SAMPLE PAPER # 02

TARGET : PRE-MEDICAL 2022

Test Type : **SAMPLE PAPER** Test Pattern : **NEET (UG)**

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

HINT – SHEET

SUBJECT : PHYSICS

SECTION - A

1. Ans (2)

If the number less than 1, the zero (s) on the right of decimal point and before the first non-zero digit are not significant.

2. Ans (2)

For vertically upward motion, $h_1 = v_0 t - \frac{1}{2}gt^2$

and for vertically down ward motion,

$h_2 = v_0 t + \frac{1}{2}gt^2$

$\therefore$ Total distance covered in t sec $h = h_1 + h_2 = 2v_0 t$

3. Ans (2)

All the objects outside train will appear to move with same velocity.

4. Ans (1)

$F_{avg.} = \frac{\Delta p}{\Delta t} = \frac{m[v_f - v_i]}{\Delta t} = \frac{1 \times [0 - 6]}{0.1}$

$= -60N$

5. Ans (2)

Here,

$m = 1000$ kg, $v = 18$ km $h^{-1} = 18 \times \frac{5}{18}$ ms^{-1}

$= 5$ ms^{-1}

$k = 6.25 \times 10^3$ N m^{-1}

At maximum compression x_m, the kinetic energy of the car is converted entirely into the potential energy of the spring.

$\therefore \frac{1}{2}mv^2 = \frac{1}{2}kx_m^2$ or $x_m = \sqrt{\frac{m}{k}}v$

Substituting the given values, we get

$x_m = \sqrt{\frac{1000 \text{ kg}}{6.25 \times 10^3 \text{ Nm}^{-1}}} \times 5 \text{ m s}^{-1}$

$\Rightarrow 0.4 \times 5 \text{ m} = 2 \text{ m}$

6. Ans (2)

Since there is no displacement along radius vector hence work done is zero by centripetal force, but for tangential force there is displacement, so work done is not zero.

7. Ans (3)

As monkey jumps off ; it have vel 8 m/s in horizontal direction (as it jumps from moving body) so, trolley also then continue to move with same velocity 8 m/s in order to conserved linear momentum.

OR

As there is no external force on trolley in horizontal direction due to jumping off monkey so, it continuous to move with same velocity 8 m/s.

8. Ans (4)

$|\vec{\tau}| = rF \sin\theta$, here $\theta = 0$

9. Ans (2)

Planetary motion is elliptical, angular momentum (mvr or $m\omega r^2$) is conserved.

When r changes ω also changes, V also changes. So total energy remain same but kinetic energy changes.

10. Ans (4)

Streamline criteria is decided by Reynold's number (R_e)

$R_e = \dfrac{\rho v d}{\eta}$ [less is Reynold no., more is the turbulence]

$R_e \propto \dfrac{\rho}{\eta}$ [for low $R_e \Rightarrow \rho$ should be less & η should be high]

Hence option (4)

11. Ans (3)

$$\frac{X-(-125)}{500} = \frac{Y-(-70)}{40}$$

For Y = 50

X = 1375.0°X

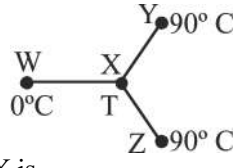
12. Ans (2)

Let T be the temperature at the junction.

Let L and A be the length and area of cross-section of each rod respectively.

∴ Heat current from Y to X is

$$H_1 = \frac{KA(90^\circ C - T)}{L}$$



Heat current from Z to X is

$$H_2 = \frac{KA(90^\circ C - T)}{L}$$

Heat current from X to W is

$$H_3 = \frac{KA(T - 0^\circ C)}{L}$$

At the junction X,

$H_1 + H_2 = H_3$

∴ 90°C – T + 90°C – T = T

Or 3T = 180°C

Or T = 60°C

13. Ans (2)

$PV = nRT$ .....(1)

V = constant

$\Delta PV = nR\,\Delta T$ .....(2)

(2) ÷ (1)

$$\frac{\Delta P}{P} = \frac{\Delta T}{T}$$

$$\frac{0.5}{100} = \frac{2}{T}$$

$\Rightarrow$ T = 400 K OR 127° C

14. Ans (3)

$a = -\omega^2 x$

Phase difference between displacement and acceleration is π.

