Enthusiast, Leader & Achiever Course

PHASE : (All Phase)

TARGET : PRE-MEDICAL 2020

Test Type : **MAJOR** Test Pattern : **NEET (UG)**

TEST DATE : 09-05-2020

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

HINT – SHEET

1. Ans (4)

$$BC = \frac{\mu_0}{4\pi r}\left(\pi\left(\frac{2I}{3}\right) - \pi\left(\frac{I}{3}\right)\right) = \frac{\mu_0 I}{12r}$$

outward so direction is along $\hat{k}$

2. Ans (3)

Loop B: $\mu_0(2i - i) = \oint B.\,d\ell$

loop C: $\mu_0(i - 2i) = \oint B.\,d\ell$

Loop A: $\mu_0(3i - 3i) = \oint B.\,d\ell$

Loop D: $\mu_0(0 - i) = \oint B.\,d\ell$

$B > A > C = D$

3. Ans (1)

$$f = \frac{qB}{2\pi m} \Rightarrow B = \frac{2\pi mf}{q}$$

$$KE = \frac{q^2B^2r^2}{2m} = \frac{q^2r^2}{2m}\left(\frac{2\pi mf}{q}\right)^2$$

$$= 2\pi^2mf^2r^2$$

4. Ans (1)

$\tau = I\alpha = MB\sin\theta$

$$\theta = 90^\circ,\ \alpha = \frac{MB}{I} = \frac{i\pi R^2 B}{mR^2/2}$$

$$\alpha = \frac{i\pi B}{m} = \frac{2 \times 4 \times \pi \times 10}{2} = 40\pi$$

5. Ans (1)

$$\frac{\mu_0 i_1 i_2}{2\pi d} = \left(\frac{m}{\ell}\right)g$$

$$i_2 = \frac{m}{\ell} \times g \times \frac{2\pi d}{\mu_0 i_1}$$

$i_2 \approx 20A$

6. Ans (2)

For a loop at a point on its equitorial distant x from centre,

For x >> R,

Hence, $B = \frac{\mu_0 m}{4\pi x^3}$

7. Ans (4)

$m = IA = I\pi R^2$

$= (0.1) \times \pi \times (5 \times 10^{-2})^2$

$= 7.85 \times 10^{-4}$ amp-m^2

8. Ans (4)

$$T = 2\pi\sqrt{\frac{I}{MB}} \quad \Rightarrow \quad f \propto \sqrt{\frac{MB}{I}}$$

$$\frac{f_1}{f_2} = \sqrt{\frac{B_1 \cos 30}{B_2 \cos 60}} \quad \Rightarrow \quad \left(\frac{f_1}{f_2}\right)^2 = \frac{B_1}{B_2}\sqrt{3}$$

$$\Rightarrow \quad \frac{B_1}{B_2} = \left(\frac{20}{15}\right)^2\sqrt{3} = \frac{16}{9\sqrt{3}}$$

9. Ans (1)

A is feebly repelled ⇒ A is diamagnetic

B is feebly attracted ⇒ B is paramagnetic

C is strongly attracted ⇒ C is ferromagnetic

D remains unaffected ⇒ D is non-magnetic

10. Ans (1)

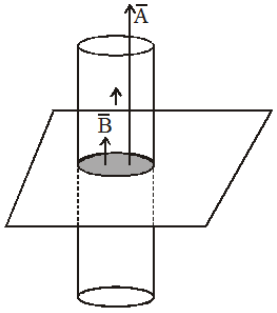
The efective magnetic field at O

$$B = B_{PE} + B_{RS} = \frac{\mu_0}{4\pi}\cdot\frac{3}{2}\frac{\pi I}{R} + \frac{\mu_0}{4\pi}\cdot\frac{\pi}{2}\cdot\frac{I}{2R}$$

$$\Rightarrow \quad B = \frac{\mu_0 I}{4R}\left[\frac{3}{2} + \frac{1}{4}\right] = \frac{7}{16}\frac{\mu_0 I}{R}$$

As per Fleming's Right Hand rule, direction of magnetic filed is perpendicular and in the plane of paper.

