MAJOR TEST # 08

ALLEN NEET-UG | **DATE : 25 - 04 - 2013**

FULL SYLLABUS

ANSWER KEY

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

HINT – SHEET

1. Component of $\vec{x}$ on $\vec{y}$ = $x\cos\theta$

$$= \frac{\vec{x}\cdot\vec{y}}{y} = \frac{(\vec{a}-\vec{b})\cdot(\vec{a}+\vec{b})}{|\vec{a}+\vec{b}|}$$

$$= \frac{a^2-b^2}{\sqrt{a^2+b^2}}$$

2. $w = 8\pi T(r_2^{\ 2} - r_1^{\ 2})$

$= 8\pi \times 0.03\ (25 \times 10^{-4} - 9 \times 10^{-4})$

$= 0.4\pi$ mJ

3. $a_{\text{after 50 s}} = \dfrac{F}{M_{\text{after 50 s}}} = \dfrac{v\frac{dm}{dt}}{1500-10\times50}$

$$= \frac{5000\times10}{1000} = 50 m/s^2$$

5. $T_P = M_{below} \times (g + a) = (3 + 5)(10 + 10) = 160N$

6. $8 = I_B R_B + V_{BE}$

$$\Rightarrow 8 = \left(\frac{4\times10^{-3}}{100}\right)R_B + 0.6$$

$\Rightarrow R_B = 185\ k\Omega$

9. $\dfrac{2u_y}{g} = \dfrac{2u_x u_y}{g} = \dfrac{\sqrt{3}}{g}$

$\therefore u_x = 1$ & $u_y = \dfrac{\sqrt{3}}{2}$

$$\therefore \tan\theta = \frac{u_y}{u_x} = \frac{\sqrt{3}}{2} \Rightarrow \theta = \tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$$

11. $\vec{v}_B = 2\vec{v}_A$

$\vec{v}_{CA} = x\hat{i} \Rightarrow \vec{v}_C - \vec{v}_A = x\hat{i}$ ... (1)

$\vec{v}_{CB} = x\hat{j} \Rightarrow \vec{v}_C - \vec{v}_B = x\hat{j}$

$\Rightarrow \vec{v}_C - 2\vec{v}_A = x\hat{j}$ ...(2)

Multiply eq. (1) by (2) and subtract eq. (2) from it

$2\vec{v}_C - 2\vec{v}_A - (\vec{v}_C - 2\vec{v}_A) = 2x\hat{i} - x\hat{j}$

$\vec{v}_C = 2x\hat{i} - x\hat{j}$

dir^n. $= E\tan^{-1}\left(\frac{x}{2x}\right)S = E\tan^{-1}\left(\frac{1}{2}\right)S$

13. $F_{avg} = \frac{\Delta p}{\Delta t} = \frac{2M(u+v)}{t}$

15. By COLM

$mu = 4mV \Rightarrow V = \frac{u}{4}$ .....(1)

By COME

$\frac{1}{2}mu^2 = \frac{1}{2}4mV^2 + mgh$

$\frac{1}{2}mu^2 = \frac{1}{2}4m\frac{u^2}{16} + mgh$

$\frac{mu^2}{2} - \frac{mu^2}{8} = mgh$

$u = \sqrt{\frac{8gh}{3}}$

17. Since $P' = n^3P$

$\because$ n = 3 $P' = 27P$

18. $M = \frac{f_o}{f_e} = 5 \quad \therefore f_o = 5f_e$

$f_o + f_e = 24 \quad 6f_e = 24$

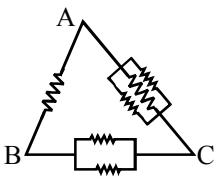
$\boxed{f_e = 4}$ and $\boxed{f_o = 20}$

20. u = –25 v = –50

$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} = \frac{1}{50}$

$\therefore$ P = 2D

22.



$R_{AB} = \frac{5R}{11}$, $R_{BC} = \frac{4R}{11}$

$R_{AC} = \frac{3R}{11}$

23. $a_r = \frac{g\sin\theta}{1 + K^2/r^2}$

For shell $\frac{K^2}{r^2} = \frac{2}{3}$

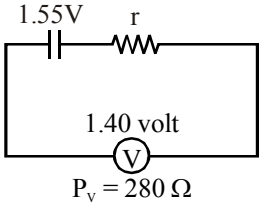
$a_r = \frac{3}{5}$ g sinθ ------- (1)

but a_S = g sin θ -------- (2)

dividing the two equations

$\frac{a_r}{a_S} = \frac{3}{5}$

24.



1.40 = 1.55 – ir ...(i)

but $i = \frac{1.55}{280 + r}$ ...(ii)

On solving we get

r = 30 Ω

25. Total distance covered by two wheels is same

$2\pi r_1 n_1 = 2\pi r_2 n_2$

or 0·5 × 200 = 0·1n_2 $\Rightarrow$ n_2 = 1000 rpm

26. Apply energy conservation

Energy at surface = Energy at height

$\frac{-GM_em}{R_e} + \frac{1}{2}m\left(\frac{v_e}{2}\right)^2 = \frac{-GM_em}{(R_e + h)}$

but $v_e^2 = \frac{2GM_e}{R_e}$

Hence $\frac{-GM_em}{R_e} + \frac{1}{4}\frac{GM_em}{R_e} = \frac{-GM_em}{R_e + h}$

Hence $R_e + h = \frac{4}{3}R_e$

$\boxed{h = \frac{R_e}{3}}$

27. sol. PV^{γ} = const. $\Rightarrow v^{\gamma} \propto \frac{1}{P}$

$TV^{\gamma-1}$ = constant $\Rightarrow V^{\gamma-1} \propto \frac{1}{T}$.