15. Ans (3)

$\omega^2 = \alpha$, $\omega = \sqrt{\alpha}$

$$T = \frac{2\pi}{\sqrt{\alpha}}$$

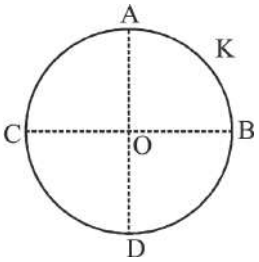
16. Ans (1)

Velocity of wave = $\dfrac{600}{2}$ = 300 m/s

Frequency = 500 Hz, Wavelength $\lambda = \dfrac{3}{5}$ m

Number of wavelength = $\dfrac{600}{3/5}$ = 1000

17. Ans (2)



E the electric field due to AC and BD will be cancel out now electric field due to AKB will be E along OK and and electric field due to CD will be also along OK So net electric field = 2E along OK.

18. Ans (1)

$V_{in} = \frac{k\,q_{in}}{r_{in}} + \frac{k\,q_{out}}{r_{out}}$, $V_{out} = \frac{k\,q_{in}}{r_{out}} + \frac{k\,q_{out}}{r_{out}}$

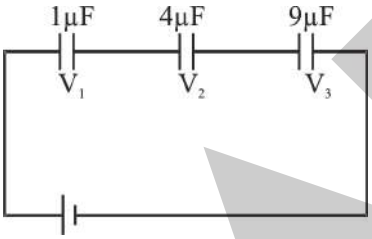
potential difference $V_{in} - V_{out} = \frac{k\,q_{in}}{r_{in}} - \frac{k\,q_{in}}{r_{out}}$

$V_{in} - V_{out}$ does not depend on outer charge

so $V_{in} - V_{out}$ remain unchanged = V

19. Ans (2)

The circuit above can be reduced as drawn in figure below.



In series combination potential is divided in inverse ratio of capacitances so we use the ratio of potential differences across first and second capacitor is

$$\frac{V_2}{V_1} = \frac{1}{4}$$

$$\Rightarrow V_2 = \frac{V_1}{4} = \frac{10}{4} = 2.5V$$

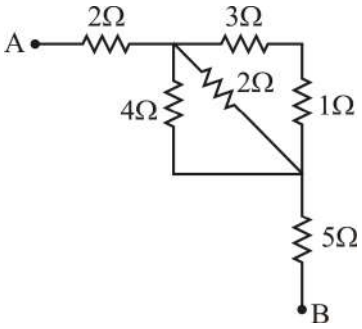
Similarly we use

$$\frac{V_3}{V_1} = \frac{1}{9}$$

$$\Rightarrow V_3 = \frac{V_1}{9} = \frac{10}{9}\,V$$

$$\Rightarrow E = \left(10 + 2.5 + \frac{10}{9}\right) V$$

20. Ans (2)



$R_{AB} = 2 + 1 + 5 = 8\Omega$

21. Ans (3)

When wire is stretched

Volume = constant

$Al = \pi r^2 l$ = constant

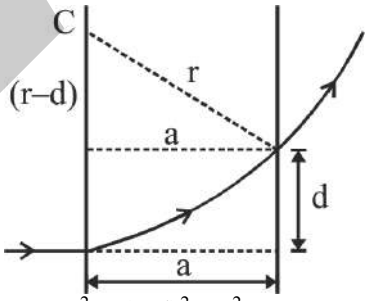
$l \times \frac{1}{r^2}$

Resistance $R = \frac{\rho l}{A}$ so $R \propto \frac{1}{r^4}$

22. Ans (3)

$$B = \frac{\mu_0 I}{2\pi\left(R + \frac{R}{4}\right)} = \frac{2\mu_0 I}{5\pi R}$$

23. Ans (1)



Here $r^2 = (r-d)^2 + a^2$

$r^2 = r^2 + d^2 - 2rd + a^2$

$2rd = a^2 + d^2$

$r = \frac{a^2 + d^2}{2d}$

$\frac{p}{qB} = \frac{a^2 + d^2}{2d}$

$\Rightarrow p = \frac{qB}{2}\left(\frac{a^2}{d} + d\right)$

24. Ans (3)

$e = NBA\omega; \omega = 2\pi f = 2\pi \times \frac{2000}{60}$

$\therefore e = 50 \times 0.05 \times 80 \times 10^{-4} \times 2\pi \times \frac{2000}{60} = \frac{4\pi}{3}$

25. **Ans (2)**

R_2 is in series with L and battery is connected across series combination of L and R_2.

So $\tau = \dfrac{L}{R_2}$

26. **Ans (4)**

In pure inductive circuit current lags behind voltage by $\dfrac{\pi}{2}$.

