meritroot
STRONG ROOTS CREATE MERIT

NEET MOCK TEST-04

Time : 3.00Hrs | **200 MCQs PATTERN** | **Max.Marks.720**

ANSWERS AND SOLUTIONS

PHYSICS

1) **2**	2) **4**	3) **2**	4) **2**	5) **2**	6) **2**	7) **3**	8) **2**	9) **1**	10) **4**
11) **2**	12) **1**	13) **2**	14) **1**	15) **4**	16) **1**	17) **1**	18) **1**	19) **3**	20) **4**
21) **2**	22) **1**	23) **2**	24) **4**	25) **4**	26) **4**	27) **4**	28) **1**	29) **4**	30) **3**
31) **2**	32) **3**	33) **2**	34) **2**	35) **3**	36) **3**	37) **1**	38) **1**	39) **4**	40) **4**
41) **1**	42) **3**	43) **2**	44) **4**	45) **4**	46) **4**	47) **4**	48) **2**	49) **1**	50) **3**

CHEMISTRY

51) **2**	52) **1**	53) **1**	54) **3**	55) **3**	56) **4**	57) **3**	58) **2**	59) **2**	60) **1**
61) **1**	62) **4**	63) **3**	64) **4**	65) **3**	66) **2**	67) **3**	68) **4**	69) **3**	70) **3**
71) **3**	72) **3**	73) **4**	74) **2**	75) **3**	76) **3**	77) **3**	78) **4**	79) **4**	80) **4**
81) **2**	82) **2**	83) **1**	84) **3**	85) **4**	86) **3**	87) **2**	88) **2**	89) **1**	90) **1**
91) **2**	92) **3**	93) **4**	94) **3**	95) **2**	96) **2**	97) **3**	98) **4**	99) **3**	100) **2**

BOTANY

101) **1**	102) **4**	103) **3**	104) **3**	105) **1**	106) **3**	107) **3**	108) **2**	109) **1**	110) **2**
111) **2**	112) **1**	113) **4**	114) **4**	115) **2**	116) **3**	117) **1**	118) **4**	119) **1**	120) **4**
121) **4**	122) **4**	123) **2**	124) **3**	125) **3**	126) **3**	127) **3**	128) **4**	129) **2**	130) **1**
131) **1**	132) **2**	133) **4**	134) **2**	135) **3**	136) **3**	137) **2**	138) **2**	139) **4**	140) **4**
141) **3**	142) **4**	143) **3**	144) **1**	145) **4**	146) **3**	147) **3**	148) **3**	149) **1**	150) **4**

ZOOLOGY

151) **1**	152) **4**	153) **2**	154) **4**	155) **1**	156) **2**	157) **4**	158) **4**	159) **3**	160) **4**
161) **2**	162) **2**	163) **4**	164) **2**	165) **2**	166) **2**	167) **4**	168) **3**	169) **3**	170) **2**
171) **2**	172) **2**	173) **1**	174) **3**	175) **1**	176) **3**	177) **2**	178) **1**	179) **2**	180) **3**
181) **3**	182) **3**	183) **2**	184) **3**	185) **4**	186) **3**	187) **2**	188) **2**	189) **3**	190) **2**
191) **1**	192) **2**	193) **3**	194) **2**	195) **3**	196) **3**	197) **1**	198) **3**	199) **2**	200) **3**

SOLUTIONS

1. Ans (2)

$$I = \frac{1}{2}MR^2$$

When the cylinder rails down the inclined plane from a vertical height h its potential energy Mgh is partly convened into translations kinetic energy $\frac{1}{2}Mv^2$. and partly into rotational kinetic energy . Therefore,

Mgh = $\frac{1}{2}Mv^2+\frac{1}{2}I\omega^2$

$=\frac{1}{2}Mv^2+\frac{1}{2}\left(\frac{1}{2}MR^2\right)\omega^2$

$=\frac{1}{2}M\left(R\omega\right)^2+\frac{1}{2}MR^2\omega^2\left(\because R\omega\right)$

