ENTHUSIAST COURSE

TARGET : PRE-MEDICAL 2013

ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)

Path to Success

MAJOR TEST # 03

ALLEN NEET-UG (FULL Syllabus) | **DATE : 16 - 01 - 2013**

ANSWER KEY

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

HINT – SHEET

1. $v = \omega\sqrt{a^2 - x^2} \Rightarrow x = \sqrt{a^2 - \frac{v^2}{\omega^2}}$ $(\because \omega^2 = \frac{k}{m})$

$$x = \sqrt{a^2 - \frac{v^2 m}{k}} = \sqrt{(0.5)^2 - \frac{(0.4)^2 \times (10)}{(10)}}$$

$$= \sqrt{0.25 - 0.16} = \sqrt{0.09} = 0.3\text{m}$$

2. $\Delta\lambda = \lambda \times \frac{V_0}{c} = 5700 \times \frac{100 \times 10^3}{3 \times 10^8}$

$= 1.9\ \mathring{A}$

3. K.E. $= \frac{1}{2}mv^2 = \frac{1}{2}m\omega^2 (A^2 - x^2)$

at $x = 0$, K.E. $= \frac{1}{2}mv^2_{max} = \frac{1}{2}m\omega^2A^2$

at $x = \frac{A}{2}$, K.E. $= \frac{1}{2}mv^2 = \frac{1}{2}m\omega^2\left[A^2 - \left(\frac{A}{2}\right)^2\right]$

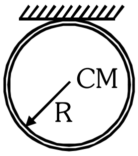
$$= \frac{3}{4}\left[\frac{1}{2}m\omega^2A^2\right] \Rightarrow \frac{KE_{x=0}}{KE_{x=A/2}} = \frac{4}{3}$$

4. $I \propto A^2$

$$\therefore \frac{I_{max}}{I_{min}} = \frac{(A_1 + A_2)^2}{(A_1 - A_2)^2} = \frac{16}{4} = 4:1$$

5. $\alpha = \frac{\tau}{I} = \frac{30}{2} = 15$ rad/sec^2

Now $\theta = 0 + \frac{1}{2}\alpha t^2 = \frac{1}{2} \times 15 \times (10)^2 = 750$ rad

7. 

$T = 2\pi\sqrt{\dfrac{\ell + \dfrac{K^2}{\ell}}{g}}$

Here $\ell = R$, $MK^2 = MR^2 \Rightarrow K = R$

$\Rightarrow T = 2\pi\sqrt{\dfrac{R+R}{g}} = 2\pi\sqrt{\dfrac{2R}{g}}$

14. $v = \dfrac{2r^2}{9\eta}(\rho - \sigma)g$

$\dfrac{v_1}{v_2} = \left[\dfrac{\rho_1 - \sigma}{\rho_2 - \sigma}\right]$

$\dfrac{0.2}{v_2} = \left[\dfrac{19.5 - 1.5}{10.5 - 1.5}\right]$

$v_2 = 0.1$ m/s

18. $k = yr_0$

$r_0 = \dfrac{k}{y} = \dfrac{3.6 \times 10^{-9}}{1.2 \times 10^{11}} = 3 \times 10^{-20}$m

21. $\dfrac{1}{F} = \dfrac{1}{f_1} - \dfrac{1}{f_2}$

The combination is convex; therefore F must be positive. This is possible when $f_2 > f_1$. This gives F greater than f_1. So, the image will shift away from the lens system.

23. $\dfrac{1}{f} = (\mu - 1)\left(\dfrac{1}{R_1} + \dfrac{1}{R_2}\right)$

or $\dfrac{1}{6} = (1.5 - 1)\left(\dfrac{1}{R} + \dfrac{1}{2R}\right)$

Solving, we get R = 4.5 cm.

