ENTHUSIAST ADVANCE COURSE

PHASE : MEA, B, C, D, L, M, N, O, P & Q

TARGET : PRE MEDICAL 2025

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

TEST DATE : 13-12-2024

ANSWER KEY

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.	2	2	2	2	2	3	1	4	1	1	2	1	1	1	2	1	2	2	2	2	1	4	3	4	1	4	1	4	2	3
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.	3	3	4	1	4	1	1	3	4	3	3	1	1	3	2	1	2	2	2	1	2	2	3	1	1	2	1	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	2	3	3	3	3	2	2	2	2	3	2	2	4	2	3	2	2	3	3	1	3	2	2	2	1	4	4	2	4
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.	4	4	4	2	4	3	4	1	2	1	3	3	1	2	1	2	1	1	3	2	1	1	2	1	1	3	1	2	3	1
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.	1	1	2	4	1	4	2	4	4	4	4	2	4	2	3	4	3	3	2	2	1	4	2	3	4	3	1	1	4	1
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	2	3	1	2	4	1	2	2	4	2	1	1	2	2	4	2	3	2	2	1	3	3	3	2	1	4	3	4	2
Q.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200										
A.	1	4	1	1	2	2	1	4	3	1	2	4	1	2	2	2	2	2	3	1										

HINT – SHEET

SUBJECT : CHEMISTRY

SECTION-A

1. Ans (2)

Coordination number of Fe and Co are 6 and 6 respectively.

Both en and $C_2O_4^{-2}$ are symmetrical bidentate ligand.

2. Ans (2)

$[V(CO)_6]^-$ due to high e^- density in Metal, synergic bonding tendency increases so C – O bond order decreases.

3. Ans (2)

NCERT XII

Unit 9

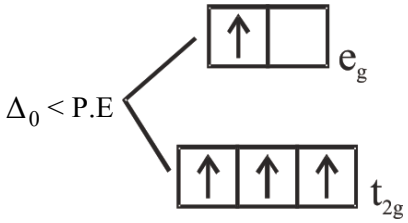
4. Ans (2)

NCERT Pg. # 249

5. Ans (2)

		unpaired e^-	
CrF_6^{4-}	Cr^{+2}	4	with WFL ligand
MnF_6^{4-}	Mn^{+2}	5	
$[Cr(CN)_6]^{4-}$	Cr^{+2}	2	with SFL ligand
$[Mn(CN)_6]^{4-}$	Mn^{+2}	1	

6. Ans (3)



7. **Ans (1)**

$[Fe(H_2O)_6]^{3+}$, H_2O is WFL

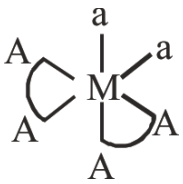
$\therefore$ Due to unpaired e^- more paramagnetic (Fe^{3+}, d^5)

$[Fe(CN)_6]^{3-}$, CN^- is SFL

$\therefore$ Electrons pair up so weak paramagnetic ($Fe^{3+} = d^5$)

8. **Ans (4)**

$M(AA)_2\ a_2$ shows G.I.



9. **Ans (1)**

cis form of

$[Pt(NH_3)_2Cl_2] \longrightarrow$ cisplatin

10. **Ans (1)**

Zn^{+2} belongs to iv group.

11. **Ans (2)**

$FeSO_4 + (NH_4)_2SO_4 \longrightarrow$

$FeSO_4(NH_4)_2SO_4.6H_2O$

or $(NH_4)_2Fe(SO_4)_2.6H_2O$

12. **Ans (1)**

chromyl chloride test

13. **Ans (1)**

$Cu_2[Fe(CN)_6]$

14. **Ans (1)**

NCERT XII

Unit 8

15. **Ans (2)**

$K_2Cr_2O_7 + 2H^+ + 4H_2O_2 \longrightarrow 2CrO_5 + 5H_2O$

16. **Ans (1)**

Diamagnetic species are generally colorless

17. **Ans (2)**

Unpaired e^-s are present in Gd^{3+} and Nd^{3+}

18. **Ans (2)**

size $\downarrow\downarrow$ (lanthanoid contraction)

19. **Ans (2)**

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20. **Ans (2)**

NCERT XII Pg. # 223

21. **Ans (1)**

In alkaline medium stable oxidation state of Mn is +6. So MnO4– is reduced to MnO_4^{-2} and I^- is oxidised to IO_3^-.

