Path to Success
ALLEN CAREER INSTITUTE
KOTA (RAJASTHAN)

MAJOR TEST # 04

ALLEN NEET-UG | **DATE : 06 - 04 - 2013**

SYLLABUS - 04

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

HINT – SHEET

1. In an electric field, a force opposite to the direction of electric field acts on electron, so kinetic energy of photo electron increases.

2. $w_\theta = \frac{2\lambda}{d} = \frac{2\times 6000\times 10^{-10}}{12\times 10^{-5}\times 10^{-2}}$

$w_\theta = 1$ rad

3. Binding energy per nucleon of product nuclei is greater than parent nuclei (in fission and fussion)

4. NCERT Pg. # 367, Diffraction (10.6)

5. $\sum_{n=1}^{4} 2n^2 = 60$

6. Path difference = $n\lambda = (\mu - 1)t \Rightarrow t = \frac{n\lambda}{(\mu-1)}$

$= \frac{4\times 6000\times 10^{-10}}{(1.5-1)} = 4.8 \times 10^{-6}$ m

7. ${}^{64}_{29}Cu \rightarrow {}^{64}_{30}Zn + \beta^- + \bar{\upsilon}$.

8. NCERT Pg. # 364

$x = \frac{(2n-1)D\lambda}{2d}$

$\Rightarrow \lambda = \frac{2xd}{(2n-1)D} = \frac{2\times 1\times 10^{-3}\times 0.90\times 10^{-3}}{(2\times 2-1)\times 1}$

$\lambda = 6 \times 10^{-5}$ cm

10. $I = a_1^2 + a_2^2 + 2a_1a_2\cos\phi$

$= A^2 + (2A)^2 + 2(A)(2A)\cos 60° = 7A^2$

11. $A_{mix} = \frac{A_0}{2^3} + \frac{A_0}{2^2} = \frac{3}{8} A_0$.

12. $M = -\frac{f_0}{f_e} = -\frac{140}{5} = -28$

13. Maximum K.E. of photo electron does not depend on intensity

14. $A_0 = 1mm^2$ $f = 10$ cm
u = –9 cm

$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\frac{1}{v} - \frac{1}{(-9)} = \frac{1}{10}$

$\frac{1}{v} = \frac{1}{10} - \frac{1}{9}$ $\frac{1}{v} = \frac{9-10}{90}$

v = –90 cm

Magnitication (आवर्धन) (m) = $\frac{v}{u}$

$m = \frac{90}{9} = 10$

15. $R_0 = N_0\lambda$ $\because N_0 = 6.02 \times 10^{23}$ (in per mole)
$\therefore R_0 \propto \lambda$.

16. $f = 5$ cm, u = ?

for closest distance न्यूनतम दूरी के लिये	for farthest ditance अधिकतम दूरी के लिये
v = –25 cm	v' = ∞, u' = ?
$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$	$\frac{1}{f} = \frac{1}{v'} - \frac{1}{u'}$
$\frac{1}{5} = \frac{1}{-25} - \frac{1}{u}$	$\frac{1}{5} = \frac{1}{\infty} - \frac{1}{u'}$
$\frac{1}{u} = -\frac{1}{25} - \frac{1}{5}$	$\boxed{u' = -5cm}$
$\boxed{u = -4.2cm}$	

17. ${}^4_2He + {}^{14}_7N \rightarrow {}^1_1H + {}^b_aX$
a + 1 = 2 + 7 or a = 8
b + 1 = 4 + 14 or b = 17 = ${}^{17}_{18}O$

18. $f = \frac{D^2 - x^2}{4D}$

$= \frac{(90)^2 - (20)^2}{4 \times 90} = 21.4$ cm

19. $\frac{\upsilon_1}{\upsilon_2} = \sqrt{\frac{h\nu_1 - \theta_0}{h\nu_2 - \theta_2}} = \sqrt{\frac{1eV - 0.5eV}{2.5eV - 0.5eV}} = \frac{1}{2}$.

