LEADER & ACHIEVER COURSE

PHASE : MLA, MLB, MLC, MLQ, MLR, MLS, MLT, MLU, MLV, MAZA, MAZB, MAZC, MAZD, MAZE, MAZF, MAZP, MAZQ & MAZR

TARGET : PRE-MEDICAL 2024

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

TEST DATE : 21-03-2024

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

HINT – SHEET

SUBJECT : PHYSICS

SECTION-A

1. Ans (3)

$$\text{emf} = \frac{-d\phi}{dt}$$

2. Ans (4)

$$|e| = -\frac{dQ}{dt}$$

$$e = \frac{d}{dt}(NBA)$$

$$e = N.A\ \frac{dB}{dt}$$

$$e = 500 \times (10\times10^{-2})^2 \times 1$$

$$\boxed{e = 5 \text{ volt}}$$

3. Ans (3)

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

$$= (0.025)(2\pi)(2 \times 10^{-2})(10^{-3}) = \pi\mu V$$

4. Ans (2)

Induced emf $e = -L\frac{di}{dt}$

5. Ans (1)

Magnetic energy

$$U = \frac{1}{2}LI^2 \Rightarrow L = \frac{2U}{I^2} = \frac{2\times648}{9\times9} = 16H$$

Induced emf $e = L\left(\frac{\Delta I}{\Delta t}\right)$

$$= 16 \times \frac{9}{0.45} = 320V$$

6. Ans (4)

$$L = \frac{\mu_0 N^2 A}{\ell}$$

7. Ans (2)

Just after switch is closed inductor offer infinite resistance (i.e. open circuit)

(i) $I = 0$ (ii) $I = \frac{E}{R}$ (iii) $I = \frac{E}{2R}$

8. **Ans (2)**

$\because K = \frac{\phi_S}{\phi_P}$

If K = 1 then

$\phi_s = \phi_p$

9. **Ans (2)**

$F = \frac{B^2 v \ell^2}{R}$

10. **Ans (4)**

ac generator is based on the principle of the electromagnetic induction. When a coil is rotated about an axis perpendicular to the direction of uniform magnetic field, an induced emf is produced across it.

11. **Ans (4)**

$\eta = \frac{P_{out}}{P_{in}} \times 100$, where $P_{in} = V_P I_P$

$= \left(\frac{100}{220 \times 0.5}\right) \times 100 = 90\%$

12. **Ans (1)**

$I = \frac{P}{4\pi r^2} \simeq 0.23\ mW/m^2$

13. **Ans (2)**

Radiation pressures = $\frac{2I}{C}$

Force $F = \frac{2I}{C}A$,

Momentum = $Ft = \frac{2I}{C}At = \frac{2E}{C}$

14. **Ans (3)**

Intensity, $I = \frac{Power}{area} = \frac{P}{4\pi r^2}$ = average energy

density × velocity = $\frac{1}{2}\varepsilon_0 E_0^2 c$

$\therefore \quad E_0 = \sqrt{\frac{2P}{4\pi\varepsilon_0 r^2 c}} = \sqrt{\frac{P}{2\pi\varepsilon_0 r^2 c}}$

15. **Ans (1)**

$r = \frac{\sqrt{2mk}}{qB} = \frac{\sqrt{2mqV}}{qB}$

$r = \frac{1}{B}\sqrt{\frac{2mV}{q}}$

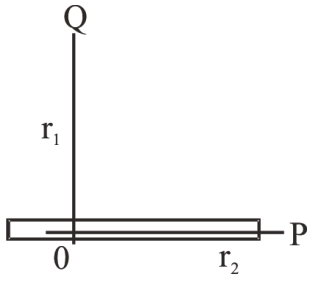
$r \propto \sqrt{\frac{m}{q}}$

16. **Ans (1)**

$B_1 = \frac{r_0 M}{4\pi r_1^3}$

$B_2 = \frac{2\mu_0 M}{4\pi r_2^3}$

According to question



$B_1 = B_2$

$\frac{r_1}{r_1} = (2)^{1/3}$

17. **Ans (1)**

$F = 3\times F_{CD}$

$= 3 \times IBL$

$= 3\times2\times4\times1$

$= 24$ N

18. **Ans (2)**

The magnetic field of a solenoid is given by,

$B = \frac{1}{2}\mu_0 nI[\cos\theta_1 - \cos\theta_2]$

For a very long current carrying solenoid, the magnetic filed at the ends of a very long solenoid is given by ,