$6\ MnO_4^- + I^- + 6\ OH^- \longrightarrow 6\ MnO_4^{-2} + IO_3^- + 3H_2O$

22. **Ans (4)**

$KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O_2$

23. **Ans (3)**

$\overset{+4}{CO_2}$ can't reduce $KMnO_4$.

24. **Ans (4)**

Apply inert pair effect.

25. **Ans (1)**

$Cl_2 + H_2O \longrightarrow HCl + HOCl$

26. **Ans (4)**

Carbon show's +2 as well as +4 oxidation state.

27. **Ans (1)**

NF_3 is only trihalide

28. **Ans (4)**

SbH_3 will act as strongest reducing agent due to minimum bond enthalpy.

29. **Ans (2)**

High electronegativity, non availability of d-orbitals.

30. **Ans (3)**

Br_2 is weak oxidising agent

So it cannot oxidise F^-

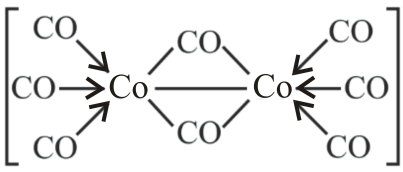
31. **Ans (3)**

As pere surface area.

SECTION-B

36. Ans (1)

NCERT XII, Unit 9, Pg # 255, Part-I



37. Ans (1)

Chelating ligands forms stable complex than monodentate ligands.

38. Ans (3)

Wilkinson catalyst - $[Rh(PPh)_3Cl]$

dsp^2 square planar. Rh $\Rightarrow$ 4d series.

So all ligand are S.F.L.

39. Ans (4)

Ligand field strength $\propto E_{abs} \propto \frac{1}{\lambda_{abs}}$

40. Ans (3)

NCERT XII 2017 Part-I, Page No. # 246

It is a type of Ma_5b complex where a and b are monodentate ligands, these complex do not show geometrical and optical isomerism. It can show only ionisation and linkage isomerism.

41. Ans (3)

$PbCl_2$ is soluble in hot water.

42. Ans (1)

NCERT XII

Unit - 8

43. Ans (1)

NCERT XII

Unit 8

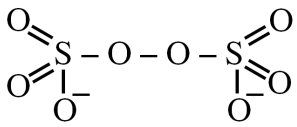
44. Ans (3)