Mgh = $\frac{3}{4}MR^2\omega^2$

$\omega=\sqrt{\frac{4gh}{3R^2}}=\frac{2}{R}\sqrt{\frac{gh}{3}}$

2. Ans (4)
r ∝ $A^{1/3}$

3. Ans (2)

$P=\left(\frac{1}{f_1}+\frac{1}{f_2}\right)\times 100$ D if f_1 & f_2 are cm

$\frac{1}{f_1}=\left(\frac{3}{2}-1\right)\left(0-\frac{1}{-10}\right)=\frac{1}{20}$

$\frac{1}{f_2}=\left(2-1\right)\left(-\frac{1}{10}-0\right)=-\frac{1}{10}$

$D=\left(\frac{1}{20}-\frac{1}{10}\right)\times 100=-5D$

4. Ans (2)
By balancing equation.
$_{92}U^{235} + {}_0n^1 \rightarrow {}_{56}Ba^{144} + {}_ZX^A + 3\ {}_0n^1$
Z = 92 – 56 = 36, A = 235 + 1 – 144 – 3 = 89

5. Ans (2)

E = $\frac{V_0}{d}$ ⇒ V_0 = Ed

= $(6 \times 10^5) \times (500 \times 10^{-9})$

V_0 = 0.3 V

6. Ans (2)
Use E = I(R + r)
E= 0.5 (2 + r) .....(1)
E = 0.25 (5 + r) .....(2)
by eq (1) & (2) E = 1.5 V

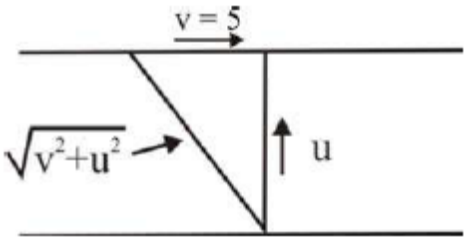
7. Ans (3)

$$\beta 1 = \frac{\lambda_1 D}{d} = \frac{6000 \times 10^{-10} \times 1}{10^{-3}} = 0.6mm$$

$$\beta 2 = \frac{\lambda_2 D}{d} = 0.45mm$$

Let n_1th maxima of λ_1 and n_2th maxima of λ_2 coincide at a position y.
then, $y = n_1 \beta_2 = n_2 \beta_2$ = LCM of β_1 and β_2
$\Rightarrow$ y = LCM of 0.6 mm and 0.45 mm
y = 1.8 mm
At this point 3rd maxima for 6000 Å & 4th maxima for 4500 Å coincide

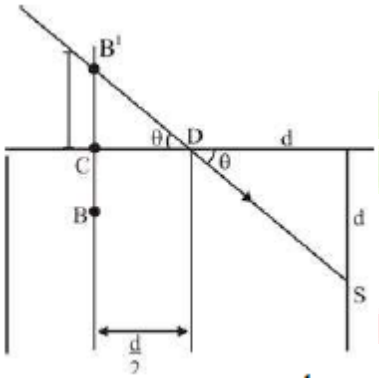
8. Ans (2)



$u = \frac{60}{5}$ = 12 m/s , v = 5 m/s

$\sqrt{v^2+u^2} = \sqrt{5^2+12^2} = 13$ m/s

9. Ans (1)



$\tan\theta = \frac{d}{d} = 1 = \frac{CB^1}{CD} = \frac{CB^1}{d/2}$

$CB^1 = \frac{d}{2} \Rightarrow CB = \frac{d}{2}$ = 1 m

10. Ans (4)

$y = \overline{\overline{A}+\overline{B}} = A + B = \overline{AB}$ NAND gate

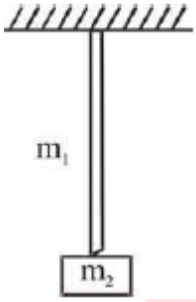
11. Ans (2)