11. Ans (4)



Magnetic field due to the solenoid is along its length so $\theta = 0^\circ$

$\phi = B.A.$

$= 200 \times 15 \times 10^{-4}$

$= 0.3$ Wb

12. Ans (2)

$$e = \frac{d\phi}{dt} = \frac{d[(B)\pi r^2]}{dt} = 2\pi r B\left(\frac{dr}{dt}\right)$$

$= (2\pi)(2 \times 10^{-2})(2\times 10^{-3})(0.04) = 3.2\ \pi\mu V$

13. Ans (4)

Given B = 0.01 – 2t Tesla;

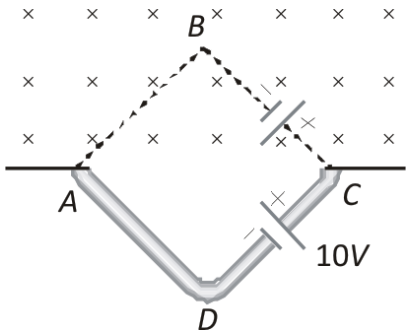
$\frac{dB}{dt} = -2\,\text{Tesla/sec}$,

Induced emf $e = -\frac{d\phi}{dt} = -\frac{d}{dt}(BA)$

$$= -A\frac{dB}{dt} = -\frac{1}{2}(1^2) \times (-2)$$

⇒ e = 1V

Since magnetic field (×) decreasing so according to Lenz's law direction of induced current in upper part of square will be clockwise i.e. from A to C or in other words emf induces in a direction opposite to the main emf so resultant emf = 10 – 1 = 9V.



14. Ans (1)

$\phi = MI \Rightarrow d\phi = M\,dI$

15. Ans (4)

$$\lambda = \frac{L}{R} = 10$$

$L = 10R$ ..... (1)

$$\frac{L}{R+10} = 2$$

$L = 2R + 20$ ..... (2)

from eq^n (1) & (2)

$10R = 2R + 20$

$$R = \frac{5}{2}$$

and L = 25H

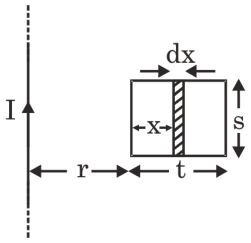
16. Ans (2)

$$e = M\frac{di}{dt} = 0.2 \times 5 = 1V$$

17. Ans (4)

In electromagnetic waves, electric field $\vec{E}$ and magnetic field $\vec{B}$ are perpendicular to the direction of wave. So direction of wave propagation is given by $\vec{E} \times \vec{B}$.

