

# NEET Like MOCK TEST-01

Time : 3.00Hrs

200 MCQs PATTERN

Max.Marks.720

## Answers and Solutions

### PHYSICS

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

### CHEMISTRY

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

### BOTANY

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

### ZOOLOGY

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

### PHYSICS

1.  $P_i = \frac{E}{C}$

$$P_f = -\frac{E}{C}$$

$$\Delta P = P_i - P_f = \frac{2E}{C}$$

2.  $\frac{1}{\lambda_1} = R \left[ \frac{1}{2^2} - \frac{1}{3^2} \right] = \frac{5R}{36}$

$$\frac{1}{\lambda_2} = R \left[ \frac{1}{2^2} - \frac{1}{4^2} \right] = \frac{3R}{16}$$

$$\frac{\lambda_2}{\lambda_1} = \frac{5R/36}{3R/16} \Rightarrow \lambda_2 = 488.9nm$$

3.  $m_1 = \pi r_1^2 \sigma = 36\pi\sigma$

$$m_2 = \pi r_2^2 \sigma = \pi\sigma$$

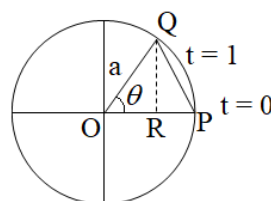
$$X_{CM} = \frac{m_1 x_1 - m_2 x_2}{m_1 - m_2}$$

$$x_1 = 0 \quad x_2 = 3$$

$$X_{CM} = -\frac{3}{35} CM$$

4.  $K_A = \frac{1}{2} I \omega^2 = \frac{1}{2} \left( \frac{2}{5} m R^2 \right) \left( \frac{V_0}{R} \right)^2$

$$K_B = \frac{1}{2} m V_0^2$$



$$\frac{K_A}{K_B} = \frac{5}{2}$$

$$5. \quad S = PQ = \sqrt{QR^2 + PR^2}$$

$$S = \sqrt{(a \sin \omega t)^2 + (a - a \cos \omega t)^2}$$

$$S = 2a \sin \frac{\omega t}{2}$$

$$6. \quad V_{rms} = \sqrt{\frac{3RT}{m}} \Rightarrow V_{rms} \propto \sqrt{T}$$

$$\therefore 2 = \sqrt{\frac{T_1}{T_2}} \Rightarrow \frac{T_2}{T_1} = \frac{1}{4}$$

During adiabatic process

$$T_1 V_1^{\gamma-1} = T_2 V_2^{\gamma-1}$$

$$\frac{V_2}{V_1} = \left( \frac{T_1}{T_2} \right)^{\frac{1}{\gamma-1}}$$

$$\frac{V_2}{V_1} = (4)^{\frac{1}{1.5-1}} = 4^2 = 16$$

$$V_2 = 16V$$

7. As the temperature increase n will increase and v will decrease

8. When battery charged  $E_1 = P_1 I_1 t_1 = 15 \times 10 \times 8 = 1200$

When discharge of battery

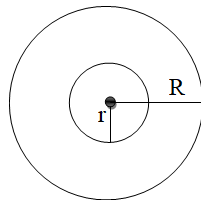
$$E_2 = V_2 I_2 t_2 = 14 \times 5 \times 15 = 1050$$

$$\eta = \frac{E_2}{E_1} \times 100$$

$$\eta = 0.875 \times 100 = 87.5\%$$

$$9. \quad \phi_{21} = \frac{\mu_0 i}{2R} \times \pi r^2$$

$$M = \frac{\phi_{21}}{i} = \frac{\pi \mu_0 r^2}{2R}$$



10. In transformer frequency remains same for input and output

11. In equilibrium position  $U = 0$

$$\frac{4}{2} \left[ 2 \left( \frac{Q^2}{4\pi\epsilon_0 a} \right) + \frac{Q^2}{4\pi\epsilon_0 \sqrt{2}a} - 4 \frac{1}{4\pi\epsilon_0} \frac{Qq}{a/\sqrt{2}} \right] = 0$$

$$\Rightarrow q = \frac{Q}{4} (1 + 2\sqrt{2})$$

$$12. \quad \frac{E_1}{E_2} = \frac{R_1}{R_2} \Rightarrow \frac{V_1}{V_2} = \frac{E_1 R_1}{E_2 R_2} = \frac{R_1}{R_2} \times \frac{R_1}{R_2} = \left( \frac{R_1}{R_2} \right)^2$$

$$13. \quad x = R \frac{L}{100-l}$$

$$\frac{\Delta x}{x} = \frac{\Delta l}{l} + \frac{\Delta l}{100-l} \Rightarrow \frac{\Delta x}{x} \times 100$$

$$= \left( \frac{1}{50} + \frac{1}{50} \right) 100 = 4\%$$

$$14. \quad V_e = \sqrt{\frac{2GM}{R}} = \sqrt{2gR}$$

$V_e$  is independent of the mass of the projectile

15.

