CLASSROOM CONTACT PROGRAMME
(Academic Session : 2024 - 2025)

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 : 08-12-2024

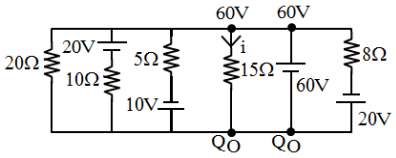
ANSWER KEY

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.	4	3	1	3	4	1	4	2	2	1	3	4	4	2	2	3	2	2	1	3	1	3	1	2	2	4	1	1	3	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.	2	3	2	2	1	2	2	1	3	2	1	2	1	4	3	4	4	1	1	2	3	4	1	1	4	3	2	4	2	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.	2	4	3	3	1	4	4	2	2	2	3	3	4	4	4	3	3	1	1	4	3	3	1	2	3	1	2	2	3	1
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.	2	2	1	4	3	1	2	2	4	3	2	4	2	1	4	2	1	2	2	4	1	4	1	4	3	4	2	4	4	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.	2	3	3	2	4	1	2	1	4	4	1	2	2	4	3	2	4	2	3	1	3	3	1	3	2	4	2	1	1	2
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.	2	1	3	4	4	2	1	3	2	4	3	4	1	4	4	4	4	3	1	1	4	3	3	2	1	1	2	4	3	1

HINT – SHEET

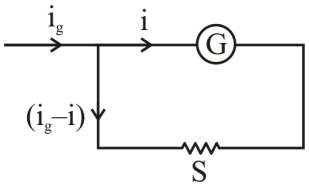
1. Ans (4)

Relative potential Method.



$$i = \frac{60-0}{15} = 4\text{Amp (From P to Q)}$$

2. Ans (3)



$$i = i_g \times \frac{30}{100}$$

$$iG = (i_g - i)S$$

$$i_g \frac{3}{10} \times 10 = \left(i_g - i_g \times \frac{3}{10}\right) s$$

$$3i_g = i_g \left(\frac{7}{10}\right) s$$

$$\Rightarrow \quad 30 = 7S$$

$$S = \frac{30}{7}\Omega$$

3. Ans (1)

$$I_S = \frac{nBA}{C} = 5 \text{ div/mA}$$

$$V_S = \frac{nBA}{CR} = 20 \text{ div/v}$$

Where C = releasing torque

$$\text{So, } V_S = \frac{I_S}{R}$$

$$20 = \frac{\left(\frac{5}{10^{-3}}\right)}{R}$$

$$R = \frac{5}{20 \times 10^{-3}}$$

$$R = 250\ \Omega$$

4. Ans (3)

$$P_{max} \Rightarrow r = R$$

$$i = \frac{E_{eq}}{r_{eq} + R} = \frac{E_{eq}}{2r_{eq}}$$

$$= \frac{(1 + 2 + 3.....)}{2(1 + 2 + 3.....)} = \frac{1}{2}A$$

5. Ans (4)

When supplied voltage is equal to rated voltage then in series combination, power is given by

$$\frac{1}{P_S} = \frac{1}{P_1} + \frac{1}{P_2}$$

$$\frac{1}{P_S} = \frac{P_1 \times P_2}{P_1 + P_2} = \frac{200 \times 100}{200 + 100} = \frac{200}{3} = 66.67W$$

6. Ans (1)

$V = \varepsilon - Ir$

$50 = \varepsilon - Ir = \varepsilon - 11r$ ...(1)

$60 = \varepsilon - Ir = \varepsilon - 1r$ ...(2)

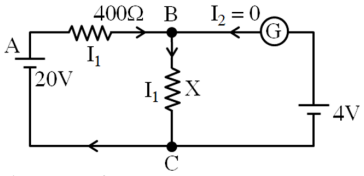
On solving (1) & (2)

$(60 - 50) = (-1 + 11)r$

$10 = 10r$

$\therefore$ $r = 1\ \Omega$

7. Ans (4)



As $I_2 = 0$

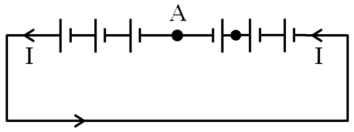
So, $V_{BC} = 4V$ and 400Ω becomes in series with X

