ENTHUSIAST COURSE

TARGET : PRE-MEDICAL 2014

ALLEN CAREER INSTITUTE KOTA (RAJASTHAN) Path to Success

MAJOR TEST # 01

ALLEN AIPMT (12TH Syllabus) | **DATE : 05 - 01 - 2014**

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

HINT – SHEET

3. $PF = \cos\phi = \frac{R}{Z}$

$\frac{R}{Z} = \frac{1}{\sqrt{2}}$

$2R^2 = R^2 + (R-X)^2$

$X = R$

$X_C = 20$

$C = \frac{1}{20\times100} = 500\ \mu F$

7. $\because\ dv = -\vec{E}.d\vec{r}$

$V_A - V_B = -[\vec{E}\cdot(\vec{r_A} - \vec{r_B})]$

$= -[(2\hat{i} + 3\hat{j})\cdot(-\hat{i} + \hat{j})]$

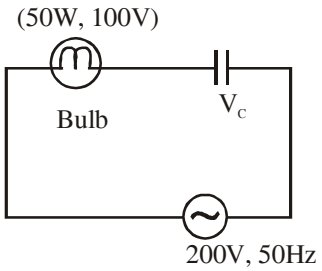
$= -1V$

8. $\because\ V^2 = V_R^2 + V_C^2$

$V_C^2 = (200)^2\ (100)^2$

$V_C = 100\ \sqrt{3}$ volt

current in bulb $I = \frac{P}{V} = \frac{50}{100}$



$I = \frac{1}{2}A$

$\because\ V_C = I\ X_C$

$X_C = \frac{100\sqrt{3}}{1/2} = 200\sqrt{3}$

$C = \frac{1}{200\sqrt{3}\times2\pi\times50}$

$C = \frac{50}{\pi\sqrt{3}}\mu F$

10. Here, wavelength, $\lambda = 6000$ Å $= 6000 \times 10^{-10}$ m;
slit width, a = 0.1 mm = 0.1×10^{-3} m
In case of diffraction at single slit, the position of minima is given by ;

$$a \sin \theta_n = n\lambda \text{ , where } n = 1,2,3,..$$

For second minimum, n = 2

$\therefore \quad a \sin \theta_2 = 2\lambda$

For small angle $\sin \theta_2 \approx \theta_2$

$$\therefore \quad \theta_2 = \frac{2\lambda}{a}$$

Substituting the values, we get;

$$\therefore \quad \theta_2 = \frac{2\times6000\times10^{-10}}{0.1\times10^{-3}} = 0.012 \text{ radian}$$

11. Vin = I Rin

$$= \frac{V_s}{200+100}\ 100$$

$$= \frac{5}{300}\times100 = \frac{5}{3}V$$

$V_0 = A_V \times V_{in}$

$$= 300 \times \frac{5}{3} = 500V$$

13. $q = q_0 \cos \omega t$

where $w = \frac{1}{\sqrt{LC}}$

15. From Brewster's law, $\mu = \tan i_p$ or $\frac{c}{\upsilon} = \tan 60°$

$$\therefore \quad \upsilon = \frac{3\times10^8}{\sqrt{3}} = \sqrt{3} \times 10^8 \text{ m/s.}$$

16. Applying 100p equations for left 100p

$2 = I_B (100 \times 10^3) + V_{BE}$

$I_B = 2 \times 10^{-5}$

$I_C = BIB$

$I_C = 100 \times 2 \times 10^{-5} = 2$ mA

for right loop

$V_{CC} = I_C R_C + V_{CE}$

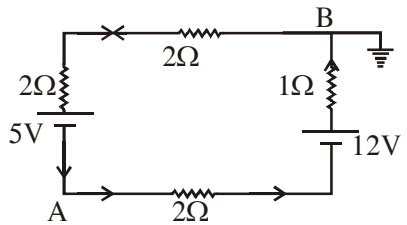
$9 = 2 \times 10^{-3} \times 2 \times 10^3 + V_{CE}$

$V_{CE} = 5V$

17. $W = PE [\cos \theta_1 - \cos \theta_2]$

27. $R_{eq} = 7\ \Omega$

$$I = \frac{E_{net}}{R_{eq}}$$



$$I = \frac{7}{7} = 1A$$

Apply KVL from A to B

$V_A + 5 + 1 \times 4 = V_B$

$V_1 = -9V$

42. W = change in potential energy of system

49. $[A]_t = -K_t + [A]_0$

$0.08 = -K \times 10 + 0.1$

$K = 0.002$

$$t_{1/2} = \frac{a}{2K} = \frac{0.1}{2\times0.002} = \frac{1\times1000}{20\times2} = 25 \text{ min}$$

$\because$ completion time $= 2 \times t_{1/2}$ (for zero order)
$= 2 \times 25 = 50$ min.