Curium (at. no. 96) $[Rn]5f^7\ 6d^1\ 7s^2$

45. Ans (2)

$Mn^{+2} \longrightarrow 3d^5 \longrightarrow$ stable

46. Ans (1)

$S_2O_8^{-2}$ 

47. Ans (2)

Due to absence of vacant orbital in boron unable to increase covalency > 4

SUBJECT : BOTANY

SECTION-A

51. Ans (2)

NCERT Pg. # 89

52. Ans (2)

NCERT Pg.# 73

53. Ans (3)

NCERT Pg.# 67,68, 73

55. Ans (1)

NCERT XII, Pg. # 61

57. Ans (1)

NCERT Page No. - 71

58. Ans (1)

NCERT XII, Pg. # 70, 73

59. Ans (1)

NCERT, Pg. # 74, 75

60. Ans (3)

NCERT, Pg. # 69

61. Ans (1)

NCERT-XII, Pg. # 73

62. Ans (2)

NCERT Pg. # 62, 69, 74

63. Ans (3)

NCERT Pg. # 67

64. Ans (3)

NCERT Pg. # 69

65. Ans (3)

NCERT Pg. # 69

66. Ans (3)

NCERT Pg. No. # 57, 59, 64, 74

67. Ans (2)

NCERT Pg. # 61

68. Ans (2)
NCERT Pg. # 92 - 96

69. Ans (2)
NCERT Pg. # 102

70. Ans (2)
NCERT, Pg. # 80

71. Ans (3)
NCERT, Pg. # 89-90

72. Ans (2)
NCERT Pg. # 98

73. Ans (2)
NCERT Pg. # 106

74. Ans (4)
NCERT Pg # 85

75. Ans (2)
NCERT Pg # 85

76. Ans (3)
NCERT Pg. # 94, 99

77. Ans (2)
NCERT Pg. # 92

78. Ans (2)
NCERT Pg. # 93

79. Ans (3)
NCERT Pg. # 92

80. Ans (3)
NCERT Pg. # 92

81. Ans (1)
NCERT Pg. # 95

82. Ans (3)
NCERT Pg. # 96

83. Ans (2)
NCERT Pg.#100

84. Ans (2)
NCERT Pg. # 101

85. Ans (2)
NCERT Pg. # 86

SECTION-B

86. Ans (1)
NCERT Pg.# 74

88. Ans (4)
NCERT Page No. - 69 & 70

89. Ans (2)
NCERT Page No. - 70

90. Ans (4)
NCERT, Pg. # 72

91. Ans (4)
NCERT, Pg. # 74, 75

92. Ans (4)
NCERT, Pg. # 60, 61, 62

93. Ans (4)
NCERT Pg. # 60

94. Ans (2)
NCERT Pg. # 81, 83 & 84

95. Ans (4)
NCERT Pg. # 95 & 66

96. Ans (3)
NCERT, Pg. # 106

97. Ans (4)
NCERT Pg. # 90

98. Ans (1)
NCERT Pg. # 92–94

99. Ans (2)
NCERT Pg. # 95

100. Ans (1)
NCERT Pg. # 99

SUBJECT : ZOOLOGY

SECTION-A

101. Ans (3)
NCERT-XII Pg. # 195(E), 214(H)

102. Ans (3)
NCERT-XII Pg. # 199

103. Ans (1)
NCERT-XII Pg.# 201

104. Ans (2)
NCERT-XII Pg. # 168

105. Ans (1)
NCERT(XIIth) Pg # 203 (E), 220 (H)

106. Ans (2)
NCERT-XII Pg. # 199

108. Ans (1)
NCERT-XII, Pg. # 205

109. Ans (3)
NCERT-XII, Pg. # 195

111. Ans (1)
NCERT-XII Pg. # 213

113. Ans (2)
NCERT-XII, Pg. # 180

115. Ans (1)
NCERT-XII, Pg. # 184(E)/201(H)

116. Ans (3)
NCERT-XII Pg.#185 Para-2

117. Ans (1)
NCERT-XII Pg. # 183

118. Ans (2)
NCERT-XII Pg. # 184

119. Ans (3)
NCERT-XII Pg. # 185

120. Ans (1)
NCERT-XII Pg. No. # 179, 180, 182, 183

121. Ans (1)
NCERT-XII Pg. # 179

122. Ans (1)
NCERT-XII Pg. # 182

123. Ans (2)
NCERT-XII, Pg # 213

124. Ans (4)
NCERT-XII Pg. 183,184 (E) / 200 (H)

125. Ans (1)
NCERT-XII Pg. # 151

126. Ans (4)
NCERT-XII, Pg. # 158

127. Ans (2)
NCERT-XII Pg. # 157

128. Ans (4)
NCERT-XII, Pg. # 151

129. Ans (4)
NCERT-XII, Pg. # 152-153

130. Ans (4)
NCERT-XII Pg. # 156

131. Ans (4)
NCERT-XII Pg. # 152

132. Ans (2)
NCERT-XII Pg. # 187

134. Ans (2)
NCERT XII Pg. No. # 149

135. Ans (3)
NCERT-XII, Pg. # 153

SECTION-B

136. Ans (4)
NCERT-XII Pg. # 196

137. Ans (3)
NCERT XII Pg # 182, 183

138. Ans (3)
NCERT-XII Pg. # 194

139. Ans (2)
NCERT-XII, Pg. # 166, 169

141. Ans (1)
NCERT XIIth Pg. No. # 179

142. Ans (4)
NCERT-XII Pg. # 178

143. Ans (2)
NCERT-XII Pg. # 163, 164, 168, 172

145. Ans (4)

NCERT-XII Pg. # 179,180 (E)/196,197 (H)

