).

Angular momentum

$\vec{L} = I\vec{\omega}$

Obviously, $\vec{L}$ changes, as $\vec{\omega}$ changes in direction but $\vec{\tau} \Uparrow\Uparrow d\vec{\theta}$.

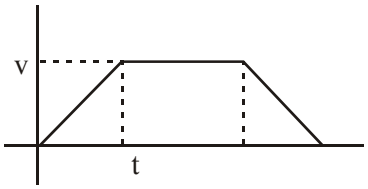
$\therefore$ No work is done by torque due to weight of bob.

So $|\vec{\omega}| =$ constant

or $|\vec{L}| =$ constant

41. $RP \propto \frac{1}{\lambda} = 5:4$

42.



15 S = area under v-t graph

$S = \frac{1}{72}ft^2$

45. 

$\tau = I\alpha$ $\boxed{I = mR^2}$

$$T.R = mR^2 \cdot \frac{a}{R}$$

$$\left(\frac{M}{0}\right)9 = T$$

$ma = mg - T$ ....(1)

$(m + m)a = mg$

$\boxed{a = g/2}$

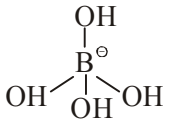
48. $-CH_3$ group have more $\propto H$

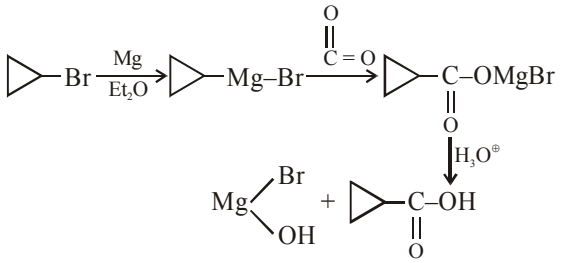
49. More acidic reacts faster

50. Reactivity of inter halogen is more than halogens excepts F_2.

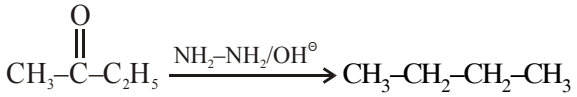
53. Reactivity towards SN^2 $1^o > 2^o > 3^o$ Alkyl halide

54. 

55. $H_3BO_3 + \overset{\ominus}{O}H \rightarrow$  aprotic acid

59. 

60. $Zn + \text{dil. } HNO_3 \rightarrow Zn(NO_3)_2 + N_2O$ (Nitrous oxide)

63. 

Wolf Kishner Reduction

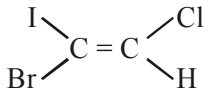
65. $(NH_4)_2\,Cr_2O_7 \xrightarrow{\Delta} N_2 + Cr_2O_3 + H_2O$

69. I.E $\Rightarrow Be^{+2} > Li^+ > He > He^-$

73. Reactivity towards (HCl) or Electrophile

$\propto$ stability of carbocation

$$\propto \frac{+M/+I}{-M/-I}$$

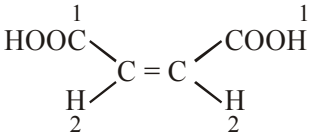
77. $C_2ClHI\,Br \Rightarrow$ 

asymmetric carbon absent

78. $CH_3–C \equiv C – CH_3 \xrightarrow[Zn/H_2O]{O_3} CH_3–\underset{\underset{O}{\|}}{C}–\underset{\underset{O}{\|}}{C}–CH_3$

79. Solubility $\Rightarrow$ LiI > LiBr > LiCl > LiF

80. $Cr_2O_3 + 2A\ell \rightarrow 2Cr + A\ell_2O_3$

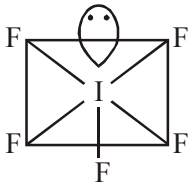
82. 

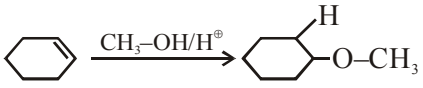
Same priority same side – 'Z' (Cis)

83. $C_2H_5Cl \xrightarrow[Ag_2O]{Moist} \underset{(A)}{CH_3 - CH_2 - OH} \xrightarrow[360°C]{Al_2O_3}$

$\underset{(B)}{CH_2 = CH_2} \xrightarrow{S_2Cl_2} S + \overset{Cl}{\overset{|}{C}}H_2–CH_2–S–CH_2–\overset{Cl}{\overset{|}{C}}H_2–CH_2$

Mustard gas

84. IF_5  $< 90°$

88. 

91. NCERT XII, Pg. # 23

92. NCERT XII Pg # 55

93. NCERT Pg # 23,24

94. Allen Booklet 2, page 17

98. NCERT XII Pg. # 133 figure 7.5

100. Module Pg. # 6

102. NCERT XII Pg # 43

104. NCERT Pg # 57

106. NCERT Pg. # 169, 170

107. NCERT Pg. # 207

110. Module Pg. # 2,3

111. NCERT XII, Pg. # 27

113. NCERT Pg # 34

114. NCERT Pg # 57/ Allen booklet 2 pg. 60(E), 61(H)

116. NCERT Pg. # 131
117. NCERT Pg. # 223
119. NCERT Pg. # 260
123. NCERT Pg # 17
126. NCERT Pg. # 168, 169
127. NCERT Pg. # 250
129. NCERT Pg. # 271
131. NCERT XII, Pg. # 25
133. NCERT Pg # 101,102
137. NCERT Pg. # 243
139. NCERT Pg. # 232-233,234
141. NCERT XIth Pg#78,79,80,81
143. NCERT Pg # 103
146. NCERT Pg. # 159
147. NCERT XII Pg. # 127 Ist para
149. NCERT Pg. # 270,271,272,274
153. NCERT Pg # (E) 115, (H) 116
156. NCERT Pg. # 156/159
157. NCERT XII Pg. # 136 figure 7.8 (c)
159. Module Pg. # 34
161. NCERT XIth Pg#85
162. NCERT Pg # 34
163. Allen Booklet 2 Pg # (E) 148, (H) 155
166. NCERT Pg. # 228
169. Module Pg. # 48
171. NCERT XII Pg # 43
172. NCERT Pg # 17
173. NCERT Pg # (E) 52, (H) 51,52
176. NCERT Pg. # 208
179. Module Pg. # 5,6,7