$$V = \sqrt{\frac{T}{\mu}} \Rightarrow V_1 = \sqrt{\frac{m_2 g}{\mu}}$$

$\Rightarrow V_2 = \sqrt{\frac{(m_1 + m_2)g}{\mu}}$

V = fλ

λ ∝ V



$\frac{\lambda_1}{\lambda_2} = \frac{V_1}{V_2}$

$\frac{\lambda_2}{\lambda_1} = \sqrt{\frac{m_1 + m_2}{m_2}}$

12. Ans (1)

g = $\frac{4}{3}\pi R\rho g$

g ∝ρ

13. Ans (2)

λ = 1Å

λ = 0.5 Å

∴ V = $\frac{150}{\lambda_e^2}$

$V_1 = \frac{150}{(1)^2}$ = –150volt, E_1 = 150 eV

$V_2 = \frac{150}{(0.5)^2} = \frac{150}{0.25}$ = 600 volt, E_2 = 600 eV

ΔE = $E_2 - E_1$ = 600 –150 = 450 eV

14. Ans (1)

Electric field lines are coming out from positive charge and ends to negative charge, so A is positive, B is negative total number of electric field lines are more A than B so |A| > |B|.

15. Ans (4)

$g_E = \frac{GM_E}{R_E^2}$, $g_M = \frac{GM_M}{R_M^2}$

$g_m = \frac{G(0.1M_E)}{(0.5R_E)^2} = 0.4g_E$

16. Ans (1)

Work against friction is
W = fd = μNd = μmgd cosθ (∴ N = mgcosθ)
= 0.1 × 1 kg × 10 ms × cos 30° × 10m
= 8.7 J

17. Ans (1)
For floating body W = Th = $V_{in}\rho_L g$
AH $\rho_B g$ = (Ah) × $3\rho_B g$

$$\frac{h}{H}=\frac{1}{3}$$

Exposed height ratio = $\frac{H-h}{H}=\frac{3-1}{3}=\frac{2}{3}$

18. Ans (1)

$$\int ds=\int_1^2 vdt=\int_1^2\left(4t^3+3t^2-1\right)dt$$

$s = \left[t^4+t^3-t\right]_1^2$ = 21 m

19. Ans (3)

$$C=\sqrt{\frac{3PV}{M}}$$

$$=\sqrt{\frac{3\times 24\times 10^5\times 10\times 1000}{20}}\ \text{cms}^{-1}$$

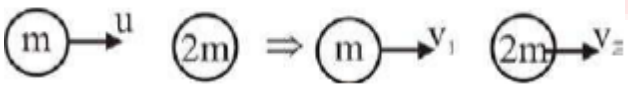
= 6×10^4 cm s^{-1} = 600 ms^{-1}

20. Ans (4)

$$a=\frac{5g-4g}{9}=\frac{g}{9}$$

$$T_{AB}-1g=1\times\frac{g}{9}\Rightarrow T_{AB}=\frac{10g}{9}$$

21. Ans (2)
Let mass of neutron = m, then mass of deutron = 2m



By momentum conservation
$mu = mv_1 + 2mV_2 \Rightarrow u = v_1 + 2v_2$ ..... (1)

$e=\frac{v_2-v_1}{u}=1$ (Elastic collision) $u = v_2 – v_1$ ..... (2)

by equation (1) & (2) $v_1=-\frac{u}{3}$

Fractional loss of KE of neutron = $\frac{KE_i-KE_f}{KE_i}$

$$= \frac{\frac{1}{2}mu^2 - \frac{1}{2}m\left(\frac{u}{3}\right)^2}{\frac{1}{2}mu^2} = 1 - \frac{1}{9} = \frac{8}{9}$$

22. Ans (1)
According to question
$$\left(\pi R^2\right) = \frac{dB}{dt} = 2\pi rE$$
where B = $\mu_0 nI$
Therefore E= $\frac{\mu_0 nI_0 \omega R^2}{2r}\sin\omega t$