146. Ans (3)

NCERT-XII Pg. # 163, 168, 175, 180, 184

147. Ans (1)

NCERT-XII Pg. # 183 (E) / 200 (H)

148. Ans (1)

NCERT-XII, Pg. # 151,152

149. Ans (4)

NCERT-XII Pg. # 151,154

150. Ans (1)

NCERT (XIIth) Pg. # 180 (E) , 197 (H)

SUBJECT : PHYSICS

SECTION-A

151. Ans (3)

$C = \nu \times \lambda$

$3 \times 10^8 = 15 \times 10^6 \times \lambda \Rightarrow \lambda_1 = 20m$

$C = \nu \times \lambda$

$3 \times 10^8 = 20 \times 10^6 \times \lambda \Rightarrow \lambda_2 = 15m$

$\therefore$ option (3) is correct

152. Ans (2)

$\frac{x_2}{x_1} = \frac{T_1}{T_2} \Rightarrow T_2 = 200\ K$

153. Ans (3)

The choke coil works as a resistance for A.C. current.

i.e $I = \frac{e.m.f}{X_L}$

The inductive reactance is directly propotional to the inductance & the frequency of circuit.

$\boxed{X_L = \omega L}$

154. Ans (1)

Conceptual

155. Ans (2)

$E = \frac{B\omega\ell^2}{2} = \frac{0.1\,(10)\,(0.5)^2}{2} = 0.125\ V$

156. Ans (4)

$mv = Bqr$

$r = \frac{\sqrt{2m(E)}}{Bq}$

$= \frac{\sqrt{2 \times 9 \times 10^{-31} \times 7.2 \times 10^{-18}}}{9 \times 10^{-5} \times 1.6 \times 10^{-19}}$

$= 0.25\ m \quad = 25\ cm$

157. Ans (1)

In AC circuit capacitor doesn't consume any power.

So, power is consumed by resistor only

$P = I_{rms}^2 R$ or $100 = (2)^2 R$

$\Rightarrow R = 25\Omega$

158. Ans (2)

$B = \frac{N\mu_0 i}{2R}$

$B_1 = \frac{N_1\mu_0 i}{2R_1}$

For $N_2 = 5$

Radius of coil $= R_2 = \frac{N_1 \times R_1}{N_2}$

$B_2 = \frac{N_2\mu_0 i}{R_2}$

$\frac{B_2}{B_1} = \frac{N_2}{N_1} \cdot \frac{R_1}{R_2} = \frac{N_2}{N_1} \times \frac{N_2}{N_1}; \frac{B_2}{B_1} = \frac{25}{4}$

159. Ans (2)

When the loop is drawn into the magnetic field, the area of the potion of the loop in the magnetic field will increase.

That means, the flux linkage increase. Therefore, an emf is induced in the loop so as to oppose the change that is to say to oppose the increase in magnetic flux in the loop. Therefore, the current will have to be induced in ACW direction to induce an opposing magnetic field, that is pointing outward of the page. After the complete entry of the loop into the magnetic field, no variation of flux occurs. Therefore, it induces no current so long as loop is completely inside the magnetic field. When it emerges out of the magnetic field, following the previous argument, the direction current in it will be reversed (clockwise).

Hence the correct answer is option (2)

160. Ans (4)

$e = 3t^2 + 3$

It is not in the form $y = 4ax^2$.