$B = \frac{1}{2}\mu_0 nI = \frac{1}{2} \times$ Magnetic field at the centre

[$\because \theta_1 = 90°, \theta_2 = 180°$]

19. **Ans (2)**

$B = \frac{\mu_0 I}{2\pi d} \Rightarrow B \propto \frac{1}{d}$

20. **Ans (1)**

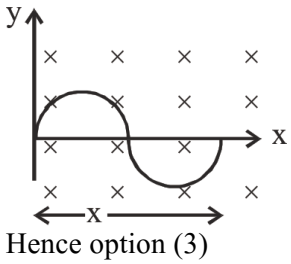
Sensitivity = $\frac{\theta}{i} = \frac{NAB}{C}$

21. **Ans (3)**

$x_{eff} = 2L$

so $F = IB\ X_{eff}$

$F = 2IBL$



Hence option (3)

22. Ans (2)

$\frac{B_{centre}}{B_{axis}} = \left(1 + \frac{x^2}{R^2}\right)^{3/2}$, also $B_{axis} = \frac{1}{8} B_{centre}$

$\Rightarrow \frac{8}{1} = \left(1 + \frac{x^2}{R^2}\right)^{3/2} \Rightarrow 2 = \left(1 + \frac{x^2}{R^2}\right)^{1/2}$

$\Rightarrow 4 = 1 + \frac{x^2}{R^2} \Rightarrow 3 = \frac{x^2}{R^2} \Rightarrow x^2 = 3R^2$

$\Rightarrow x = \sqrt{3}R$

23. Ans (4)

Conceptual

24. Ans (1)

$\vec{v} = \left(2\hat{i} + 3\hat{j}\right) \quad \vec{B} = 4\hat{j}$

$\theta \neq 90°, 0°, 180°$

so path will be helix

25. Ans (3)

$F_{Net_C} = F_D - F_C$

$= \frac{\mu_0(30)}{2\pi(3 \times 10^{-2})} - \frac{\mu_0(20)}{2\pi(2 \times 10^{-2})}$

$= \frac{\mu_0(10)}{2\pi \times 10^{-2}} - \frac{\mu_0(10)}{2\pi \times 10^{-2}}$

$= 0$ N

26. Ans (3)

A – s, B – q, C – p, D – r

27. Ans (2)

$B = \mu H \Rightarrow 8 \times 10^{-3} \times 160 = 1.28$ Wb/m^2

28. Ans (4)

$I = 100 \sin(200\pi t)$

$\Rightarrow \quad 100 = 100 \sin(200\pi t)$

$\Rightarrow \quad \sin(200\pi t) = 1$

$200\pi t = \frac{\pi}{2}$

$t = \frac{1}{400}$ sec

29. Ans (3)

$R_{Coil} = \frac{V_{D.C.}}{I_{D.C.}} = \frac{100}{25} = 4\Omega$

Also $Z = \frac{V_{rms}}{I_{rms}} = \frac{100}{20} = 5\Omega$

$Z^2 = X_L^2 + R^2$

$X_L = \sqrt{Z^2 - R^2} = \sqrt{5^2 - 4^2} = 3\Omega$

$X_L = 2\pi fL$

$L = \frac{3}{2\pi(50)} \simeq 9.5$mH

30. Ans (2)

We know that $X_C = \frac{1}{2\pi fc}$

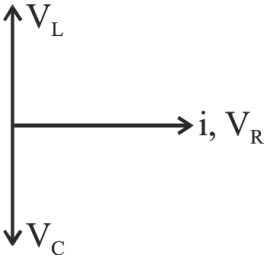
$X_C \propto \frac{1}{f}$: so the graph b/w then will be straight line.

31. Ans (1)

$V = \sqrt{V_R^2 + V_C^2}$

$\tan\phi = \frac{V_C}{V_R}$

32. Ans (4)



33. Ans (3)

p.f. $= \cos\phi = \frac{1}{\sqrt{2}} = \frac{R}{Z}$

$\Rightarrow Z = \sqrt{2}R \Rightarrow Z = 10\sqrt{2}\Omega$

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

where $X_L = \omega L = (100)(0.1) = 10\ \Omega$

$200 = 100 + (X_C - 10)^2$

$\Rightarrow X_C = 20\Omega$

$\Rightarrow \frac{1}{100C} = 20$

$\Rightarrow C = 500\ \mu$F

34. Ans (1)

For better tuning, Q-factor must be high.