$V_{AB} = 20 - 4 = 16$ V

$I_1 = \frac{16}{400} = 40mA$

Across X : $X = \frac{4}{40m} = 100\,\Omega$

8. Ans (2)



Total emf. = 6E − 2E = 4E

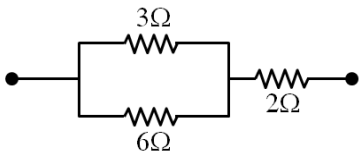
Total resistance = 6r

$I = \frac{4E}{6r}$

$\therefore$ $V_A = E + Ir$

$= E + \frac{4E}{6r} \times r = \frac{5E}{3}$

9. Ans (2)



10. Ans (1)

Theory based

11. Ans (3)

$I = \vec{J}.\vec{A} = (2\hat{i} + 3\hat{j} + 4\hat{k}).(\hat{i} + \hat{j} + \hat{k})$

$= 2 + 3 + 4$

$I = 9A$

12. Ans (4)

$J = \frac{I}{A} = \frac{V}{RA} = \frac{V}{A} \times \frac{\sigma A}{\ell}$

$J = \frac{V\sigma}{\ell}$

$= \frac{50 \times 60 \times 10^6}{150}$

$J = 20 \times 10^6\ A/m^2$

13. Ans (4)

Figure of merit $K = \frac{E}{(R+G)}\frac{1}{\theta}$

$K_1 = \frac{2}{(5080)} . \frac{1}{10} = 3.9 \times 10^{-5}$

$K_2 = \frac{4}{(10080)} . \frac{1}{10} = 3.9 \times 10^{-5}$

$K = \frac{K_1 + K_2}{2} = 3.9 \times 10^{-5} \Rightarrow K \approx 4 \times 10^{-5}$

14. Ans (2)

$\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \ldots\ldots \frac{1}{R_n} = \frac{1}{x}$ .... (1)

$\frac{1}{R_2} + \frac{1}{R_3} + \ldots\ldots \frac{1}{R_n} = \frac{1}{y}$ .... (2)

$\frac{1}{R_1} + \frac{1}{y} = \frac{1}{x}$

$\frac{1}{R_1} = \frac{(y-x)}{xy}$

$\left(R_1 = \frac{(xy)}{y-x}\right)$

15. Ans (2)

$R_{t_1} = R_0(1 + \alpha t_1)$

$R_{t_2} = R_0(1 + \alpha t_2)$

Dividing $\frac{R_{t_1}}{R_{t_2}} = \frac{1 + \alpha t_1}{1 + \alpha t_2}$

$\frac{100}{200} = \frac{1 + 100\alpha}{1 + \alpha t}$

Solving $t = 300°C$

16. Ans (3)

For A : $L = \ell$; $A = \ell t$

$R_A = \frac{\rho\ell}{\ell t} = \frac{\rho}{t}$ .....(I)

For B : $L = 2\ell$; $A = 2\ell t$

$R_B = \frac{\rho(2\ell)}{(2\ell t)} = \frac{\rho}{t}$ ....(II)

$\therefore$ $\frac{R_A}{R_B} = \frac{1}{1}$

17. Ans (2)

$L_i = \ell$; $L_f = \ell + \frac{40\ell}{100} = 1.4\ell$ .....(I)

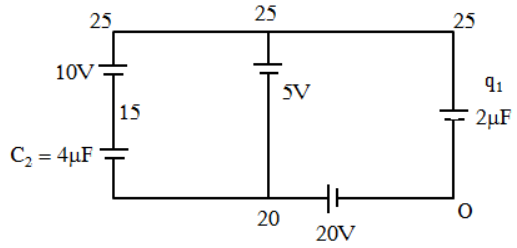
Volume remains constant

$A_f = \frac{\ell A}{1.4\ell} = \frac{A}{1.4}$ .....(II)

$$\frac{R_f - R_i}{R_i} \times 100 = \frac{\frac{\rho(1.4\ell)}{(A/1.4)} - \frac{\rho\ell}{A}}{\frac{\rho\ell}{A}} \times 100$$