23. Ans (2)
The force acting on the elementary portion of the current carrying conductor is given as
dF = i(dr)B sin 90°
= iB dr
The toque applied by dF about O.
dτ = rdF
The total torque about O,
$$\tau = \int d\tau = \int_0^1 r\left(iB\right)dr = \frac{iBL^2}{2}$$
The angular acceleration,
$$\alpha = \frac{\tau}{i} = \frac{iBL^2/2}{mL^2/3} = \frac{3iB}{2m}$$

24. Ans (4)
At extreme position kinetic energy is zero, total energy in the form of potential energy.
At equilibrium kinetic energy is maximum but potential energy may or may not be zero.
(Example vertical oscilations of spring)

25. Ans (4)
$$U_i = \frac{q^2}{2\times 2},\ U_f = \frac{q^2}{2\times(2+8)} = \frac{U_i}{5}$$
$$\%\ \text{loss} = \frac{U_i - U_f}{U_i}\times 100 = \frac{U_i - U_{i/5}}{U_i}\times 100 = 80\%$$

26. Ans (4)
$$\cos\theta = \frac{\vec{A},\vec{B}}{AB} = \frac{\left(6\hat{i}+6\hat{j}-3\hat{k}\right).\left(7\hat{i}+4\hat{j}+4\hat{k}\right)}{\sqrt{6^2+6^2+3^2}\sqrt{7^2+4^2+4^2}}$$
$$\cos\theta = \frac{42+24-12}{9\times 9} = \frac{54}{9\times 9} = \frac{2}{3}$$

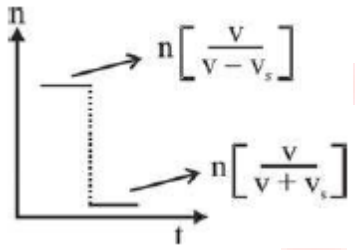
sinθ = $\sqrt{1-\cos^2\theta} = \frac{\sqrt{5}}{3}$

27. Ans (4)

$\xrightarrow[Source]{V_S}$ Observer Velocity = 0

When Approaching = $n\left[\frac{V}{V-V_S}\right]$

When it's going away = $n\left[\frac{V}{V+V_S}\right]$



28. Ans (1)

1 kilo watt hour = $10^3 \times 3600$ Joule

$= 3.6 \times 10^6$ joule

29. Ans (4)

Brown.Black × 10 Green ± Gold

$\Rightarrow 10 \times 10^5 \pm 5\% \Rightarrow 10^6 \pm 5\%$

30. Ans (3)

$\Delta K = W = \int_{r_1}^{r_2} \vec{F}.d\vec{r}$

$= \int_{(2,3)}^{(3,0)} \left(3x^2\hat{i} + 4\hat{j}\right).\left(dx\hat{i} + dy\hat{j}\right)$

$= 3\int_2^3 x^2dx + 4\int_3^0 dy = 7$ Joule

31. Ans (2)

$\lambda_e = \lambda_{ph}$

$E_{ph} = \frac{hc}{\lambda_{ph}}$; $P_e = \frac{h}{\lambda_e}$

$\frac{E_{Ph}}{P_e} = \frac{\frac{hc}{\lambda_{Ph}}}{\frac{h}{\lambda_e}} = C$

32. Ans (3)

$I_1 = I_2 \Rightarrow \frac{2}{3}MR_1^2 = \frac{2}{5}MR_2^2$

$\Rightarrow 5R_1^2 = 3R_2^2 \Rightarrow \frac{R_1}{R_2} = \sqrt{\frac{3}{5}}$

33. Ans (2)

$(I_{res})_A = I + I + 2\sqrt{I}\sqrt{I}\cos 0^0$

$(I_{res})_A = 4I$

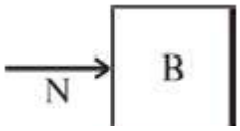
$(I_{res})_B = I + I + 2\sqrt{I}\sqrt{I}\cos 90^0$