27. **Ans (1)**

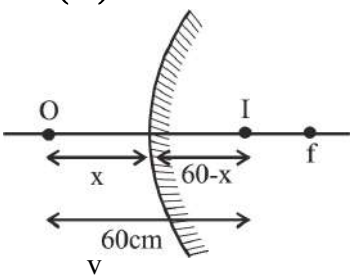
$I = \dfrac{d}{dt}(q_0 \sin \omega t)$

$I = q_0\, \omega \cos \omega t$

$I_{max} = q_0\omega = (10^{-6})\,(2\pi f)$

$= (10^{-6})\,(2\pi \times 10^{-6}) = 6.28$ A

28. **Ans (4)**



$m = -\dfrac{v}{u}$

$\dfrac{1}{4} = -\dfrac{60 - x}{-x} \quad \Rightarrow x = 48$cm

$u = 48$ cm

$v = 12$ cm

$\dfrac{1}{u} + \dfrac{1}{v} = \dfrac{1}{f}$

$\dfrac{1}{-48} + \dfrac{1}{12} = \dfrac{1}{f}$

$f = 16$ cm

29. **Ans (1)**

$\theta = (\mu_v - \mu_R)\, A = (1.68 - 1.56) \times 12° = 1.44°$

31. **Ans (3)**

$\lambda = \dfrac{h}{\sqrt{2mqv}}$

$v \rightarrow$ same

So $\lambda \propto \dfrac{1}{\sqrt{mq}}$

$\dfrac{\lambda_p}{\lambda_\alpha} = \sqrt{\dfrac{m_\alpha q_\alpha}{m_p q_p}}$

$= \sqrt{\dfrac{(4m_p)\,(2e)}{(m_p)\,(e)}}$

$= \dfrac{2\sqrt{2}}{1}$

33. **Ans (3)**

at $t_1 \Rightarrow N_1 = \dfrac{2N_0}{3}$ (as $\dfrac{1}{3}N_0$ disintigrated)

and at $t_2 = N_2 = \dfrac{N_0}{3}$ (as $\dfrac{2}{3}$ N_0 disintigrated)

so in time $(t_1 - t_2)$ half of the N_1

i.e. $\dfrac{N_0}{3}$ disintigrated

hence $t_1 - t_2$ = one half life time = 20 min.

35. **Ans (1)**

$\alpha = 0.96$

$\beta = \dfrac{\alpha}{1-\alpha} = \dfrac{0.96}{1 - 0.96} = 24$

$\Delta I_C = \dfrac{0.8}{800} = 10^{-3}$ A

$\Delta I_B = \dfrac{\Delta I_C}{\beta} = \dfrac{10^{-3}}{24}\text{A} = \dfrac{1}{24}\text{mA}$

SECTION - B

36. **Ans (4)**

$mg\left(\dfrac{\ell}{4}\right) = \dfrac{1}{2} \times \dfrac{m\ell^2}{3} \times \omega^2$

$\sqrt{\dfrac{3g}{2\ell}} = \omega$

37. **Ans (1)**

$\dfrac{GMm}{(D+D)^2} = \dfrac{GMm}{4D^2}$

38. **Ans (4)**

$Y = \dfrac{F/A}{(\Delta\ell/\ell)}$ here $\Delta\ell = \ell$

$F = AY = (0.1 \times 10^{-4}) \times 2 \times 10^{11}$

$= 2 \times 10^6$ N

39. **Ans (1)**

$\Delta U = n\, C_V\, \Delta T \quad \& \quad T = \dfrac{PV}{nR}$

so $\Delta T = T_2 - T_1 = \dfrac{P_2V_2 - P_1V_1}{nR}$

so $\Delta U = \dfrac{nR}{\gamma - 1}\left(\dfrac{P_2V_2 - P_1V_1}{nR}\right) = \dfrac{P_2V_2 - P_1V_1}{\gamma - 1}$

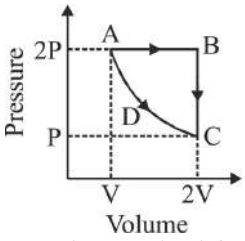
$\Rightarrow \Delta U = \dfrac{-8 \times 10^3}{2/5} = -20$ kJ

40. **Ans (3)**

$\Delta W_{ABC} = 2P(2V - V) = 2PV$

$\Delta W_{ADC} = nRT \ln (2V/V)$

$= 2PV \ln 2$



$\therefore$ The required factor will be

$= \frac{2PV \quad \ln 2}{2PV} = \ln 2$

41. **Ans (3)**

$\ell_{min} = \frac{\lambda}{2}$ and here $\frac{2\pi}{\lambda} = \frac{2\pi}{40}$

$\ell_{min} = 20$ m

42. **Ans (4)**

$E = \frac{2k\lambda}{r}\sin\left(\frac{\alpha}{2}\right)$ For an arc.