$= [(1.4)^2 - 1] \times 100 = 96\%$

18. Ans (2)

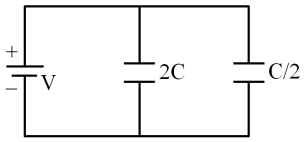


$q_1 = 2 \times 25 = 50\ \mu C$

Potential of $4\mu F = 5V$

$U = \frac{1}{2}4 \times 25 = 50\mu J$

19. Ans (1)

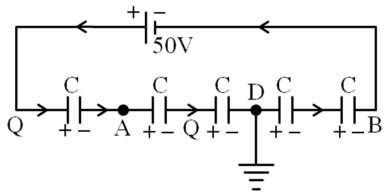


W.D by battery

$= C_1V_1^2 + C_2V_2^2$

$= (2C)V^2 + \left(\frac{C}{2}\right)V^2 = \frac{5}{2}CV^2$

20. Ans (3)



$C_{eq} = \frac{C}{5}$; $Q = \frac{C}{5} \times 50 = 10C$; $V_D = 0$

Apply K.V.L from D to A

$V_D + \frac{Q}{C} + \frac{Q}{C} = V_A$

$V_A = \frac{2Q}{C} = \frac{2(10C)}{C}$

$V_A = 20\ V$

Apply K.V.L from D to B

$V_D - \frac{Q}{C} - \frac{Q}{C} = V_B$

$V_B = -20V$

22. Ans (3)

$E = \frac{dv}{dx}$ slope of $v - x = \tan\theta$

$E_1 \propto \tan\theta_1 \Rightarrow \frac{Q}{A\varepsilon_0 K_1} \propto \tan\theta_1$

$E_2 \propto \tan\theta_2 \Rightarrow \frac{Q}{A\varepsilon K_2} \propto \tan\theta_2$

$\frac{K_2}{K_1} = \frac{\tan\theta_1}{\tan\theta_2} \Rightarrow \frac{K_2}{K_1} = \frac{\cot\theta_2}{\cot\theta_1}$

23. Ans (1)

Q = const. (Battery removed) ;

$C \longrightarrow$ decreases ; $\uparrow U = \frac{Q^2}{2C\downarrow}$

$E = \frac{Q}{A\varepsilon_0\varepsilon_r}$; $E' = \frac{Q}{A\varepsilon_0}$

E = field increases.

24. Ans (2)

$\therefore$ 55 is 25% of 220

Clearly t_0 will Be more than τ.

Because at τ time current reaches to 37% of maximum value.

25. Ans (2)

Capacitor $\longrightarrow$ open ; $I = \frac{2}{4+1+5} = 0.2\ A$

Apply KVL to find Potential difference

26. Ans (4)

$C = \frac{\varepsilon_0 A}{\left(d - t + \frac{t}{K}\right)}$

Where $t = \frac{3d}{4}$

27. Ans (1)

From the given graphs, find the voltages, V_A and V_B, on capacitor A and B corresponding to charge Q on each of the capacitors. Clearly,

$V_A = \frac{Q}{C_A}$ and $V_B = \frac{Q}{C_B}$ or

$\frac{V_B}{V_A} = \frac{Q/C_B}{Q/C_A} = \frac{C_A}{C_B}$

Since, $V_B > V_A$, $C_A > C_B$ i.e., the capacitor A has the higher capacitance.

28. Ans (1)

$$C = \frac{\varepsilon_0 A}{d} = \frac{8.854 \times 10^{-12} \times 6 \times 10^{-3}}{3 \times 10^{-3}}$$

$C = 1.77 \times 10^{-11}$ F

When the capacitor is connected to a 100 V supply, charge on each plate of the capacitor

$q = CV = 1.77 \times 10^{-11} \times 100$

$q = 1.77 \times 10^{-9}$ C

29. Ans (3)

Given, capacitance of capacitor $C_1 = 600$ pF $= 600 \times 10^{-12}$ F and supply voltage $V_1 = 200$ V