161. Ans (2)

$$\varepsilon = -B\frac{dA}{dt} = -B(2\pi r)\frac{dr}{dt}$$

162. Ans (1)

(A)Due to current carrying wire, the magnetic field in loop will be inwards the paper. As current is increased, magnetic flux associated with loop increases. So a current will be induced so as to decrease magnetic flux inside the loop. Hence induced current in the loop will be anticlockwise. The current in left side of loop shall be downwards and hence repelled by wire. The current in right side of loop is upwards and is hence attracted by wire. Since left side of loop is nearer to wire, repulsive force will dominate. Hence wire will repel the loop

(B) Options in (B) will be opposite of that in (A)

(C) When the loop is moved away from wire magnetic flux decreases in the loop. Hence the options for this case shall be same as in (B)

(D)When the loop is moved towards the wire magnetic flux increases in the loop. Hence the options for this case shall be same as in (A).

163. Ans (1)

$e = NBA\omega$

$$\frac{e_{circle}}{e_{square}} = \frac{A_{circle}}{A_{square}} = \frac{\pi\left(\ell^2/4\pi^2\right)}{\ell^2/16} = \frac{4}{\pi}$$

164. Ans (2)

The capacitive reactance is given by

$$X_C = \frac{1}{\omega C} = \frac{1}{100 \times 2 \times 10^{-6}} = 5 \times 10^3 \Omega$$

$$\because I = \frac{V}{X_C}$$

$$\Rightarrow I = \frac{300}{5 \times 10^3} = 60 \times 10^{-3} = 60\text{mA}$$

165. Ans (2)

$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

$$Z = \sqrt{2^2 + (4-2)^2} = 2\sqrt{2}\ \Omega$$

$$\Rightarrow i_{rms} = \frac{220/\sqrt{2}}{2\sqrt{2}} = \frac{220}{4} = 55\text{ A}$$

166. Ans (4)

Speed of the wave,

$$v = \frac{\omega}{k} = \frac{4 \times 10^8}{5} = 8 \times 10^7 \text{ms}^{-1}$$

$$E_0 = vB_0 = 8 \times 10^7 \times 5 \times 10^{-6}\text{V n}^{-1}$$

$$= 4 \times 10^2 \text{V m}^{-1}$$

167. Ans (2)

$$I = \frac{1}{2}\varepsilon_0 E_0^2 c$$

$$= \frac{1}{2} \times 8.85 \times 10^{-12} \times (56.5)^2 \times 3 \times 10^8$$

$$= 4.24\ \text{Wm}^{-2}.$$

168. Ans (3)

$E = E_0 \sin(kx - \omega t)$

$\langle E \rangle = 0$

$B = B_0 \sin(kx - \omega t)$

$\langle B \rangle = 0$

169. Ans (2)

The magnetic field inside the solenoid is given by

$B = \mu_0 nI$

Where, n = number of turns per unit length,

I = current in coil

Now, we have

$$n = \frac{N}{L} = \frac{400}{0.4} = 1000$$

and $\mu_0 = 4\pi \times 10^{-7}\text{T} - \text{m/A}$

$\therefore B = 4 \times 3.14 \times 1000 \times 5 \times 10^{-7}$

$= 62800 \times 10^{-7} = 6.28 \times 10^{-3}\text{T}$

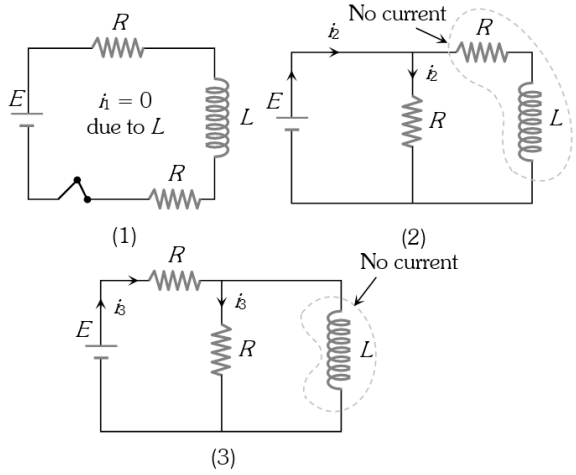
170. Ans (2)

$$r = \frac{mv\sin\theta}{qB}$$

$$= \frac{1.6\times10^{-27}\times2\times10^{5}}{1.6\times10^{-19}\times2}\sin30^{o} = 0.5\times10^{-3}\ m$$

171. Ans (1)

Just before closing the switch.