25. $\mu = \dfrac{\text{Real depth}}{\text{Apparent depth}} = \dfrac{d}{x}$

$\therefore$ Due to first liquid, $\sqrt{2} = \dfrac{d}{x_1}$ or $x_1 = \dfrac{d}{\sqrt{2}}$

Due to the second liquid, $n = \dfrac{d}{x_2}$

$\therefore \quad x_2 = \dfrac{d}{n}$

$\therefore$ Total apparent depth $= x_1 + x_2 = \dfrac{d}{\sqrt{2}} + \dfrac{d}{n}$

$= \dfrac{d(n + \sqrt{2})}{n\sqrt{2}}$

27. For first minimum, putting n = 1 in the condition for minima given as

$d \sin\theta = \lambda$

we obtain: $d \sin\theta = \lambda$ ....(1)

where $\sin\theta \simeq \theta = \dfrac{x/2}{D} = \dfrac{x}{2D}$ ....(2)

From (1) and (2), we get ;

$\dfrac{\lambda}{d} = \dfrac{x}{2D}$

or

$x = \dfrac{2\lambda D}{d} = \dfrac{2 \times (600 \times 10^{-9}) \times 2}{10^{-3}}$

= 2.4 mm

29. $KE_f = \dfrac{1}{4} KE_i$

$\dfrac{1}{2} mV^2 = \dfrac{1}{4}\left(\dfrac{1}{2} mV_0^2\right)$

$V = \dfrac{V_0}{2}$

$V = u + at \quad (a = \mu g)$

$\dfrac{V_0}{2} = V_0 - \mu g t_0$

$\mu g\, t_o = \dfrac{V_0}{2}$

$\mu = \dfrac{V_0}{2gt_0}$

31. $\dfrac{4m_1m_2}{(m_1 + m_2)^2}$

33. $W = \dfrac{m(g\sin 30°)\ell}{2n^2}$

35. If length AB = x

$(mg \sin\theta + \mu mg \cos\theta)x$

$mgx\left(\dfrac{h}{x} + \dfrac{\mu\ell}{x}\right)$

37. $\dfrac{3}{v_{avy}} = \dfrac{1}{v} + \dfrac{1}{2v} + \dfrac{1}{3v}$

38. $PV = \frac{M}{M_W}RT$

$P \propto MT$

$\Rightarrow \frac{P_1}{P_2} = \frac{M_1T_1}{M_2T_2}$

$\Rightarrow \frac{720}{P_2} = \frac{M}{3M/4} \times \frac{313}{626}$

$P_2 = 1080\ kp_a$

39. For avoiding collision: $v_r < 0$

$U_r^2 + 2a_rS_r < 0$ [III Eq. in of motion]

$(V_1 - V_2)^2 + 2(-a)\, d < 0$

$(V_1 - V_2)^2 < 2ad$

$d > \frac{(v_1 - v_2)^2}{2a}$

40. $\eta = \frac{W}{Q} = 1 - \frac{T_2}{T_1}$

$= \frac{W}{6} = 1 - \frac{400}{500}$

$\Rightarrow W = 1.2$ Kcal

41. $H_1H_2 = \frac{u^2\sin^2\theta}{2g} \times \frac{u^2\cos^2\theta}{2g} = \left(\frac{u^2 2\sin\theta\cos\theta}{g}\right)^2 \times \frac{1}{16} = \frac{R^2}{16}$

$\therefore R^2 = 16H_1H_2 \Rightarrow R = 4\sqrt{H_1H_2}$

42. $\Delta Q = \Delta W + dU$

$100 = 20 + dU$

$dU = 80$ J

For Reverse

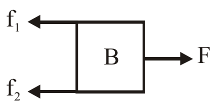
$dU_r = -80$

$\Rightarrow \Delta Q_r = \Delta W_r + dU_r$

$-20 = \Delta W_r - 80$

$\Delta W_r = 60$ J

43. $F = f_1 + f_2$



$= 0.2 \times 100 \times g + 0.3(100+200)g$

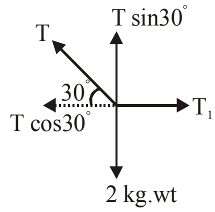
$= 1100$N

44. $\frac{Q}{t} = e_r\sigma A(T_4 - T_0^4)t$

$= 0.4 \times 5.67 \times 10^{-8} \times 200 \times 10^{-4}\ [800^4 - 300^4]$

$= 182$ J/sec.

45.



$T \sin 30° = 2$ ....(1)

$T \cos 30° = T_1$.............(2)

(1)÷(2)

$\tan 30° = \frac{2}{T_1}$

$T_1 = 2\sqrt{2}$ kg-wt.