$C_2 = 600$ pF $= 600 \times 10^{-12}$ F and $V_2 = 0$

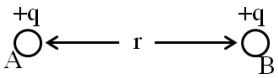
$$\text{Loss in energy (E)} = \frac{C_1C_2(V_1 - V_2)^2}{2(C_1 + C_2)}$$

$$\Rightarrow E = \frac{600 \times 10^{-12} \times 600 \times 10^{-12}(200 - 0)^2}{2(600 + 600) \times 10^{-12}}$$

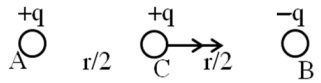
$= 6 \times 10^{-6}$ J

Thus, the 6×10^{-6} J amount of electrostatic energy is lost in the sharing of charges.

30. Ans (3)



$$F = \frac{Kq^2}{r^2} \quad \text{.....(1)}$$

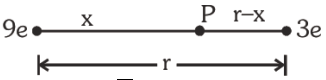
New 

$$F_C = \frac{Kq^2}{(r/2)^2} + \frac{Kq^2}{(r/2)^2} = \frac{8Kq^2}{r^2} \quad \text{.....(II)}$$

∴ From (I) and (II)

$F_C = 8F$ N towards $-q$

31. Ans (2)

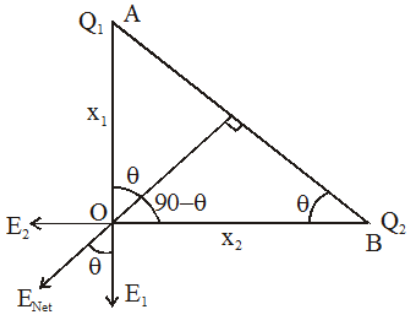


$$x = \frac{\sqrt{9}}{\sqrt{9} + \sqrt{3}} r = \frac{3r}{3 + \sqrt{3}}$$

$$x = \frac{r}{1 + \frac{\sqrt{3}}{3}} = \frac{r}{1 + \frac{1}{\sqrt{3}}}$$

From 9e charge

32. Ans (3)



E_2 = electric field due to Q_2

$$= \frac{kQ_2}{x_2^2}$$

$$E_1 = \frac{kQ_1}{x_1^2}$$

From diagram

$$\tan\theta = \frac{E_2}{E_1} = \frac{x_1}{x_2}$$

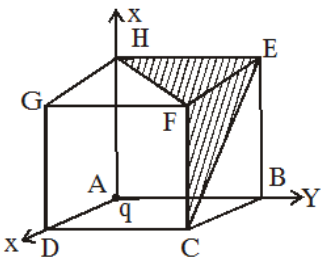
$$\frac{kQ_2}{x_2^2 \times \frac{kQ_1}{x_1^2}} = \frac{x_1}{x_2}$$

$$\frac{Q_2x_1^2}{Q_1x_2^2} = \frac{x_1}{x_2}$$

$$\frac{Q_2}{Q_1} = \frac{x_2}{x_1}$$

$$\frac{Q_1}{Q_2} = \frac{x_1}{x_2}$$

33. Ans (2)



flux through cube $= \frac{q}{8\epsilon_0}$

flux through surfaces ABEH, ADGH, ABCD will be zero

$$\phi(EFGH) = \phi(DCFG) = \phi(EBCF) = \left(\frac{q}{24\epsilon_0}\right)$$

34. Ans (2)

$qE = Mg$

$$neE = \rho\left(\frac{4}{3}\pi r^3\right) \times g$$

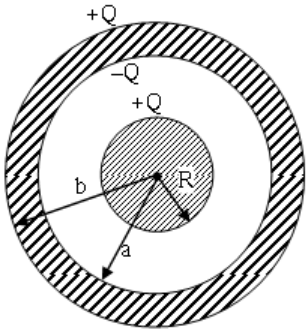
$n \times 1.6 \times 10^{-19} \times 3.55 \times 10^5$

$= 3 \times 10^3 \times \frac{4}{3} \times \pi \times (2 \times 10^{-3})^3 \times 9.81$