$(I_{res})_B = 2I$

$\frac{(I_{res})_A}{(I_{res})_B} = \frac{4I}{2I} = \frac{2}{1}$

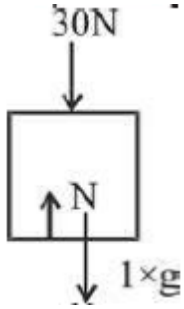
34. Ans (2)

(1) a = $\frac{50}{2}$ = 25 m/sec^2



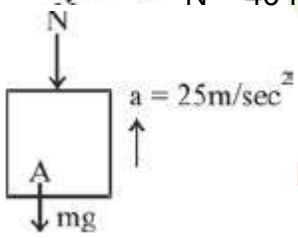
⇒ N = 1 × a = 25 Newton

(2)



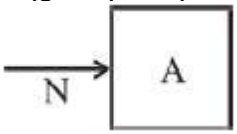
N = 40 Newton

(3)



N = m(ga+a) = 1(10 + 25) = 35 Newton

(4)



N = ma = N = 1 × 35 = 35 Newton

35. Ans (3)

a + b = 14 ± 0.14 ⇒ % error = $\frac{0.14}{14} \times 100 = 1\%$

a – b = 2 ± 0.14 ⇒ % error = $\frac{0.14}{2}\times 100 = 7\%$

a × b = 48 ± 0.96 ⇒ % error = $\frac{0.96}{48}\times 100 = 2\%$

so, order of % error x < z < y

36. Ans (3)

$m\omega_{max}^2 r = T_{max}$

37. Ans (1)

The direction of polarization is parallel to electric field

$\therefore \vec{X} \parallel \vec{E}$

The direction of the propagation of the wave is parallel to $\vec{K}\times\vec{B}$

$\therefore \vec{E} \parallel \vec{E}\times\vec{B}$

38. Ans (1)

R = 500 Ω

$X_L = \omega \times L = 1000 \times 0.5 = 500$

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

39. Ans (4)

$\bar{A}.\left(\overline{A+B}\right) = \overline{(A)+(A+B)} = \overline{A+B}$

40. Ans (4)

For uniform temperature on heating the rod, K should be infinite.

41. Ans (1)

$P_1 + \frac{1}{2}\rho v_1^2 = P_2 + \frac{1}{2}\rho v_2^2$

$P + \frac{1}{2}\rho v^2 = \frac{P}{2} + \frac{1}{2}\rho v'^2$

$\left(P - \frac{P}{2}\right) + \frac{1}{2}\rho V^2 = \frac{1}{2}\rho V'^2$

$V' = \sqrt{\frac{P}{\rho} + V^2}$

42. Ans (3)

$P_2 = P_1\left(\frac{V_1}{V_2}\right)^{\gamma}$

(Adiabatic because sudden process)

$r = \frac{3}{2}$, $V_2 = \frac{V_1}{4}$, P_1 = 1 atm

$P_2 = 1(4)^{3/2} = 8$ atm

43. Ans (2)

Potential energy = KE at large separation

$$\frac{1}{2}\times\frac{(e)(e)}{4\pi\varepsilon_0 r}=\frac{KE\ at\ 1\arg e\ separation}{2}$$

= KE of each proton

KE of each proton

$$=\frac{1}{2}\times\frac{9\times10^{9}\times\left(1.6\times10^{-19}\right)^{2}}{10^{-10}}$$

$= 11.52 \times 10^{-19}$ J.

44. Ans (4)

Magnetic field can be produced by moving charge and changing electric field.