30. $T_{1/2} = 0.7\ RC$

$R = \frac{T_{1/2}}{0.7C} = \frac{70\times10^{-3}}{0.7\times2\times10^{-6}} = \frac{10^5}{2} = 5 \times 10^4$

$R = 50 \times 10^3\ \Omega = 50\ k\Omega$

31. $R_F \propto \frac{A}{MS} \propto \frac{1}{\rho s}$ [T, T_0, e_r, r = same]

33. $v_{rms} \propto \frac{1}{\sqrt{M_W}} \Rightarrow \frac{v_1}{v_2} = \sqrt{\frac{M_{W_2}}{M_{W_1}}}$

$\Rightarrow \frac{v}{\sqrt{2}v} = \sqrt{\frac{M_{W_2}}{32}} \Rightarrow M_{W_2} = 16(CH_4)$

38. No conduction is found between P & Q so both P & Q will be n-type or p-type. Therefore R will be base.

48. 20% by mass KI solu $\Rightarrow$
100 g solution contains 20 gm of KI
wt. of solvent = 100 – 20 = 80g

$\therefore$ Molality = $\frac{20\times1000}{166\times80}$

50. 0.2 m solu = 0.2 mol H_2S present in 1000g of H_2O (55.5 mol H_2O)

$X_{H_2S} = \frac{0.2}{55.5+0.2} = \frac{2}{557}$

$P = K_H X$ (at STP, P = 1 atm)

$1 = K_H \times \frac{2}{557}$

$\therefore K_H = \frac{557}{2} = 278.5$ atm.

58. $\frac{r_{CH_4}}{r_{HBr}} = \frac{P_{CH_4}}{P_{HBr}}\sqrt{\frac{M_{HBr}}{M_{CH_4}}}$

$\Rightarrow 1 = \frac{X_{CH_4}}{X_{HBr}}\sqrt{\frac{81}{16}}$

$\Rightarrow 1 = \frac{X_{CH_4}}{1-X_{CH_4}} \times \frac{9}{4}$

$\Rightarrow X_{CH_4} = \frac{4}{13} = 0.31$

60. Equal fraction in equal time
In 0.5 t if x left
then in t 'x^2' left

Here, $x^2 = \frac{1}{3}$

$\Rightarrow x = \frac{1}{\sqrt{3}}$

62. $\because P_{ext} = 0$
$\therefore w = -P_{ext}\, dU$
$= 0$

64. $\Delta_r H$ = Absorbed – Released
= (335 + 431) – (326 + 463)
= – 23 kJ

66. NCERT-XII Part I Pg. # 7

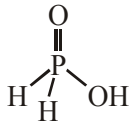
68. Y X

ccp $\frac{2}{3}\times8$

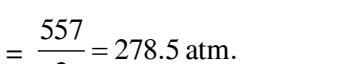
4

$X\frac{16}{3}Y.4$ or $X_{16}Y_{12}$ or X_4Y_3

77. NCERT part–I class XII Pg - 179

Hypophosphorus acid is  two p-H bonds.

79. Covalency of boron cannot be 6



81. NCERT XI, P-II, Page no. # 296,302

83. Na + liq. NH_3 is reducing agent.
NCERT XI, P-II, Page no. # 294

85. $NaHCO_3$ is sparingly insoluble (Solvay ammonia process)

99. NCERT-XI, Pg # 22, 23, 24

103. NCERT-XI, Pg # 38, 39

105. NCERT-XI, Pg # 43

107. NCERT - logical vertebrate examples
109. NCERT - 56
111. NCERT - 56, 52, 157
113. NCERT - 54
114. NCERT-XII, Pg # 183
115. NCERT-XI, Pg # 85
116. NCERT-XII, Pg # 208
117. NCERT-XI, Pg # 86 and 87
118. NCERT-XII, Pg # 199-200
119. NCERT-XI, Pg # 66
120. NCERT-XII, Pg # 200-201
121. NCERT-XI, Pg # 67
123. NCERT-XII, Pg # 22(E), 24(H)
125. NCERT-XII, Pg # 26(E), 28(H)
126. NCERT-XII, Pg # 116-117
127. NCERT-XI, Pg # 101, 102
128. NCERT-XII, Pg # 86
129. NCERT-XI, Pg # 305
131. NCERT-XI, Pg # 281
132. NCERT-XII, Pg # 70
133. NCERT-XI, Pg # 113,114
135. NCERT-XI, Pg # 114
137. NCERT-XI, Pg # 133, 134
139. NCERT-XI, Pg # 126
141. NCERT-XI, Pg # 163
146. NCERT-XII, Pg # 251
148. NCERT-XII, Pg # 245
151. NCERT-XII, Pg # 106, Para = 3
152. NCERT-XII, Pg # 233
153. NCERT-XII, Pg # 95, Para = 2
155. NCERT-XII, Pg # 103, Para = 4, 5
156. NCERT-XII, Pg # 216
157. NCERT-XII, Pg # 129, Para = 3
158. NCERT-XII, Pg # 204
159. NCERT-XII, Pg # 135, Para = 4
160. NCERT-XII, Pg # 187
161. NCERT-XII, Pg # 127, Para = 2
162. NCERT-XII, Pg # 183
163. NCERT-XII, Pg # 173, Para = 1
164. NCERT-XII, Pg # 47 (E), 51 (H)
165. NCERT-XII, Pg # 168 (Eng.)
168. NCERT-XII, Pg # 54,58,62,51 (E), 55,59,65,69(H)
169. NCERT-XI, Pg # 262,263 (Eng.)
171. NCERT-XI, Pg # 257 (Eng.)
172. NCERT-XII, Pg # 333
173. NCERT-XII, Pg # 228 (Eng.)
174. NCERT-XII, Pg # 325
178. NCERT-XI, Pg # 286