$n = 173 \times 10^{(3 - 9 - 5 + 19)}$

$n = 1.73 \times 10^{10}$

35. Ans (1)

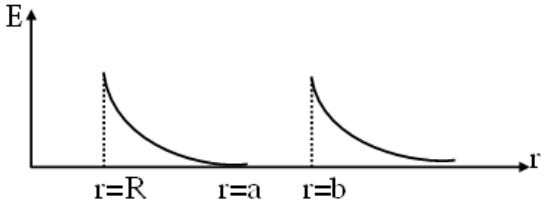


$r < R$, $E = 0$

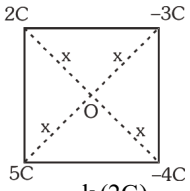
$R \leqslant r < a$ $\quad E = \dfrac{kQ}{r^2}$

$a \leqslant r < b$, $\quad E = 0$

$r \geqslant b$ $\quad E = \dfrac{kQ}{r^2}$



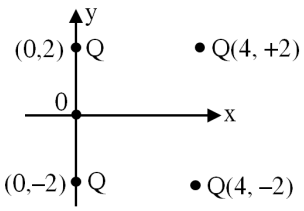
36. Ans (2)



$$V_O = \frac{k(2C)}{x} + \frac{k(-3C)}{x} + \frac{k(-4C)}{x} + \frac{k(5C)}{x}$$

$V_O = 0$, $E_O \neq 0$

37. Ans (2)



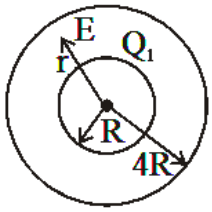
$$\text{Potential at origin} = \frac{KQ}{2} + \frac{KQ}{2} + \frac{KQ}{\sqrt{20}} + \frac{KQ}{\sqrt{20}}$$

(Potential at $\infty = 0$)

$$= KQ\left(1 + \frac{1}{\sqrt{5}}\right)$$

∴ Work required to put a fifth charge Q at origin is equal to $\dfrac{Q^2}{4\pi\varepsilon_0}\left(1 + \dfrac{1}{\sqrt{5}}\right)$

38. Ans (1)



$$E = \frac{KQ_1}{r^2}$$

$$\Delta V = \int_R^{4R} E\, dr = \frac{3KQ_1}{4R}$$

39. Ans (3)

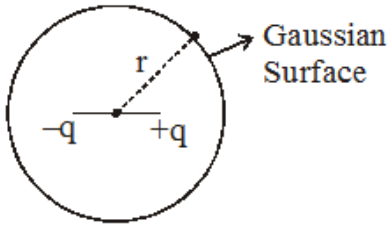
Potential of $-q$ is same as initial and final point of the path therefore potential due to 4q will only change and as potential is decreasing the energy will decrease

Decrease in potential energy $= q(V_i - V_f)$

Decrease in potential energy

$$= q\left[\frac{k4q}{d/2} - \frac{k4q}{3d/2}\right] = \frac{4q^2}{3\pi\varepsilon_0 d}$$

40. Ans (2)

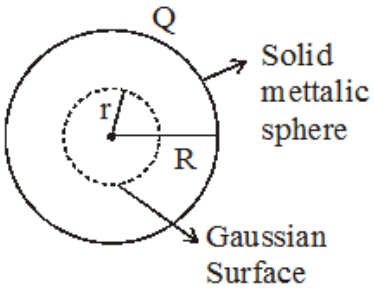


$$\oint \vec{E}.\vec{ds} = \frac{q_{in}}{\varepsilon_0} = 0 = \phi$$

Flux of $\vec{E}$ through sphere is zero

But $\oint \vec{E}.\vec{ds} = 0 \Rightarrow \{\vec{E}.\vec{ds} \neq 0\}$ for small section ds only

Statement-2



As change encloses within gaussian surface is equal to zero.

$$\phi = \oint \vec{E}.\vec{ds} = 0$$

Option(2) statement-1 correct statement-2 false.

41. Ans (1)

As outer sphere is earthed, the charge on its outer surface is zero.

So, the E.F. out side it will be zero

42. Ans (2)

When a positively charged body connected to earth, electrons flows from earth to body and body becomes neutral.