45. Ans (4)

$$E=\frac{3NKT}{2},\ V_{rms}=\sqrt{\frac{3KT}{m}}$$

$T_1 = 300$ K, $T_2 = 600$ K

$$\frac{E_2}{E_1}=\frac{T_2}{T_1}=2\Rightarrow E_2 = 2E_1$$

$E_2 = 2 \times 6.21 \times 10^{-21} = 12.42 \times 10^{-21}$ J

$$\frac{V_2}{V_1}=\sqrt{\frac{T_2}{T_1}}=\sqrt{2}\Rightarrow V_2=484\times\sqrt{2}$$

$V_2 = 684$ m/s

46. $$\frac{hc}{6000}=\phi+k$$

$$\frac{hc}{4000}=\phi+2k$$

$$\therefore \phi=1.03eV$$

47. Answer (4)

48. $$\frac{50}{20}=2.5mA$$

$$\frac{200-50}{5}=30mA$$

$$I_0=30-2.5$$

$$=27.5mA$$

49. $$I=\frac{1}{2}MR^2=\frac{1}{2}\pi R^2 t\rho R^2$$

$$\therefore \frac{I_Y}{I_X}=64$$

50. Answer (3)

$\pi\omega A = \omega^2 A \qquad \therefore \omega = \pi$

$\therefore T = \frac{2\pi}{\omega} = 2s$

KE has double frequency has half time period. So KE time period is 1s

CHEMISTRY

51 ANS(2)

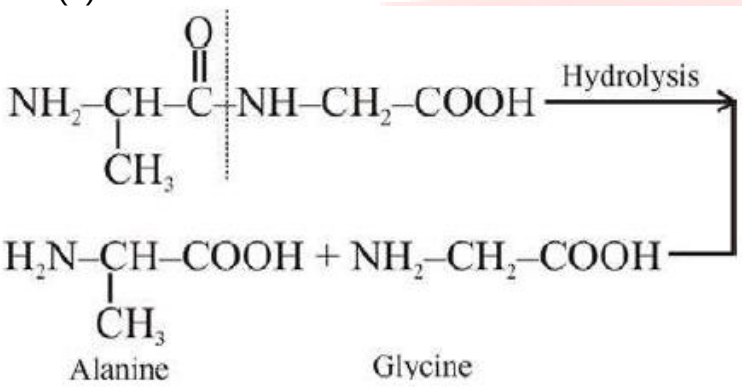
52. Ans (1)

$\Delta H = \Delta H_1 + \Delta H_2 + \Delta H_3 + \Delta H_4$

53. Ans (1)

$NaOH + Zn \longrightarrow Na_2ZnO_2 + H_2$

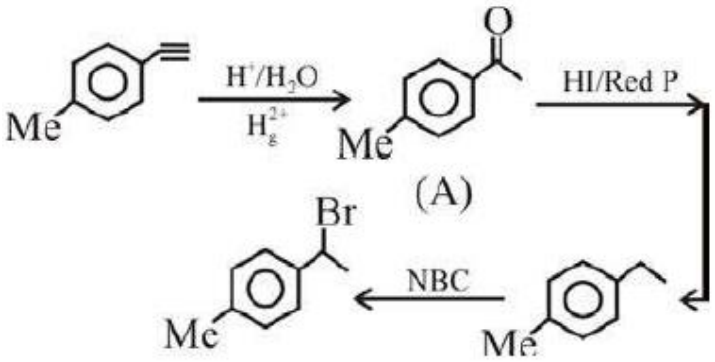
54. Ans (3)



55. Ans (3)

$K_b = \frac{RTb^2}{1000L_v} \quad K_f = \frac{RT_f^{\ 2}}{1000L_f}$

56. Ans (4)



57. Ans (3)

Concept

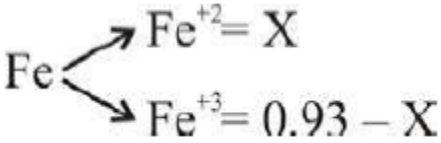
58. Ans (2)

Antiaromatic

59. Ans (2)
Lanthanoides (Ln) + acids → H_2 + H_2O →$Ln(OH)_3$ + H_2

60. Ans (1)
NCERT-XII, Part-II, Page # 430

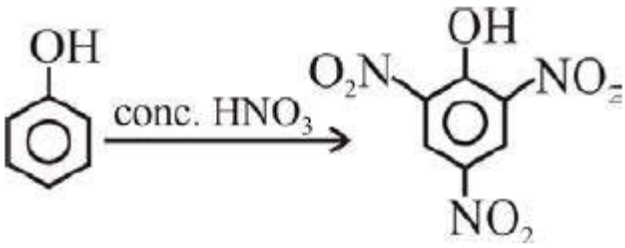
61. Ans (1)