Here two arc, $\alpha = 60°$, $\lambda = \frac{Q}{\frac{\pi}{3}r}$

Electric field due to +Q and –Q will be added.
So

$E_0 = 2 \times \frac{2k}{r}\left(\frac{Q}{\frac{\pi}{3}r}\right)\sin\left(\frac{60°}{2}\right)$

$= \frac{6kQ}{\pi r^2}$

43. **Ans (3)**

$R_S = \frac{V}{i_g} - G = \frac{2.5}{10^{-3}} - 10$

$= 2490\ \Omega$

44. **Ans (4)**

$U = -MB\cos\theta$

for stable equilibrium $\theta = 0°$

$U = -MB = -(0.4)(0.16) = -0.064$ J

45. **Ans (4)**

$\frac{1}{2}LI^2 = \frac{1}{2}CV^2$

$I = V\sqrt{\frac{C}{L}}$

$I_{max} = V_{max}\sqrt{\frac{C}{L}}$

$= 20\sqrt{\frac{16 \times 10^{-6}}{40 \times 10^{-3}}}$

$= 0.4$ A

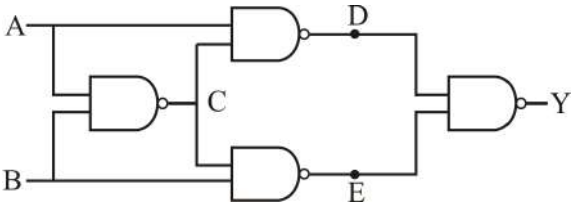
46. **Ans (3)**

$A = \sqrt{A_1 A_2}$

49. **Ans (3)**

$r \propto (A)^{1/3}$

50. **Ans (2)**



Here $C = \overline{AB}$

$D = \overline{A \cdot (\overline{AB})}$

$D = \overline{A \cdot (\bar{A} + \bar{B})} = \overline{A\bar{B}}$

and So $E = \overline{\bar{A}B}$

$D = \bar{A} + B, E = A + \bar{B}$

$y = \overline{DE} = \overline{(\bar{A} + B)(A + \bar{B})} = \overline{AB + \bar{A}\bar{B}}$

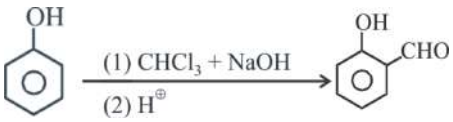
$y = \bar{A}B + A\bar{B}$ XOR gate

So Truth table(2)

SUBJECT : CHEMISTRY

SECTION - A

51. **Ans (1)**

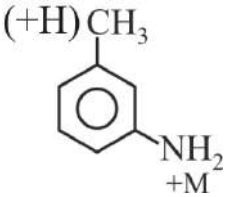


Reaction is known as Reimer teimann reaction.

52. **Ans (1)**

F^{Θ} is the best nucleophile in the polar aprotic solvent like DMF.

53. **Ans (3)**



Most reactive due to more activating group.

54. **Ans (4)**

Rosenmund reduction can not be used for the preparation of formaldehyde, because HCOCl is unstable.

55. Ans (1)

$R-NH_2 + CHCl_3 + 3KOH \longrightarrow R-N\equiv C + 3KCl + 3H_2O$

This reaction is known as carbylamine reaction (isocyanide test)

56. Ans (1)

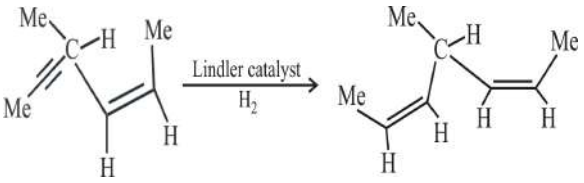
$R-CO-\boxed{OCOR + H}-NH-R' \longrightarrow R-\underset{\underset{O}{\|}}{C}-NH-R' + R-\underset{\underset{O}{\|}}{C}-OH$

(Amide)

58. Ans (4)

Heat of hydrogenation $\propto \frac{1}{\text{Stability of Alkene}}$

59. Ans (2)



In product, chiral centre absent, so it is an optically inactive compound.