18. Ans (2)



$$\int d\phi = \int_0^t \frac{\mu_0 I}{2\pi(r+x)} \cdot s \; dx$$

$$\phi = \frac{\mu_0 I s}{2\pi} \int_0^t \frac{dx}{r+x}$$

$$\phi = \frac{\mu_0 I s}{2\pi} \ln(r+x)\Big|_0^t$$

$$\phi = \frac{\mu_0 I s}{2\pi} \ln\left(\frac{r+t}{r}\right)$$

$\phi \propto s$

19. Ans (3)

$I = 10 \sin 314\, t$

$< I^2 > = < 10^2 \sin^2 314\, t >$

$= 100 < \sin^2 314\, t >$

$= \frac{100}{2} = 50$

20. Ans (2)

$Z = 5\ \Omega \quad R = 4\ \Omega$

$X_L = \sqrt{Z^2 - R^2} = 3\Omega$

21. Ans (1)

$$Z_1 = \sqrt{B^2 + \frac{1}{(2\pi fc)^2}}$$

$$Z_2 = \sqrt{R^2 + \frac{1}{(2\pi(2f)\,c)^2}}$$

If $R << \frac{1}{2\pi fc}$, $\frac{Z_1}{Z_2} = 2$

If $R >> \frac{1}{2\pi fc}$, $\frac{Z_1}{Z_2} = 1$

so $1 < \frac{Z_1}{Z_2} < 2$

22. Ans (3)

$I_{rms} = 2A, \quad I_{rms} \sin\phi = A$

$I_{rms} \cos\phi = \sqrt{I_{rms}^2 - (I_{rms} \sin\phi)^2} = 1$

Power factor $= \cos\phi = \frac{1}{I_{rms}} = \frac{1}{2}$

23. Ans (4)

$P = \frac{V^2}{R} \Rightarrow V^2 = PR$

Now impedance is made = Z

$I = \frac{V}{Z}$, power $= I^2R$

Power $= \frac{V^2}{Z^2}R = \frac{PR^2}{Z^2}$

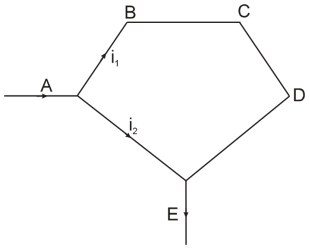
24. Ans (3)

$i_L = 5A \quad i_C = 2A$

$i_{LC} = I_L - I_C = 3A$

$X_{LC} = \frac{V_{LC}}{I_{LC}} = \frac{75}{3} = 25\Omega$

25. Ans (4)



$B_{AB} = B_{BC} = B_{CD} = B_{DE} = B_{EA} \qquad \frac{i_1}{i_2} = \frac{1}{4}$

Beacuse from V = IR

from above results $\vec{B}_{ABCDE} = -\vec{B}_{AE}$

So $B_{centre} = 0$

26. **Ans (4)**

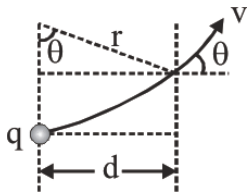
$B = \mu_0 \frac{N}{2\pi R_m} . I$ (given $R_m = 10$ cm)

27. **Ans (1)**

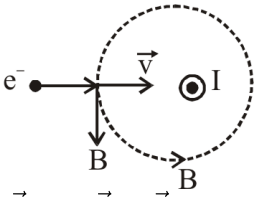
From figure it is clear that

$\sin\theta = \frac{d}{r}$ also $r = \frac{p}{qB}$

$\therefore \sin\theta = \frac{Bqd}{p}$



28. **Ans (2)**

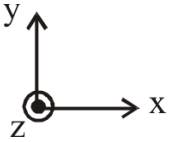


$\vec{F} = q\vec{V} \times \vec{B}$

$= -eV\hat{i} \times B(-\hat{j})$

$\vec{F} = eVB\hat{k}$

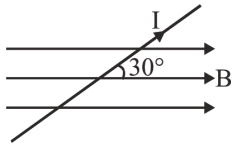
Force is vertically upwards perpendicular to plane of paper.



29. **Ans (4)**

According to the question, I = 8A, θ = 30°,

B = 1.5 T, ℓ = 1m



The magnitude of magnetic force

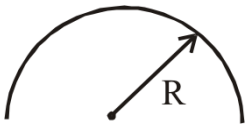
$F = BI\ell \sin\theta$

$= 1.5 \times 8 \times 1 \times \sin 30° = 6\ Nm^{-1}$

30. **Ans (2)**

If angle between normal and magnetic field is 90°, then plane of the coil is parallel to the magnetic field so according to the formula (BINA sinα), plane of the coil is Parallel to B

31. **Ans (2)**



$\pi R = \ell$

$M_{initial} = m\ell$

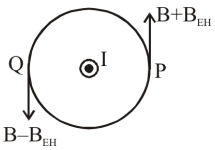
$M_{final} = m2R$

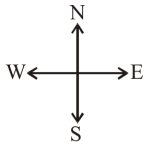
$\frac{M_{final}}{M_{initial}} = \frac{2R}{\ell} = \frac{2}{\pi}$

$M_{initial} = 3.14\ A\text{-}m^2$

$\Rightarrow M_{final} = 2\ A\text{-}m$

32. **Ans (1)**





Here B = Magnetic field due to wire

B_{EH} = Horizontal component of earth's magnetic field $\Rightarrow B_P > B_Q$

33. **Ans (2)**

Volume of rod = $10 \times 0.5 \times 0.2 \times 10^{-6} = 10^{-6}\ m^3$

$H = 0.5 \times 10^4\ Am^{-1}$, $M = 5\ Am^2$ B = ?