X(+2) + 3(0.93 – x) – 2 = 0
X = 0.79
Fe^{+2} = 0.79 Fe^{+3} = 0.14

% Fe^{+3} = $\frac{0.14}{0.93}\times 100 = 15\%$

64. Ans (4)

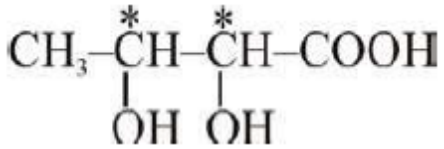


67. Ans (3)

Non planer
Non Aromatic

68. Ans (4)
NCERT XIIth Pg. # 373

69. Ans (3)



$2^2 = 4$

70.

71. Ans (3)

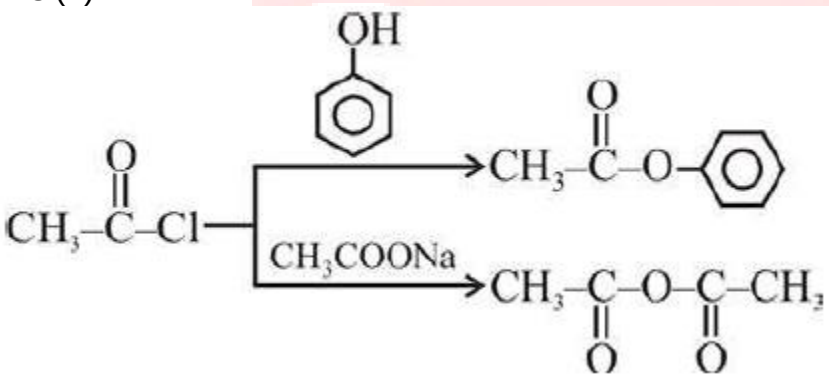
In CsCl $Cs^+ \rightarrow$ at body center

$Cl^- \rightarrow$ at every corner

$2(r_c + r_a) = \sqrt{3}\,a$ (along body diagonal)

$rc + ra = \frac{\sqrt{3}a}{2}$

78. Ans (4)



80. Ans (4)

$PCl_5 \rightleftharpoons$	PCl_3	+	Cl_2
1	0		0
$1-\alpha$	α		α

$\sum n = 1+\alpha$

$K_P = \frac{\alpha^2}{(1-\alpha)} \times \left[\frac{P}{(1+\alpha)}\right]^1$

$K_P = \frac{\alpha^2}{1-\alpha^2} \square \alpha^2 P$

$\alpha_1^2 P_1 = \alpha_2^2 P_2$

$(0.02)^2 \times 1 = (0.04)^2 . P_2$

$\Rightarrow P_2 = 0.25$ atm

$= \frac{1}{4}$ atm

81.

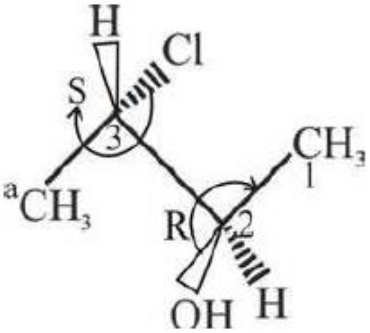
82. Ans (2)

$C_2H_4(g) + 3O_2(g) \rightleftharpoons 2CO_2(g) + 2H_2O(\ell)$

$\frac{560}{28}$ mol $\frac{560}{28}\times 3$ mol

${}^{m}O_2 \frac{560\times 3}{28}\times 32$ = 1.92 kg

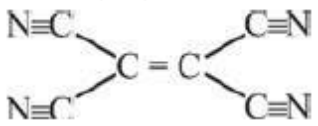
84. Ans (3)