61. Ans (1)

Reactivity towards $S_N2 \propto \frac{1}{\text{Steric hinderance}}$

CH_3-CH_2-Cl is least sterically hindered.

62. Ans (1)

$CH_2 = CH - CH_2 - C \equiv N$

σ-bond		π-bond
9		3
Ratio 3	:	1

63. Ans (3)

$2NH_3 \rightarrow N_2 + 3H_2$

10L 5L 15L

Change in volume = 20 – 10 = 10L

64. Ans (2)

Greater the value of $(n + \ell)$ more will be the energy of orbital. If two orbitals have same $(n + \ell)$ value then the orbital having greater n value have greater energy.

65. Ans (1)

$Ag_2CrO_{4(s)} \rightleftharpoons 2Ag^+_{(aq)} + CrO^{2-}_{4(aq)}$

$K_{sp} = [Ag^+]^2\,[CrO_4^{2-}]$

66. Ans (3)

$\Delta G° = -2.303\ RT \log K_C$

if $K_C = 1$ then $\Delta G° = 0$

67. Ans (2)

Enthalpy of neutralisation is $-57.2\ kJ\ eq^{-1}$ for a strong acid and a strong base.

68. Ans (1)

$CH_3 - \overset{\overset{O}{\|}}{\underset{}{S}}(=O) - CH_3$ (O: -2, S: $+2$)

S = zero

71. Ans (1)

Chromatographic separation work on adsorption theory.

72. Ans (1)

$(t_{1/2}) \propto P^{\circ}$

74. Ans (2)

5 L H_2O_2 produces 50 L of O_2

1 L H_2O_2 produces 10L of O_2

Volume strength = 10 V

75. Ans (2)

$S - S^- \rightarrow$ Exothermic process

$O^- \rightarrow O^{-2}$ Endothermic process

$Sr \rightarrow Sr^{+2}$ Endothermic process

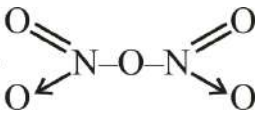
(inert gas configuration)

$N^- \rightarrow N$ (Half filled configuration)

76. Ans (2)

$\underset{\text{Size of Central atom} \uparrow \Rightarrow \text{Bond angle} \downarrow}{\xrightarrow{H_2O > H_2S > H_2Se > H_2Te}}$

77. Ans (1)

$N_2O_5 \Rightarrow$ 

⇒ Covalent and coordinate bonds are present.

79. Ans (4)

$CaCO_3 \xrightarrow{\Delta} CaO + CO_2$

(A) (B) (C)

$CaO + H_2O \rightarrow Ca(OH)_2$

(B) (D)

$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 \downarrow$

(D) (C) (Milky)

80. **Ans (3)**

Mn is in highest O.S. in $KMnO_4$

$KI \xrightarrow{O_3} I_2$

$FeSO_4 \xrightarrow{O_3} Fe_2(SO_4)_3$

F_2 is strongest O.A.

$K_2\overset{+6}{Mn}O_4 \xrightarrow{O_3} \overset{+7}{K}MnO_4$

81. **Ans (3)**

(1) MP $\propto$ No. of unpaired e^-

$\Rightarrow$ Cr will have maximum mpt among given elements.

(2) Acidic nature $\propto$ +ve O.S.

So Mn_2O_7 will be maximum acidic among given species

(3) $F_2 > Cl_2 > Br_2$ (Oxidising power)

$\Rightarrow$ Correct order is given.

82. **Ans (2)**

$Na_4[Fe(CN)_5NOS] \Rightarrow NO = +1\ S = -2\ CN = -1$

$\Rightarrow + 4 + x + 5(-1) + (+1) + (-2) = 0$

$= x = +2$

83. **Ans (1)**

Auto reduction is used for Cu, Pb, Hg.

84. **Ans (2)**

Due to back bonding

85. **Ans (4)**

Chain controlling unit of silicone is R_3SiCl

SECTION - B

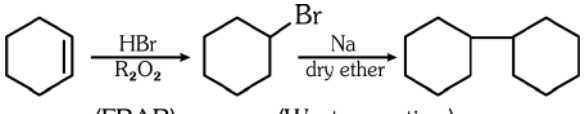
86. **Ans (2)**

Fact

87. **Ans (1)**

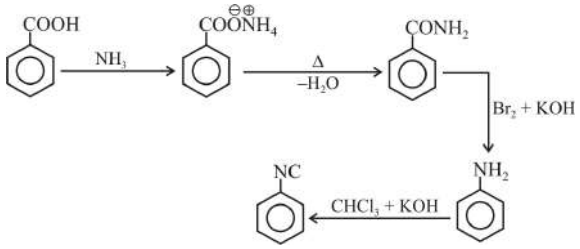
Nylon 6, 6 has amide linkage.