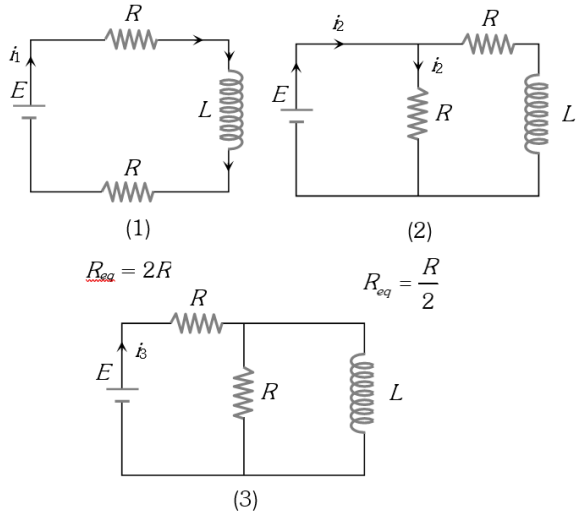
$i_1 = 0$,

$i_2 = \frac{E}{R}$,

$i_3 = \frac{E}{2R}$

so $i_2 > i_3 > i_1$ ($i_1 = 0$)

After a long time closing the switch



Hence $i_2 > i_3 > i_1$ $R_{eq} = R$

172. Ans (3)

Displacement current is due to change of electric flux with time.

173. Ans (3)

$$\text{Average emf} = \frac{\text{Change in flux}}{\text{Time}} = -\frac{\Delta\phi}{\Delta t}$$

$$= -\frac{0-(4\times(2.5\times2)\cos60^{\circ})}{10}$$

$$= +1V$$

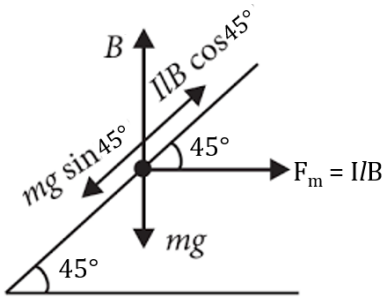
174. Ans (3)

$$\lambda = \frac{12400}{10000} = 1.24\ \text{Å}$$

175. Ans (2)

Theoretical fact.

176. Ans (1)



For the rod to remain stationary,

$Mg\sin45^{\circ} = IlB\cos45^{\circ}$

$$I = \left(\frac{M}{l}\right)\frac{g}{B}\tan45^{\circ} = \frac{0.45\times10\times1}{0.15}A = 30A.$$

177. Ans (4)

Magnetic dipole moment is a vector quantity, and they are at angle of 90^{o}.

Thus, they can be added as perpendicular vectors.

$M = \sqrt{M_1^2 + M_1^2}$

$N = \sqrt{3^2+4^2} = 5$

178. Ans (3)

Suppose length of each wire is ℓ.

$$A_{square} = \left(\frac{\ell}{4}\right)^2 = \frac{\ell^2}{16}$$

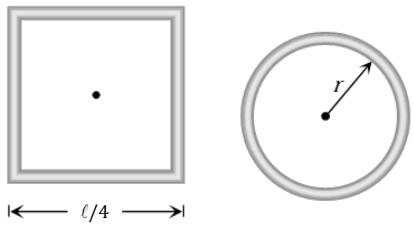
$$A_{cirde} = \pi r^2 = \pi\left(\frac{\ell}{2\pi}\right)^2 = \frac{\ell^2}{4\pi}$$

$\therefore$ Magnetic moment

$M = iA$

$$\Rightarrow \frac{M_{square}}{M_{circle}} = \frac{A_{square}}{A_{circle}}$$

$$= \frac{\ell^2/16}{\ell^2/4\pi} = \frac{\pi}{4}$$



179. Ans (4)

As power factor, $\cos\phi = 0.5$, $\phi = 60°$.