85. Ans (4)

$$\frac{(t_{1/2})_r}{(t_{1/2})_r} = \left(\frac{[A_0]_{II}}{[A_0]_I}\right)^{n-1}$$

86. Ans (3)



No. of π bond = 9

No. of π electrons = 18

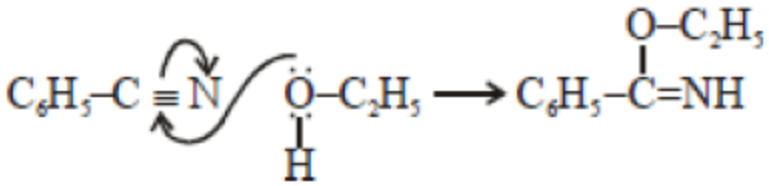
87. Ans (2)

In pseudo halide 'N' must be present.

90. Ans (1)

ΔG = ΔH – T.ΔS

94. Ans (3)



95. Ans (2)

H_2 /Ni/D reduce - CHO and multiple bond.

96. $H_2 + \frac{1}{2}O_2 \rightarrow H_2O$ is the correct equation of $\Delta_f H(H_2O)$

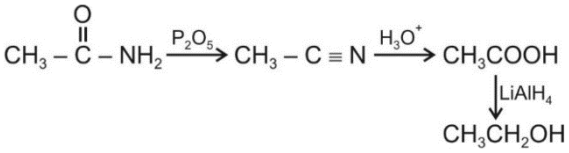
97. $K_a = \frac{[CH_3COO^-][H^+]}{[CH_3COOH]}$

$10^{-5} = \frac{(0.1\alpha)(0.1\alpha + 0.1)}{0.1 - 0.1\alpha}$

$10^{-5} = \frac{(0.1\alpha)(0.1)}{(0.1)}$

$\alpha = 10^{-4}$

98.



99. Concentrated Concentrated solution of alkali metals in liquid ammonia changes from blue colour to bronze colour.

100. Answer (2)
Highest number of resonating structures.

104. Ans (4) NCERT pg.# 219
107. Ans (4) NCERT-XI- 317-318
114. Ans (4) NCERT-XI- 101, 102, 104
115. Ans (3) NCERT-XI- 292,293
117. Ans (4) NCERT-XI- 104
128. Ans (4) NCERT (XIth) Pg.#218-220
131. Ans (4) NCERT-XI- 265, 264
140. Ans (3) NCERT-XI- 271,272
143. Ans (1) NCERT-XI- 314
145. Ans (2) NCERT-XI- 314

146 Answer (3)
In Cassia, imbricate aestivation is found.

147 Answer (3)
Vascular cambium is a secondary meristem.

148 Answer (3)
Lysosomes has acid hydrolases enzymes.

149 Answer (1)
Meiocytes $\rightarrow$ 2n = 24
Number of bivalents = Number of haploid set of chromosomes.
Each bivalent is tetrad with four chromatids.

150 Answer (4)
In a plasmolysed cell DPD is very high and pressure potential is negative.

153. Ans (2) NCERT-XI- 324
154. Ans (3) Module (E) Pg. # 138, (H) Pg. # 150
169. Ans (3) NCERT-XI- 338
176. Ans (3) NCERT-XI- 263
183. Ans (3) NCERT-XI- 53, 54
185. Ans (1) NCERT-XI- 331,332, 333
186. Ans (2) NCERT-XI- 325
195. Ans (3) NCERT-XI- 279

196 Answer (3)
Intercalated discs at some fusion points allow the cells to contract as a unit.

197 Answer (1)
Adenylate cyclase is an enzyme which converts ATP into c-AMP

198 Answer (3)
Ozone is beneficial when present in stratosphere.

199 Answer (2)
This process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography is called adaptive radiation.

200. Answer (3)
Such hormone analogues are employed in controlled breeding experiments like MOET.