$$T = 2\pi \sqrt{\frac{l}{g}} = 2\pi \sqrt{\frac{l(R+h)^2}{GM}} \Rightarrow T \propto (R+h)$$

$$\frac{T^1}{T} = \frac{R+h}{R} = 1 + \frac{h}{R} = 1 + \frac{1}{100}$$

$$\frac{T^1}{T} - 1 = \frac{1}{100}$$

$$\left( \frac{T^1 - T}{T} \right) \times 100 = 1\%$$

Time period increase by 1%

16. For iron wire

$$\Delta L = L \propto \Delta t = L \times 12 \times 10^{-6} \times 40 = 48L \times 10^{-5}$$

For brass tube

$$\Delta L = L \propto \Delta t = L \times 18 \times 10^{-6} \times 40$$

$$= 72L \times 10^{-5} : \Delta L_b > \Delta L_i$$

$$\text{Stress} = \frac{T}{\pi r^2} = \frac{T}{\pi (3 \times 10^{-4})^2} = \frac{T}{9\pi \times 10^{-8}}$$

$$\text{Strain} = \frac{(72L - 48L) \times 10^{-5}}{L} = 24 \times 10^{-5}$$

$$\text{Stress} = Y \times \text{Strain}$$

$$\frac{T}{9\pi \times 10^{-8}} = 21 \times 10^{10} \times 24 \times 10^{-5}$$

$$\therefore T = 14.2N$$

17. For first engine

$$Q_{in} = Q, \eta = 0.4$$

$$\therefore w = \eta Q = 0.4Q$$

$$Q_{at} = 0.6Q$$

For second engine

$$Q_{in}^1 = 0.6Q_{in} = 0.6Q$$

$$w^1 = 0.4 \times 0.6Q = 0.24Q$$

$$Q_{out}^1 = 0.6 \times 0.6Q = 0.36Q$$

Over efficiency

$$\eta = \frac{Q_{in} - Q_{out}^1}{Q_{in}} = 1 - 0.36 = 0.64$$

$$18. \quad C_p = 8, C_v = C_p - R = 8 - 2 = 6$$

$$dU = mC_v(T_2 - T_1) = 5 \times 6(20 - 10)$$

$$\therefore dU = 300 \text{ cal}$$

$$19. \quad \eta = \frac{W}{Q} = 1 - \frac{T_2}{T_1}$$

$$\frac{800}{Q} = 1 - \frac{300}{600} = \frac{1}{2}$$

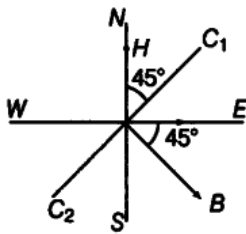
$$Q = 1600 \text{ J}$$

$$20. \quad F = \frac{\mu_0 i_1 i_2 l}{2\pi d}$$

$$\therefore F \propto \frac{1}{d}$$

Current loop move towards the wire because attraction between EF and AD is more than repulsion below EF and BC  
 $L \text{ ---} = 24 \times 10$

21.



$$B = \frac{\mu_0 2\pi i}{4\pi r} = \frac{10^{-7} \times 2 \times 3.14 \times 0.35 \times 30}{0.12}$$

$$B = 5.49 \times 10^{-5} \text{ T}$$

$$H = B \sin 45 = 5.49 \times 10^{-5} \times \frac{1}{\sqrt{2}}$$

$$H = 3.9 \times 10^{-5} \text{ T}$$

22. Rotation of the earth doesn't affect the time of flight

$$23. \quad T_{net} = \sqrt{T^2 + T^2 + 2TT \cos 120}$$

$$T_{net} = T = mg$$

$$24. \quad F_r = mg$$

$$\mu N = mg$$

$$N = \frac{mg}{\mu} = \frac{50 \times 10}{0.75} = 666.67$$

$$25. \quad M < (Zm_p + Nm_n)$$

$$26. \quad \frac{KE}{PE} = \frac{1/2 m \omega^2 (A^2 - x^2)}{1/2 m \omega^2 x^2} = \frac{A^2 - x^2}{x^2}$$

$$\frac{KE}{PE} = \frac{10^2 - 4^2}{4^2} = \frac{21}{4} = 5.25$$

$$27. \quad KE_0 = \frac{1}{2} m \omega^2 r^2 \Rightarrow r = \left( \frac{2K_0}{m\omega^2} \right)^{1/2}$$

$$Y = r \sin \omega t = \left( \frac{2K_0}{m\omega^2} \right)^{1/2} \sin \omega t$$

$$28. \quad \frac{1}{2} mv^2 = \frac{hc}{\lambda} - \phi_0$$

$$\frac{1}{2} mv^2 = 4.14 - 1 = 3.14 \text{ eV}$$

$$V = \sqrt{\frac{2 \times 3.14 \times 1.6 \times 10^{-19}}{9.1 \times 10^{-31}}} = 10^6 \text{ m/s}$$

$$29. \quad \phi = \frac{hc}{\lambda} \Rightarrow \phi \propto \frac{1}{\lambda}, \frac{\phi_1}{\phi_2} = \frac{\lambda_2}{\lambda_1} = \frac{600}{300} = \frac{2}{1}$$

$$30. \quad Q = AV$$

$$V = \frac{Q}{A} = \frac{100 \times 10^{-6}}{0.25} = 400 \times 10^{-3} \text{ mm/s}$$

$$V = 0.4 \text{ mm/s}$$

$$31. \quad W = 2TL$$

$$T = \frac{mg}{2L} = \frac{1.5 \times 10^{-2}}{2 \times 0.3} = 0.025 \text{ Nm}^{-1}$$