180. Ans (2)

Direction of propagation,

$\hat{c} = \hat{E} \times \hat{B} = \hat{i} \times \hat{k} = -\hat{j}$

181. Ans (1)

Current increases in a step-down transformer.

182. Ans (4)

Magnetic flux linked with a coil, $\phi = NBA\cos\phi$

Since the magnetic field B is parallel to the area A, i.e.,

$\theta = 90°$

$\therefore \phi = 0.$

183. Ans (1)

Both assertion and reason are true and reason is the correct explanation of assertion.

Torque due to magnetic field is given by:

$\tau = MB\sin\theta$

when $\theta = 90°$, τ is maximum.

184. Ans (1)

$$\frac{\mu_0(2I)}{2\pi x} = \frac{\mu_0(8I)}{2\pi(30-x)}$$

$\Rightarrow 4x = 30 - x \Rightarrow x = 6$ cm from point A

185. Ans (2)

$$\frac{1}{2}\varepsilon_0 E^2 = \frac{B^2}{2\mu_0}$$

$\because E = CB$

$$C = \frac{E}{B} = \frac{1}{\sqrt{\mu_0\varepsilon_0}}$$

SECTION-B

186. Ans (2)

(A) $\frac{V_S}{V_P} = \frac{N_S}{N_P} = 4 \Rightarrow \frac{V_S}{200} = 4 \Rightarrow V_S = 800$ V

(B) For ideal transformer

$P_{in} = P_{out}$

$V_p.I_P = V_s.I_s$

$200 \times 1 = 800 \times I_S \Rightarrow I_S = 0.25$ A

(C) 80% Efficiency

$$\eta = \frac{P_{out}}{P_{in}} \times 100 = \frac{V_S I_S}{V_P I_P} \times 100$$

$$0.8 = \frac{800 \times I_S}{200 \times 1} \Rightarrow I_S = 0.2 \text{ A}$$

(D) Since $N_S > N_P \Rightarrow$ S.U.T.

187. Ans (1)

$Q = CV$

$$I_C = \frac{dQ}{dt} = C\frac{dV}{dt} = 20 \times 10^{-6} \times 3\text{A}$$

$= 60 \times 10^{-6}$ A $= 60$ μA

$I_D = I_C = 60$ μA.

188. Ans (4)

$M = \mu_0 n_1 n_2 \pi r_1^2$

$L = \mu_0 n_1^2 \pi r_1^2$

$\Rightarrow \frac{M}{L} = \frac{n_2}{n_1}$.

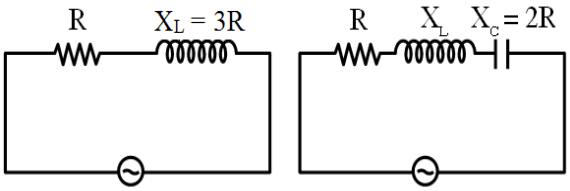
189. Ans (3)

$B = \frac{\mu_0}{2R}\frac{2}{T}$

$\frac{\mu_0}{2\times 8} \times \frac{2\times 1.6\times 10^{-19}}{1}$

$= 2\,\mu_0 \times 10^{-19}\ T$

190. Ans (1)



$\cos\phi = \frac{R}{\sqrt{R^2+9R^2}}$ $\cos\phi' = \frac{R}{\sqrt{R^2+R^2}}$

$= \frac{1}{\sqrt{10}}$ $= \frac{1}{\sqrt{2}}$

$\frac{\cos\phi'}{\cos\phi} = \frac{\sqrt{10}}{\sqrt{2}} = \frac{\sqrt{5}}{1}$ $\therefore x = 1$