20. For a real image in convex lens ; minimum distance between the object and image should be $4f$. (उत्तल लैंस में वास्तविक प्रतिबिम्ब के लिये, वस्तु व प्रतिबिम्ब के मध्य न्यूनतम दूरी 4f होती है)
$4f = 3$m

$f = \frac{3}{4}$m = 0.75 m

22. M.P. = $-\frac{f_0}{f_e} = -\frac{144}{6}$

M.P. = –24
Length of the tube (नली की लम्बाई) = $f_0 + f_e$
= 144 + 6 = 150 cm

24. $\frac{1}{F} = \frac{1}{f_1} + \frac{1}{f_2} = \frac{1}{30} + \frac{1}{(-20)}$

= –60 cm

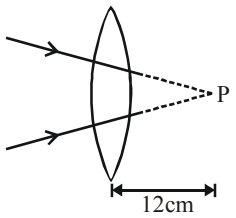
25. $p = \frac{h}{\lambda}$ = const. ($\because \lambda$ = const)

$E = \frac{p^2}{2m}$ or $E \propto \frac{1}{m}$.

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

$\frac{1}{v} - \frac{1}{(+12)} = \frac{1}{20}$

$\boxed{v = +7.5 \text{ cm}}$



27. $\frac{mv^2}{r} = evB$ or $mv = eBr$

de-Broglie wavelength $\lambda = \frac{h}{mv} = \frac{h}{eBr}$

28. Displacement current

$i_d = \epsilon_0 \frac{d\phi_e}{df}$, where $\phi_e = EA$

$i_d = \epsilon_0 \frac{d(EA)}{dt}$

$= \epsilon_0 A \frac{dE}{dt}$ .....(1)

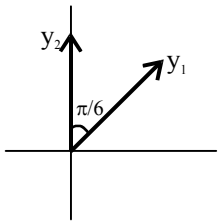
& $E = \frac{Q}{\epsilon_0 A}$

$\frac{dE}{dt} = \frac{dQ/dt}{\epsilon_0 A}$

$$\frac{dE}{dt} = \frac{i}{\epsilon_0 A} \text{ .....(2)}$$

from (1) & (2) $i_d = i = 0.15$ A

29.



30. Ref. em waves (NCERT)

31. $\frac{A}{2} = A\sin\omega t$

$\sin\omega t = \frac{1}{2}$

$\omega t = \frac{\pi}{6}$

$t = \frac{T}{12} = \frac{3}{12} = \frac{1}{4}$ sec

32. $B = \frac{E}{c_0} = \frac{6.3\,V/m}{3\times10^8\,m/sec} = 2.1 \times 10^{-8}T$

If direction of propogation of EM wave along + x direction, which must satisfied direction of $\vec{E}\times\vec{B}$ so $\vec{B}$ along + z direction.