54. In absence of catalyst, $K_1 = Ae^{-100/RT}$

In presence of catalyst ; $K_2 = Ae^{-25/RT}$

$$\therefore \frac{K_2}{K_1} = e^{75/RT} \Rightarrow \log_e \frac{K_2}{K_1} = \frac{75}{RT}$$

$$\Rightarrow \log_{10} \frac{K_2}{K_1} = \frac{75}{2.303\times R\times T}$$

$$\Rightarrow \log_{10} \frac{K_2}{K_1} = \frac{75}{2.303\times8.314\times10^{-3}\times300}$$

$$= 13.057$$

59. $E_{OP} = E^o_{OP} - \frac{0.059}{2}\log_{10}(H^+)^2$

$E_{OP} = E^o_{OP} - 0.059 \log_{10} (H^+)$

$= E^o_{OP}{}^+ + 0.059 \times pH = 1.3 + 0.059 \times 3$

$= 1.3 + 0.177 = 1.477 = 1.48$ volt

64. Density (d) = $\frac{Z \times \text{at.wt.}}{N_A \times a_3}$

$\therefore$ For F.C.C, $d_1 = \frac{4 \times \text{at. wt.}}{N_A \times a_1^3}$

For B.C.C. $d_2 = \frac{2 \times \text{at. wt.}}{N_A \times a_2^3}$

$$\frac{d_1}{d_2} = \frac{4}{2} \times \frac{a_2^3}{a_1^3} = \frac{4}{5} \times \frac{(3.0 \times 10^{-8})^3}{(3.5 \times 10^{-8})^3} = 1.259$$

69. Factual

74. $\Lambda_{eq} = \frac{1}{R} \times \left(\frac{\ell}{A}\right) \times \frac{1000}{N}$

$= \frac{1}{25} \times \frac{2}{4} \times \frac{1000}{0.5}$

$= 40\Omega^{-1}cm^2eq^{-1}$

78. $\therefore K_a = \frac{C\alpha^2}{(1-\alpha)}$; $\alpha = \frac{\Lambda_m^c}{\Lambda_m^\circ}$

$$K_a = \frac{C \times \left(\frac{\Lambda_m^c}{\Lambda_m^\circ}\right)^2}{\left[1 - \frac{\Lambda_m^c}{\Lambda_m^\circ}\right]} = \frac{C \times (\Lambda_m^c)^2}{\Lambda_m^\circ(\Lambda_m^\circ - \Lambda_m^c)}$$

79. $\because d = \frac{Z \times M}{a^3 \times N_A}$ or $Z = \frac{d \times a^3 \times N_A}{M}$

$\therefore Z = \frac{2 \times (5 \times 10^{-8})^3 \times 6.0 \times 10^{23}}{75} = 2$

since the number of atoms per unit cell is 2 ; it indicates that the metal has body centred cubic (bcc) lattice.

$\because$ for bcc, $r = \frac{\sqrt{3}}{4} a = \frac{\sqrt{3}}{4} \times 5 = 2.16$ Å

83. NCERT XIII Part 1 Page 72
91. NCERT-XII Page No. 173
93. NCERT-XII Page No. 166
98. NCERT-XII Page No. 120
101. NCERT-XII Page No. 176
103. NCERT-XII Page No. 168, 169
104. NCERT-XII Page No. 50
107. NCERT-XII Page No. 122
108. NCERT-XII Page No. 181, 183, 185, 188
111. NCERT-XII Page No. 177
113. NCERT-XII Page No. 51
114. NCERT-XII Page No. 54
116. NCERT-XII Page No. 83
121. NCERT-XII Page No. 173
124. NCERT-XII Page No. 60
125. NCERT-XII Page No. 34(E) 36(H)
133. NCERT-XII Page No. 44
134. NCERT-XII Page No. 35(E) 37(H)
135. NCERT-XII Page No. 37(E) 39(H)
137. NCERT-XII Page No. 203
141. NCERT-XII, Page No. 132 Para 1, 2
144. NCERT-XII Page No. 34(E) 36(H)
145. NCERT-XII Page No. 74
146. NCERT-XII Page No. 86
147. NCERT-XII Page No. 211
151. NCERT-XII, Page No. 134 Para 3, 4
152. NCERT-XII Page No. 169
153. NCERT-XII Page No. 49
154. NCERT-XII Page No. 25, 27, 28, 34 (E) 27, 29, 36(H)
161. NCERT-XII, Page No. 134 Para 4
162. NCERT-XII Page No. 167
171. NCERT-XII, Page No. 137 Para 3
172. NCERT-XII Page No. 166
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