Intensity of magnetisation i.e.

$I = \frac{M}{V} = \frac{5}{10^{-6}} = 5 \times 10^6\ Am$

From $B = \mu_0 (I + H)$

Magnetic induction

i.e. $B = 4\pi \times 10^{-7} [5 \times 10^6 + 0.5 \times 10^4]$

$= 4\pi \times 10^{-7} \times 5 \times 10^6 = 20 \times 3.14 \times 10^{-1}$

$= 6.28\ T$

34. **Ans (2)**

Initially charged particle is coming close to loop when it passes, magnetic flux start to decrease. Initially it was increasing, so at the time of passes direction of induced current changes.

35. **Ans (2)**

$\left|\frac{d\phi}{dt}\right| = IR \Rightarrow |\Delta\phi| = IR\,\Delta t$

$|\Delta\phi| = 10 \times 10^{-3} \times 0.5 \times 5 = 25\ mWb$

36. Ans (1)

(1) λ_1 infra-red

(2) λ_2 radio-waves

(3) λ_3 x-rays

(4) λ_4 ultra-violet rays $\Rightarrow \lambda_2 > \lambda_1 > \lambda_4 > \lambda_3$

37. Ans (1)

$E.2\pi r = \pi a^2 \frac{dB}{dt}$

38. Ans (2)

$L_1 \frac{di_1}{dt} = L_2 \frac{di_2}{dt} \quad \Rightarrow \quad L_1 i_1 = L_2 i_2$

39. Ans (4)

$e = -M \frac{dI}{dt} = -M \frac{d}{dt} I_0 \sin \omega t$

$e = -M I_0 \omega \cos \omega t = -E_0 \cos \omega t$

$E_0 = MI_0\omega = 0.005 \times 2 \times 100\ \pi = \pi V$

40. Ans (1)

Green house effect is due to infrared rays

41. Ans (3)

$I_{rms}^2 = \langle 3^2 + 4^2 \sin^2 \omega t + 2 \times 3 \times 4 \sin \omega t \rangle$

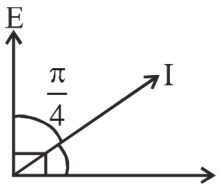
$= 3^2 + 4^2 \langle \sin^2 \omega t \rangle + 0$

$I_{rms}^2 = 9 + 16 \times \frac{1}{2} = 17$

42. Ans (1)

$E = 200 \sin (314t + \frac{\pi}{2})$

$I = \sin (314t + \frac{\pi}{4})$



43. Ans (3)

R Changed $\Rightarrow$ Z Changed $\Rightarrow$ I Changed

$V_L = I X_L$ (Changed)

$V_C = I X_C$ (Changed)

V_L and V_C are changed by same amount

So Voltage across LC combination ($V_L - V_C$) remains same.