43. Ans (1)

New charges will be $-2\mu C$ and $+3\mu C$.

In first case; $40 = \frac{1}{4\pi\varepsilon_0} \times \frac{3 \times 8}{r^2}$

In second case ; $F = \frac{1}{4\pi\varepsilon_0} \times \frac{(-2 \times 3)}{r^2}$

$\therefore \frac{F}{40} = \frac{-2 \times 3}{3 \times 8}$

or $F = -10$ N

44. Ans (4)

Theory based

45. Ans (3)

Electric field is due to all charges that are present inside and outside the Gaussian surface

49. Ans (1)

$25°C \rightarrow 35°C \rightarrow 45°C \rightarrow 55°C \rightarrow 65°C \rightarrow 75°C$

$2 \times 2 \times 2 \times 2 \times 2 = 2^5 = 32$ times

50. Ans (2)

$k = Ae^{-E_a/RT}$

$\ln k = \ell nA - E_a/RT$

For ln k vs 1/T

ln A = intercept

$-E_a/R$ = Slope $= -2 \times 10^4$ K

$E_a = R \times 2 \times 10^4$ K $= 8.3 \times 2 \times 10^4$ J mol^{-1}

$= 16.6 \times 10^4$ J mol^{-1} or 166 KJ mol^{-1}

51. Ans (3)

$\Delta H = E_a - E_b$

$5 = 15 - E_b$

$E_b = 15 - 5 = 10$ kJ mol^{-1}

52. Ans (4)

$2P + Q \longrightarrow R$

differential rate equation

$-\frac{1}{2}\frac{d[P]}{dt} = -\frac{d[Q]}{dt} = \frac{d[R]}{dt} = R[P]^2[Q]$

62. Ans (4)

Copper is less reactive than Fe

68. Ans (2)

Theory Based

70. Ans (2)

$S = \sqrt{k_{sp}} = \sqrt{1 \times 10^{-10}}$

$S = 10^{-5}$

$\Lambda_m^o = \frac{\kappa \times 1000}{S}$

$144 = \frac{\kappa \times 1000}{10^{-5}}$

74. Ans (4)

$CuSO_4(s) \xrightarrow{-65.5} CuSO_4(aq)$

$\Delta H \downarrow \quad \uparrow -11.7$

$CuSO_4.5H_2O(s)$

$-65.5 = \Delta H + (-11.7)$

$\Delta H = -53.8$ kJ/mol

76. Ans (3)

Eq. $KMnO_4$ = Eq. C_2O_4

$.025 \times 5 \times 20 = 0.1 \times 2 \times V$

V = 12.5 ml

77. Ans (3)

pH range for titration is 6 to 11.

78. Ans (1)

$\overset{-}{2I_{(aq)}} + \overset{-1}{H_2O_{2(\ell)}} + 2H^+_{aq} \rightarrow \overset{0}{I_{2(s)}} + \overset{-2}{2H_2O_{(\ell)}}$