33. $\sin\omega t = \frac{1}{2}$

$\therefore \sin^2\omega t = \frac{1}{4}$

$U = E_0\sin^2\omega t = 2.5$

$\frac{E_0}{4} = 2.5$

$\boxed{E_0 = 10J}$

34. $P_{avg.} = V_{rms}\, I_{rms} \cos\phi$

$= \frac{100}{\sqrt{2}} \times \frac{100}{\sqrt{2}} \times 10^{-3}\cos(\pi/3)$

$= 2.5$ W

35. In S.H.M. KE & PE change with double freq. of S.H.M.

36. $V = IR,\ R = \frac{V}{I} = \frac{100}{1} = 100\ \Omega$

$V = IZ,\ Z = \frac{V}{I} = \frac{100}{0.5} = 200\ \Omega$

$R^2 + X_L^2 = 200$

$X_L^2 = (200)^2 - (100)^2$

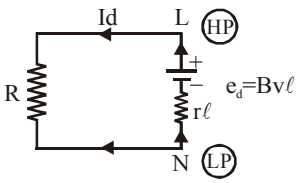
$X_L = 100\sqrt{3}$

$2\pi fL = 100\sqrt{3}$

$L = \frac{100\sqrt{3}}{2\pi\times50} = \frac{\sqrt{3}}{\pi}$ H

37. $\frac{\lambda}{4} = 20 \quad \Rightarrow 80$ cm

38. Equivalent CKT due to dynamic emi



Apply K.V.L. :-

$V_N - I_d(r\ell) + Bv\ell = V_L$

$V_L - V_N = Bv\ell - I_d\,(r\ell)$, where $I_d = \frac{Bv\ell}{R + r\ell}$

$V_L - V_N = Bv\ell - \frac{Bv\ell}{R + r\ell}\ (r\ell)$

$= Bv\ell\left(\frac{R}{R + r\ell}\right)$

39. $n \propto \sqrt{T}$

40. $V_{PQ} = 1/2\ B\omega[x^2]_\ell^{3\ell} = 4\ B\omega\ell^2$

$V_{RQ} = 1/2\ B\omega[x^2]_\ell^{2\ell} = 3/2\ B\omega\ell^2$

$\frac{V_{PQ}}{V_{RQ}} = \frac{4}{3/2} = \frac{8}{3}$

41. $n' = n\left(\frac{V}{V-\frac{V}{10}}\right)$

$n' = n\left(\frac{9}{10}\right)$

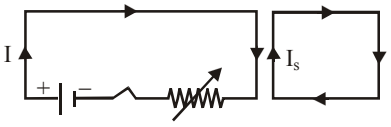
$\frac{n'}{n}=\frac{9}{10}$

42. In first and third situation its acceleration is $a < g$ due eddy currents. But in second situation its acceleration $a = g$ because at this time no eddy currents in it.
Although plate fall down through out with acceleration
So $v_3 > v_2 > v_1$.

43. $\Delta n = \frac{2nV_0}{V}$

$= \frac{2\times330\times2}{330} = 4$

44.



$I\uparrow \Rightarrow B\uparrow \Rightarrow \phi\uparrow \Rightarrow$ Repulsion
$\Rightarrow$ Unlike currents in parallel wire of ckt's for obs.
$\Rightarrow$ Clockwise induced currents for object

45. $\Delta L = 10\log\frac{I_2}{I_1} \Rightarrow \boxed{I \propto P}$

46. $E_{cell} = E^\circ_{cell} - \frac{0.059}{2}\log\frac{[\ ]_P}{[\ ]_R}$.

$= 1.05 - \frac{0.059}{2}\log\frac{[1]^2}{[1]}$.

$= 1.05$ V

47. $[Co(SO_4)(NH_3)_5]Br$ & $[Co(SO_4)(NH_3)_5]Cl$ represent no isomers.

48. NCERT Pg. # 69

50. NCERT Pg. # 69

54. Those species can disproportionate in which central atom shows intermediate oxidation state.

55. The complex formed will be $[Ni(NH_3)_6]^{+2}$.
Magnetic moment will be remain same = 2.8 B.M.

57. $[Cr(NH_3)_2(OH)_2Cl_2]^-$ can exhibit five GI, out of them Cis$[Cr(NH_3)_2(OH)_2Cl_2]$ can exhibit optical isomerism.

61. Formula of magnetite is Fe_3O_4 in which No Mg is present.

64. NCERT Pg. # 79

67. NCERT-XII Part-II Pg. # 444

68. Sb_2S_3 sol is (–ve) charged thus is coagulated by (+ve) charged and most effective is which having greater valency.

69. NCERT-XII Part-II Pg. # 446

70. NCERT Pg. # 139 and 140

71. NCERT-XII Part-II Pg. # 400

75. NCERT-XII Part-II Pg. # 410

77. NCERT-XII Part-II Pg. # 404

78. $\rho = \frac{n\times M_w}{V\times N_A}$

$\therefore\ n = \frac{2.75\times(654\times10^{-10})^3\times6\times10^{23}}{118}$

$n = 4$
So solid has F.C.C. structure

79. NCERT-XII Part-II Pg. # 399

82. $W = -P(V_2 - V_1)$
$= -1(22.4 - 11.2)$
$= -11.2$ Latm

84. NCERT-XII Part-II Pg. # 405

85. NCERT-XII Part-II Pg. # 434

86. NCERT-XII Part-II Pg. # 414

88. NCERT-XII Part-II Pg. # 420

89. NCERT-XII Part-II Pg. # 418

99. NCERT - Page No. # 227

100. NCERT Page # 243,244

102. NCERT Page # 276
104. NCERT Page # 256,249,233
106. NCERT Page # 249
108. NCERT Page # 249,246,244
110. NCERT Page # 244
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