$\therefore Q = \frac{\omega_o L}{R} = \frac{1}{\sqrt{LC}}\left(\frac{L}{R}\right) = \frac{1}{R}\sqrt{\frac{L}{C}}$

R and C should be small and L should be high.

35. Ans (1)

Chock coil has high X_L and low resistance.

Hence $i = \frac{V}{Z}$ is very low.

SECTION-B

36. Ans (1)

Induced emf = $\frac{(B_1 - B_2)A}{\Delta t}$

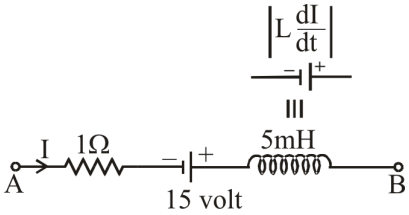
$= \frac{(2-1)\times 0.01}{10^{-3}} = 10V$

Heat produced in resistance R = 0.01 Ω in time

$\Delta t = 10^{-3}$ S is

$H = \left(\frac{V^2}{R}\right)\Delta t = \frac{(10)^2}{0.01} \times 10^{-3} = 10J$

37. Ans (2)



From KVL A to B

$V_A - (1 \times 5) + 15 + (5 \times 10^{-3})10^3 = V_B$

$V_B - V_A = +15$ volt

38. Ans (1)

$V_L = V_0 e^{-t/\tau}$, $V_R = V_0(1 - e^{-t/\tau})$

39. Ans (4)

$\varepsilon = \int_{\frac{L}{2}}^{L} B\,(x\,\omega)\,dx$

40. Ans (4)

$cB_0 = E_0$

$B_0 = \frac{E_0}{c} = \frac{1.2}{3\times 10^8} = \mu_0 H$

$\Rightarrow H_0 = \frac{B_0}{\mu_0} = \frac{1.2}{3\times 10^8 \times 4\pi \times 10^{-7}}$

$H_0 = \frac{10^{-2}}{\pi}\ Am^{-1}$

41. Ans (1)

Fact and data

42. Ans (4)

The equation of electric field occurring in

Y-direction $E_y = 66\cos 2\pi \times 10^{11}\left(t - \frac{x}{c}\right)$

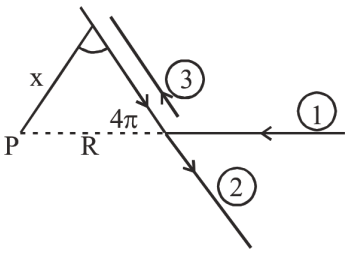
Therefore, for the magnetic field in Z-direction

$B_z = \frac{E_y}{c} = \left(\frac{66}{3\times 10^8}\right)\cos 2\pi \times 10^{11}\left(t - \frac{x}{c}\right)$

$= 22 \times 10^{-8}\cos 2\pi \times 10^{11}\left(t - \frac{x}{c}\right)$

$= 2.2 \times 10^{-7}\cos 2\pi \times 10^{11}\left(t - \frac{x}{c}\right)$

43. Ans (1)



$B_1 = 0,\ B_2 = \frac{\mu_0 I}{4\pi x},\ B_3 = \frac{\mu_0 I \sin 45^o}{4\pi x}$

Here $\sin 45° = \frac{x}{R}$

$B_P = B_2 - B_3$

$\therefore\ x = R/\sqrt{2}$

$= \frac{\mu_0 I}{4\pi x}\left(1 - \frac{1}{\sqrt{2}}\right) = \frac{\mu_0 I}{4\pi\frac{R}{\sqrt{2}}}\left(\frac{\sqrt{2}-1}{\sqrt{2}}\right)$

$= \frac{\mu_0 I}{4\pi R}\left(\sqrt{2}-1\right)$

44. Ans (4)

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

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

45. Ans (4)

$\tau = MB\sin\theta$] $\theta = 0°$ → Stable equilibrium

$U = -MB\cos\theta$] $\theta = 180°$ → Unstable equilibrium

46. Ans (1)

$r_1 : r_2 = 1 : 2$ and $B_1 : B_2 = 1 : 3$. We know that

$B = \frac{\mu_0}{4\pi}\cdot\frac{2\pi ni}{r} \Rightarrow \frac{i_1}{i_2} = \frac{B_1 r_1}{B_2 r_2} = \frac{1\times 1}{3\times 2} = \frac{1}{6}$

47. Ans (3)

$R = \frac{mv}{qB} = \frac{2\times 10^{-6}\times 3}{6\times 10^{-6}\times 1} = 1\ m < d = 1.2\ m$