83. Ans (1)

$\frac{Y_A}{Y_B} = \frac{P_A^o X_A}{P_B^o X_B}$

$\frac{4}{5} = \frac{1}{5}\frac{X_A}{X_B} \Rightarrow \frac{X_A}{X_B} = 4$

$\Rightarrow X_B = \frac{1}{5}$

91. Ans (2)

NCERT-XI Pg. No. # 65

92. Ans (2)

NCERT-XI Pg. No. # 67

93. Ans (1)

NCERT-XI Pg. No. # 61

94. **Ans (4)**
NCERT-XI Pg. No. # 65

95. **Ans (3)**
NCERT-XI Pg. No. # 64

96. **Ans (1)**
NCERT-XI Pg. No. # 62

97. **Ans (2)**
NCERT-XI Pg. No. # 64

98. **Ans (2)**
NCERT-XI, Pg. # 61

99. **Ans (4)**
NCERT-XI Pg. No. # 64

100. **Ans (3)**
NCERT-XI Pg. No. # 58

101. **Ans (2)**
NCERT-XI Pg. No. # 74

102. **Ans (4)**
NCERT-XI Pg. No. # 72

103. **Ans (2)**
NCERT-XI Pg. No. # 74

104. **Ans (1)**
NCERT-XI Pg. No. # 71

105. **Ans (4)**
NCERT-XI Pg. No. # 72

106. **Ans (2)**
NCERT-XI Pg. No. # 74,76

107. **Ans (1)**
NCERT-XI Pg. No. # 76

108. **Ans (2)**
NCERT-XI Pg. No. # 73-74

109. **Ans (2)**
NCERT-XI Pg. # 76-77

110. **Ans (4)**
NCERT-XI Pg. # 74

111. **Ans (1)**
NCERT-XII Pg. # 6

112. **Ans (4)**
NCERT-XII Pg. # 14

113. **Ans (1)**
NCERT-XII Pg. # 10

114. **Ans (4)**
NCERT-XII Pg. # 11

115. **Ans (3)**
NCERT-XII Pg. # 10,11

116. **Ans (4)**
NCERT-XII Pg. # 13

117. **Ans (2)**
NCERT-XII Pg. # 7

118. **Ans (4)**
NCERT-XII Pg. # 7

119. **Ans (4)**
NCERT-XII Pg. # 12

120. **Ans (1)**
NCERT-XII Pg. # 15

121. **Ans (2)**
NCERT-XII Pg. # 9

122. **Ans (3)**
NCERT-XII Pg. # 18, 19

123. **Ans (3)**
NCERT-XI Pg. No. # 69

124. **Ans (2)**
NCERT-XI Pg. No. # 62

125. **Ans (4)**
NCERT-XI Pg. No. # 63

126. **Ans (1)**
NCERT-XI Pg. No. # 65

127. **Ans (2)**
NCERT-XI Pg. 72

128. **Ans (1)**
NCERT-XI Pg # 75,76,74

129. **Ans (4)**
NCERT-XI (old) Pg. # 85

130. Ans (4)
NCERT-XI Pg. 76-77

131. Ans (1)
NCERT XII Pg. No. 20

132. Ans (2)
NCERT-XII, Pg # 9-11

133. Ans (2)
NCERT-XII Pg.# 20, 11, 13

134. Ans (4)
NCERT XII_Pg. No. 18

135. Ans (3)
NCERT XII_Pg. No. 20

136. Ans (2)
NCERT-XII, Pg. # 27,28,29,31

137. Ans (4)
NCERT-XII, Pg. # 27, 28, 29, 30

139. Ans (3)
NCERT-XII, Pg. # 34, 35

140. Ans (1)
NCERT-XII, Pg. No. # 32

141. Ans (3)
NCERT-XII, Pg. # 31

142. Ans (3)
NCERT-XII, Pg. # 31

143. Ans (1)
NCERT-XII, Pg. # 30

144. Ans (3)
NCERT-XII, Pg. # 37 (E)

145. Ans (2)
NCERT-XII, Pg. # 36

146. Ans (4)
NCERT-XII, Pg. # 31, 32, 35

148. Ans (1)
NCERT-XII, Pg. # 27

149. Ans (1)
NCERT-XII, Pg. # 27

151. Ans (2)
NCERT-XII, Pg # 31

152. Ans (1)
NCERT-XII, Pg # 30

153. Ans (3)
NCERT-XII, Pg. # 27

154. Ans (4)
NCERT-XII, Pg. # 32

169. Ans (1)
NCERT-XII, Pg. # 46

170. Ans (1)
NCERT-XII, Pg. # 48

171. Ans (4)
NCERT-XII, Pg. # 48

172. Ans (3)
NCERT-XII, Pg. # 48

173. Ans (3)
NCERT-XII, Pg. # 44

174. Ans (2)
NCERT-XII, Pg. # 44

175. Ans (1)
NCERT-XII, Pg. # 46

176. Ans (1)
NCERT-XII, Pg. # 44, 45

177. Ans (2)
NCERT-XII, Pg. # 49

178. Ans (4)
NCERT-XII, Pg. # 46

179. Ans (3)
NCERT-XII, Pg. # 45, 46, 48

180. Ans (1)
NCERT-XII, Pg. # 45