44. Ans (1)

$P = ei = (E_0 \sin\omega t)\ \{(I_0 \sin(\omega t - \phi)\}$

$P = E_0 I_0 \sin \omega t (\sin \omega t \cos\phi - \cos \omega t \sin\phi)$

$P = E_0 I_0 (\sin^2 \omega t \cos\phi - \sin \omega t \cos \omega t \sin\phi)$

$\langle P \rangle = E_0 I_0 \langle \sin^2 \omega t \rangle \cos \phi - \frac{E_0 I_0}{2} < \sin 2\omega t$

$\langle P \rangle = \frac{E_0 I_0}{2} \cos \phi - 0$

45. Ans (1)

$\because$ total energy $= \frac{Q_0^2}{2C}$

$\frac{Q_0^2}{2C} = \frac{Q^2}{2C} + \frac{Li^2}{2} = \frac{Q^2}{2C} + 3\left(\frac{Q^2}{2C}\right)$

$\frac{Q_0^2}{2C} = \frac{4Q^2}{2C} \Rightarrow Q = \frac{Q_0}{2}$

Current at that instant = $Q\omega$

$i = \frac{Q_0}{2}\omega = \frac{Q_0}{2\sqrt{LC}}$.

47. Ans (4)

$[Fe(CN)_6]^{4-} \quad \Rightarrow Fe^{+2}$

eg

$\uparrow\downarrow\ \uparrow\downarrow\ \uparrow\downarrow\ t_{2g}$

51. Ans (3)

$NaCl + I_2 \rightarrow$ No Reaction

52. Ans (4)

The elements after $_{92}$Uramiun in P.T. is known as transuranic elements.

59. Ans (1)

Stability of higher oxidation state increases on moving down the group in a group of transition metal elements.

63. Ans (2)

$(Si_3O_9^{-6})$ means cyclic silicate.

70. Ans (1)

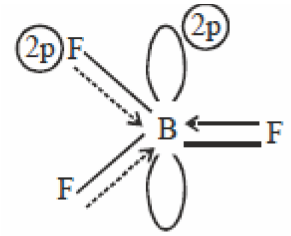
(1) $[Co(OX)_2(OH)_2] \Rightarrow Co^{+5}$ UPE = 2

(2) $[Ti(NH_3)_6]^{+3} \Rightarrow Ti^{+3}$ UPE = 1

(3) $[V(gly)_2(OH)_2(NH_3)_2]^{+} \Rightarrow V^{+5}$ UPE = 0

(4) $[Fe(en)(bpy)(NH_3)_2]^{+2} \Rightarrow Fe^{+2}$ UPE = 0

71. Ans (4)



Due to pπ-pπ back bonding, the vacant orbital of B accepts a lone pair of e^-. Hence, the B-F bonds in BF_3 becomes weakly acidic

81. Ans (1)

Due to synergic bonding B.O. of CO decreases.

82. Ans (2)

$Al_4C_3 + 12H–OH \rightarrow 4Al(OH)_3 + 3CH_4$

$Be_2C + 4H – OH \rightarrow 2Be(OH)_2 + CH_4$

83. Ans (3)

$$\Delta_t = \frac{4}{9} \times D_0$$

$$= \frac{4}{9} \times 20{,}000$$

$$= 8888.8 \text{ cm}^{-1}$$

86. Ans (3)

$BF_3 + 4H_2O \rightarrow H_3BO_3 + 3HF$

$3BF_3 + 3HF \rightarrow 3H(BF_4)$

$4BF_3 + 4H_2O \rightarrow H_3BO_3 + 3H(BF_4)$

Partical Hydrolysis

92. Ans (3)

NCERT XII, Pg # 212

95. Ans (1)

NCERT-XII, Page # 210 (12.2)

98. Ans (4)

NCERT XII Pg.# 212, 213

102. Ans (2)

NCERT XIIth Pg # 195

106. Ans (1)

NCERT-XII Pg. No. 194

110. Ans (2)

NCERT-XII, Page # 196 (11.2.1)

112. Ans (2)

NCERT Page # 197

114. Ans (4)

NCERT XII, Pg. # 182

126. Ans (3)

NCERT-XII, Pg# 176

128. Ans (4)

NCERT XII Pg. # 171

135. Ans (4)

NCERT XII Pg.# 183

145. Ans (1)

NCERT (XII) Pg. # 100

158. Ans (2)

NCERT Page # 121

170. Ans (1)

NCERT XII Pg.# 83 (E), Pg.# 91 (H)