89. **Ans (2)**



(FRAR) (Wurtz reaction)

90. **Ans (4)**



91. **Ans (3)**

$\frac{1}{5} \times P_A^o + \frac{4}{5} \times P_B^o = 560$ .....(1)

$\frac{1}{4} \times P_A^o + \frac{3}{4} \times P_B^o = 550$ .....(2)

(1) – (2) $\times \frac{4}{5}$

$\frac{P_B^o}{5} = 120 \Rightarrow P_B^o = 600$

From eq (1) $P_A^o = 400$

92. **Ans (3)**

$\Delta_f H = 81.46 - 2 \times 285.78 - (-367.54)$

$= 449 - 571.56$

$= -112.56$ kJ

93. **Ans (3)**

half life for first order reaction

$t_{3/4} = 2t_{1/2}$

$t_{1/2} = \frac{4}{2} = 2$hr

$100 \xrightarrow[2\text{ hr}]{} 50 \xrightarrow[2\text{ hr}]{} 25 \xrightarrow[2\text{ hr}]{} 12.5 \xrightarrow[2\text{ hr}]{} 6.25$

time required for completion of 93.75% = 8 hrs.

96. **Ans (3)**

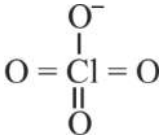
BeO $\rightarrow$ Amphoteric

While rest of oxides are basic.

97. **Ans (1)**

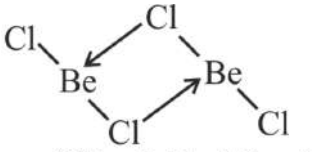
Polarity of bond $\propto \Delta EN$

98. **Ans (4)**



$\Rightarrow$ Three π-Bonds are formed by non axial set of d-orbital of Cl.

99. **Ans (2)**



(Chlorobridged dimer)

100. Ans (4)

$TiF_6^{-2} \Rightarrow Ti^{+4} \rightarrow d^{\circ} \rightarrow$ colourless

$Cu_2^{+1}Cl_2 \Rightarrow Cu^{+} \rightarrow d^{10} \rightarrow$ colourless

SUBJECT : BOTANY

SECTION - A

108. Ans (2)

NCERT (XII) Pg. # 173, Para 1

114. Ans (4)

NCERT 11, Pg.# 265

115. Ans (2)

NCERT XIIth Pg.#284

117. Ans (4)

NCERT (XI) Pg. # 17

118. Ans (2)

NCERT (XIth) Pg. # 32

119. Ans (1)

NCERT XI, Page # 36

120. Ans (1)

Sphagnum, Equisetum, Polytrichum, Funaria, Adiantum, Marchantia

121. Ans (2)

Rhizome of turmeric, Bulb of onion, Potato tubers are modification of stem.

122. Ans (2)

NCERT (XI) Pg. # 79

123. Ans (2)

A, B and C are correct.

125. Ans (2)

NCERT XII Pg. # 4,

127. Ans (4)

NCERT Pg. # 34, Para-I

128. Ans (3)

NCERT (XII) Pg. # 6,7

130. Ans (1)

NCERT Pg. # 165, 166 Fig. 10.2 (b, d, e)

SECTION - B

139. Ans (1)

NCERT 12th Pg. # 104

146. Ans (4)

NCERT-XI, Pg No. # 94 (E)

147. Ans (1)

Microspore mother cell, ovary, anther, stigma, nucellus

SUBJECT : ZOOLOGY

SECTION - A

151. Ans (3)

NCERT XI Page No. 146

153. Ans (3)

NCERT XII Pg # 198

155. Ans (3)

NCERT Pg.# 211

157. Ans (2)

NCERT XII Pg. # 214

161. Ans (2)

NCERT XI, Page # 109

169. Ans (3)

NCERT Pg.#286

175. Ans (2)

NCERT Pg. # 47 Para-3.3

176. Ans (1)

NCERT Pg. # 212 (E), 231 (H)

178. Ans (2)

NCERT(XII) Pg#140/151(H) Para:7.9

179. Ans (1)

NCERT(XII) Pg#131/142(H) Para:7.3

184. Ans (2)

NCERT Pg. # 331,333,334

185. Ans (4)

NCERT, Pg. # 336

SECTION - B

191. Ans (3)

NCERT Pg. # 119