191. Ans (2)

$B_{inside} = \frac{\mu_0 Ir}{2\pi R^2}$ [use $I = J(\pi R^2)$]

$B_{inside} = \frac{\mu_0 J(\pi R^2) r}{2\pi R^2} = \frac{\mu_0 Jr}{2}$

$= \frac{4\pi\times 10^{-7}\times 100\times 2\times 10^{-3}}{2} = 4\pi\times 10^{-8} T$

192. Ans (4)

Q-factor of this circuit,

$Q = \frac{1}{R}\sqrt{\frac{L}{C}} = \frac{1}{10}\sqrt{\frac{2}{32\times 10^{-6}}} = \frac{10^3}{40} = 25$

193. Ans (1)

$\in_r = 2$

$\mu_r = 2.5$

$n = \sqrt{2\times 2.5}$

$= \sqrt{5}$

194. Ans (2)

$\frac{1500}{4\pi(3)^2} = \frac{1}{2}\frac{E_0^2}{\mu_0 C}$

$\Rightarrow E_0 = \sqrt{\frac{1500\times 4\pi\times 10^{-7}\times (3\times 10^8)}{4\pi\times (3)^2}}$

$E_0 = \sqrt{10^4} = 100\ \frac{volt}{m}$

195. Ans (2)

$W = MB(\cos\theta_1 - \cos\theta_2)$

$= 2\ MB$

$= \cancel{2}\times\frac{5}{\cancel{2}}\times 0.2$

$= 1\ J$

196. Ans (2)

We know that $i = i_0[1 - e^{\frac{-Rt}{L}}]$ or

$\frac{3}{4}i_0 = i_0[1 - e^{-t/\tau}]$

(where $\tau = \frac{L}{R}$ = time constant)

$\frac{3}{4} = 1 - e^{-t/\tau}$ or $e^{-t/\tau} = 1 - \frac{3}{4} = \frac{1}{4}$

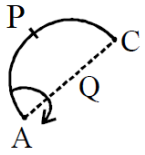
$e^{t/\tau} = 4$ or $\frac{t}{\tau} = \ell n4$

$\Rightarrow \tau = \frac{t}{\ell n4} = \frac{4}{2\ell n2} \Rightarrow \tau = \frac{2}{\ell n2}$ sec.

197. Ans (2)

We connect a conducting wire from A to C & complete semi circular loop.

$\therefore$ emf of section APC + emf of section CQA = 0.



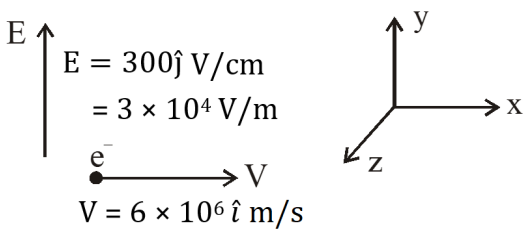
$\therefore$ emf of section APC

= emf of section AQC = $2B\omega R^2$

198. Ans (2)

The magnetic dipole moment will be reduced to half when broken into two equal pieces and every atom behaves like a dipole so the dipole of a magnet cannot be separated.

199. Ans (3)



$\vec{E} = 300\hat{j}$ V/cm = 3×10^4 V/m

$\vec{V} = 6 \times 10^6\hat{i}$

$\vec{B}$ must be in +z axis.

$q\vec{E} + q\vec{V} \times \vec{B} = 0$

$E = VB$

$\therefore \quad B = \frac{E}{V} = \frac{3 \times 10^4}{6 \times 10^6} = 5 \times 10^{-3}T$

Hence, magnetic field $B = 5 \times 10^{-3}$ T along +z direction.

200. Ans (1)

$Q = CV = C\,(Bvl)$

$= 10 \times 10^{-6} \times 4 \times 2 \times 1 = 80\ \mu C$

According to Fleming's right hand rule induced current flows from Q to P. Hence P is higher potential and Q is at lower potential. Therefore A is positively charged and B is negatively charged.