48. Ans (4)

(a) $\xrightarrow{u}$ E||B||u $\rightarrow u_1$

$F_m = 0\ (\vec{u}||\vec{B})$

$Fe \neq 0$

$u_1 > u$

but path : straight line

(b) If $\vec{E} = -(\vec{u} \times \vec{B})$ then undeflected

Here $\vec{E}||\vec{B}$

49. Ans (2)

$$V_{rms}\sqrt{\frac{\int_0^{T/2} V_0^2 dt + \int_{T/2}^{T} 0 dt}{T}} = \sqrt{\frac{4V_0^2 \frac{T}{2}}{T}} = V_0\sqrt{2}$$

50. Ans (1)

$$\omega_r = \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{8 \times 10^{-3} \times 20 \times 10^{-6}}}$$

$= 2500$ rad/s

$$i = \frac{V}{R} = \frac{220}{44}A = 5A$$

peak value $= \sqrt{2}\ i_{rms} = 5\sqrt{2}\,A$

SUBJECT : BOTANY

SECTION-A

51. Ans (3)

NCERT Pg. # 78

52. Ans (3)

NCERT Page No. # 83, 87 (E), 76, 79 (H)

53. Ans (2)

XII NCERT Page No. # 86, 87

54. Ans (2)

Module No. 9 Page. No.4

55. Ans (3)

NCERT XII, Pg. # 82

56. Ans (3)

NCERT XII Pg. No. # 61

57. Ans (4)

NCERT XII Page-No. 74

58. Ans (1)

NCERT Pg. No. # 61

60. Ans (2)

NCERT XII Pg#71 FIG. 5.2

61. Ans (1)

XII NCERT Pg # 85, 86, 87

62. Ans (4)

Module No. 8 Page. No.113

63. Ans (4)

Module No. 9 Page. No.116

64. Ans (4)

Module No. 9 Page. No.99

65. Ans (3)

NCERT-XII, Pg.#96

66. Ans (4)

Module, Pg. # 70

67. Ans (4)

NCERT XII Pg#107

68. Ans (2)

NCERT XII Pg#111(E), 122(H)

69. Ans (1)

NCERT XII Pg#107(E), 118(H)

70. Ans (4)

NCERT XII Pg#115(E), 126(H)