46. $Ph-CH_2-O-Ph \xrightarrow{HI} Ph-CH_2-I + Ph-OH$

50. Gabriel phthalamide synthesis is used for preparation of aliphatic primary amines.

52. $Ph\,Mg\,Br \xrightarrow{CO_2} Ph-\overset{O}{\overset{\|}{C}}-\overset{\ominus}{O}\ \overset{\oplus}{Mg}Br$

$\xrightarrow{H_3O^{\oplus}} Ph-\overset{O}{\overset{\|}{C}}-OH$

58. $CH_3CH_2-Cl \xrightarrow{NaCN} CH_3-CH_2-CN$

$\xrightarrow[H_2]{Ni} CH_3CH_2CH_2 - NH_2$

$\downarrow CH_3-\overset{O}{\overset{\|}{C}}-O-\overset{O}{\overset{\|}{C}}-CH_3$

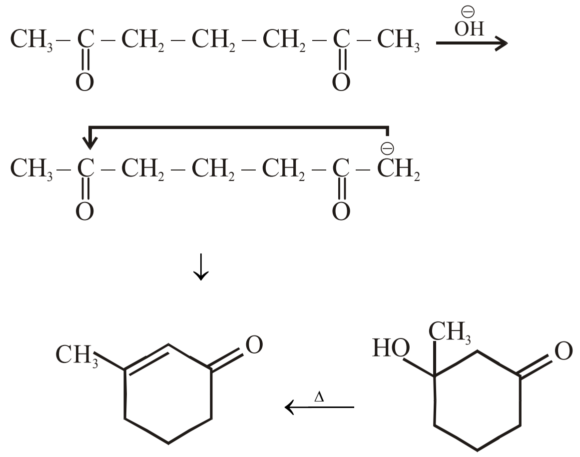
$CH_3CH_2-CH_2-NH-\overset{O}{\overset{\|}{C}}-CH_3$

60. $CH_3COOH \xrightarrow{PCl_5} CH_3-\underset{O}{\underset{\|}{C}}-Cl \xrightarrow[AlCl_3]{Ph-H}$

$Ph-\underset{O}{\underset{\|}{C}}-CH_3$

$\downarrow$ Et Mg Br, H_2O

$Ph-\underset{OH}{\underset{|}{\overset{Et}{\overset{|}{C}}}}-CH_3$

62. 

75. No. of moles = $\frac{\text{Gram amount of substance}}{M_w}$

No. of atoms = no. of moles × N_A

Gram amount is same for all M_w is minimu for B(s)

76. n° = A – Z

for S^{35}

n° = 35 – 16 = 19

77. If n = 4

$\ell = 0$

then m = (only)

78. $5e^- + 8H^+ + MnO_4^- \longrightarrow Mn^{+2} + 4H_2O$

79. $\boxed{S^1 = \frac{K_{sp}}{2C}}$

$C = \frac{10g}{111g/mol \times 1L}$

81. Option 4^{th} is of weak base remaining all are salts of SAWB which have pH less than seven

87. $K^1 = \frac{1}{\sqrt{K}}$

89. $\Delta G = \Delta G^\circ + 2.303\ RT\ \log_{10}Q$

91. NCERT (XII) Page # 187, Para = 1

93. NCERT (XII) Page # 176 , Para = 3

95. NCERT (XII) Page # 144 , Para = 2

97. NCERT (XII) Page # 187 , Para = 3

104. NCERT XI Pg # 137, 138, 139

106. NCERT XI Pg # 139

108. NCERT XII Page # 147

109. NCERT XI, Page No.# 22,23,24

111. NCERT XI, Page No.# 10

116. NCERT (XI), Page No. 114, 2^{nd} para

117. NCERT XI, Page No.# 38,39

118. NCERT (XI), Page No. 281, Last para

119. NCERT XI, Page No.# 14, Summary 2nd para

120. NCERT (XI), Page No. 102, 3^{rd} para

121. NCERT XI, Page No.# 43.

123. NCERT XI, Page No.# 37, Pteridophytes (d)

126. NCERT, Pg # 322

151. NCERT (XII), Pg # 168,169

153. NCERT (XI), Pg # 262,263

157. NCERT (XII), Pg # 168,169

160. NCERT(XI) Page no. 68, II^{nd} para

161. NCERT (XII), Pg # 228

164. NCERT(XI) Page no. 93, II^{nd} para

167. NCERT (XII) Page # 27 (Eng.)
Page # 28 (Hindi)

169. NCERT Page no. 50

171. NCERT Page no. 50

172. NCERT Page # 250

173. NCERT Page no. 51,53,57

175. NCERT Page no. 54

176. NCERT Page # 230

177. NCERT Page no. 55

178. NCERT Page # 212

179. NCERT Page # 189

180. NCERT Page # 196