71. Ans (1)

NCERT, Pg. # 104

72. Ans (1)

XII NCERT Pg # 100, 103

73. Ans (4)

NCERT-XII, Page No. # 107, 108, 111, 114

74. Ans (3)

NCERT XII Pg#87

75. Ans (3)

NCERT, Pg. # 97

76. Ans (1)

NCERT Pg. No. # 61

77. Ans (1)

XII NCERT Pg # 188, 187

78. Ans (3)
NCERT-XII, Pg. # 187, 188

79. Ans (4)
NCERT XII, Pg. # 181

80. Ans (2)
NCERT XII, Pg. # 187

81. Ans (2)
XII NCERT Pg # 187

82. Ans (1)
XII NCERT Pg # 187, 188

83. Ans (3)
NCERT XII Page No. 187,186

84. Ans (1)
XII NCERT Pg # 187

85. Ans (1)
XII NCERT Pg # 188

SECTION-B

86. Ans (4)
NCERT Pg. # 80

87. Ans (1)
XII NCERT Page No. # 86

88. Ans (1)
NCERT-XII, Pg. No. # 77

89. Ans (1)
NCERT XII Pg # 89

90. Ans (3)
NCERT XII Page-No.78

91. Ans (3)
NCERT, Pg. # 114, Para # 6.7

92. Ans (1)
NCERT XII Page-No. 101

93. Ans (4)
NCERT XII Pg#83,87(E), 92,97(H)

94. Ans (1)
NCERT XII Pg#84

95. Ans (3)
NCERT, Pg. # 104

96. Ans (2)
NCERT XII Pg#90

97. Ans (4)
NCERT, Pg. # 89, Para # 5.8.2

98. Ans (4)
NCERT XII, Pg. # 185

99. Ans (4)
NCERT Pg. No. # 187

100. Ans (2)
NCERT XII, Pg. # 181

SUBJECT : ZOOLOGY

SECTION-A

101. Ans (2)
NCERT Pg # 195,198,199

102. Ans (3)
NCERT XII, Pg. # 195, 196 (E)
215 (H)

103. Ans (2)
NCERT Pg # 199

104. Ans (1)
NCERT Pg # 209, 211, 212

105. Ans (4)
NCERT Pg # 158

106. Ans (3)
NCERT-XII, Pg. # 194, 195

107. Ans (1)
NCERT Pg#198

108. Ans (2)
NCERT XII, Pg. No. 203,194,195

109. Ans (1)
NCERT XII, Pg. No. 197,202,203

110. Ans (1)
NCERT XII, Pg. No. 202,197,195

111. **Ans (1)**
NCERT XII, Pg. No. 197

112. **Ans (3)**
NCERT XII, Pg. No. 198

113. **Ans (2)**
NCERT XII, Pg. No. 194

114. **Ans (2)**
NCERT XII, Pg. No. 199

115. **Ans (1)**
NCERT XII, Pg. No. 198

116. **Ans (4)**
NCERT XII, Pg. No. 197

117. **Ans (4)**
NCERT XII, Pg. No. 199

118. **Ans (1)**
NCERT XII, Pg. No. 200,207

119. **Ans (4)**
NCERT XII, Pg. No. 197

120. **Ans (2)**
NCERT XII, Pg. No. 197

121. **Ans (2)**
NCERT XII, Pg. No. 194

122. **Ans (1)**
NCERT Pg # 208

123. **Ans (2)**
NCERT Pg # 208

124. **Ans (2)**
NCERT-XII, Pg. # 210

125. **Ans (3)**
NCERT, Pg. # 201

126. **Ans (2)**
NCERT Pg # 209

127. **Ans (1)**
NCERT Pg. # 209

128. **Ans (1)**
NCERT Page No. # 198 / 217

129. **Ans (2)**
NCERT-XII, Pg. # 176, 177

130. **Ans (1)**
NCERT XII Pg # 194

132. **Ans (4)**
NCERT XII, Pg. No. 211

133. **Ans (3)**
NCERT XII, Pg. No. 211

134. **Ans (1)**
NCERT XII, Pg. No. 211

135. **Ans (3)**
NCERT XII, Pg. No. 209

SECTION-B

138. **Ans (1)**
NCERT 12th Pg. No. 203

139. **Ans (2)**
NCERT (XIIth) Pg. # 208

140. **Ans (1)**
NCERT Pg. # 210

141. **Ans (2)**
NCERT XII, Pg. No. 196

142. **Ans (3)**
NCERT XII, Pg. No. 208

143. **Ans (3)**
NCERT XII, Pg. No. 196

145. **Ans (3)**
NCERT Page 195

146. **Ans (4)**
NCERT Pg # 196

147. **Ans (1)**
NCERT PG: 209, 12.1, Para-3

148. **Ans (2)**
NCERT Pg # 211

149. **Ans (2)**
NCERT Pg # 213

150. **Ans (1)**
NCERT,Pg.# 209

SUBJECT : CHEMISTRY

SECTION-A

152. Ans (2)

$K_f \uparrow\uparrow$ Stability $\uparrow\uparrow$

159. Ans (1)

NCERT-XII (2019), Pg. # 248

165. Ans (2)

$PCl_3 + 3H_2O \longrightarrow H_3PO_3 + 3HCl$

169. Ans (3)

graphite is thermodynamically most stable allotrope of carbon.

172. Ans (4)

$2NO_2 + H_2O \longrightarrow HNO_3 + HNO_2$

$H_2S + (CH_3COO)_2Pb \longrightarrow PbS$ (Black)

176. Ans (2)

Lanthavoid + Fe + some traces of S.C. etc.

177. Ans (4)

NCERT Pg.#229

178. Ans (4)

Only Gd^{+3} ($[Xe]4f^7$) is paramagnetic because it as 7 unpaired electrons.

183. Ans (4)

NH_3 gas brown colour solution with Nesseler reagent

SECTION-B

186. Ans (1)

As per trans effect.

190. Ans (2)

$3Mg + N_2 \xrightarrow{\Delta} Mg_3N_2$

$Mg_3N_2 + 6H_2O \longrightarrow 3Mg(OH)_2 + 2NH_3$

$CuSO_4 + 4NH_3 \longrightarrow [Cu(NH_3)_4]SO_4$

192. Ans (1)

$NH_4NO_3 \xrightarrow{\Delta} N_2O + 2H_2O$

198. Ans (2)

Lanthanoides(Ln) + acids $\longrightarrow H_2 + H_2O \longrightarrow Ln(OH)_3 + H_2$

199. Ans (3)

$BiCl_3 + H_2O \rightarrow \underset{\text{White Turbidity}}{BiOCl} + 2HCl$

Shows particle Hydrolysis.