32. Up word pull = downward pull

$$\left( \frac{V}{2} \right) 13.6g + \frac{V}{2} \times 0.8g = V \rho g$$

$$\therefore \rho = \left( \frac{13.6 + 0.8}{2} \right) = 7.2 \text{ gcm}^{-3}$$

33.  $\mu$  is max for violet and min for red, letter appears min raised are red

34. M. I of a disc about diameter is

$$I = \frac{1}{4} MR^2$$

$$MR^2 = 4I$$

$$\text{Now required M.I} = \frac{3}{2} MR^2$$

$$\Rightarrow \frac{3}{2} (4I) = 6I$$

$$35. \quad \sum \tau = 0$$

$$\therefore L = \left( 0 + \frac{300R^2}{2} \right) \omega_0 = \left( \frac{300R^2}{2} + 30R^2 \right) \omega$$

$$150\omega_0 = 180\omega \Rightarrow \omega = \frac{5}{6} \omega_0$$

$$36. \quad \text{Voltage gain} = \frac{V_0}{V_i} = \frac{R_0 \times \Delta I_C}{R_i \times \Delta I_B}$$

$$= \frac{2000 \times 1.5 \times 10^{-3}}{150 \times 20 \times 10^{-6}} = 1000$$

37. Electrons from the n-type side cross the p - n junction and recombine with holes in the P-type side

$$38. \quad E = \frac{3}{2} \Rightarrow E \propto T$$

$$\frac{E_1}{E_2} = \frac{T_1}{T_2} \Rightarrow \frac{E}{E/2} = \frac{300}{T_2}$$

$$T_2 = 150$$

$$T_2 = 150 - 273$$

$$T_2 = -123^\circ\text{C}$$

$$39. \quad \gamma = \frac{\Delta V}{V \Delta T} = \frac{0.24}{100 \times 40} = 6 \times 10^{-5}$$

$$\therefore \alpha = \frac{\gamma}{3} = 2 \times 10^{-5} / ^\circ\text{C}$$

$$40. \quad P = \frac{a - t^2}{bx} = \frac{a}{bx} - \frac{t^2}{bx}$$

By principle of homogeneity

$$P = \frac{\text{force}}{\text{area}} = \frac{a}{b(x)}$$

$$ML^{-1}T^{-2} = \frac{a}{b} \left( \frac{1}{L} \right)$$

$$\Rightarrow \frac{a}{b} = MT^{-2}$$

41. In the presence of thin glass plate, the fringe width pattern shifts, but no change in fringe width

42. The E.M wave is propagating along the z axis

$$\vec{E} = E_0 \hat{i}, \vec{B} = B_0 \hat{j} (\hat{i} \times \hat{j} = \hat{k})$$

$$43. \quad \lambda = \frac{V}{f} = \frac{350}{500} = 0.7\text{m}$$

$$\Delta x = \Delta \phi \frac{\lambda}{2\pi}$$

$$= 60 \times \frac{\pi}{180} \times \frac{0.7}{2\pi}$$

$$\approx 0.12\text{m} \approx 12\text{cm}$$

$$44. \quad V = \frac{\omega}{K} = \frac{7\pi}{0.04\pi} = 175\text{m/s}$$

45. Work done by static friction on an object may be positive

46. Answer (3)

$$T_j = \frac{K_1 T_1 + K_2 T_2 + K_3 T_3}{K_1 + K_2 + K_3} = 45^\circ\text{C}$$

47. Answer (3)

$$w = \int p dv$$

$$\frac{pV}{R} = \frac{-T_0 V}{V_0} + 3T_0$$

$$\therefore p = \frac{-RT_0}{V_0} + \frac{3RT_0}{V}$$

$$\therefore w = RT_0 (3 \ln 2 - 1)$$

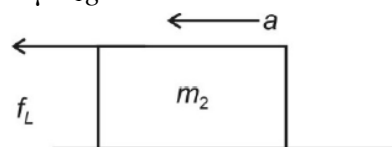
48. Answer (4)

$$\eta = 1 - \frac{T_2}{T_1}$$

$$1.2\eta = 1 - \frac{0.8T_2}{1.2T_1} = 1 - \frac{2}{3}(1 - \eta) \Rightarrow \eta = 62.5\%$$

49. Answer (1)

Lower block will move together when force acting on it is less than or equal to maximum limiting friction. Otherwise it will start slipping. Friction of lower block  $f_L = \mu m_1 g$



$$\therefore m_2 a \leq \mu m_1 g \quad a = \omega^2 \times A$$

$$m_2 \times \omega^2 A = \mu m_1 g \quad \text{Where } A = \text{max. amplitude.}$$

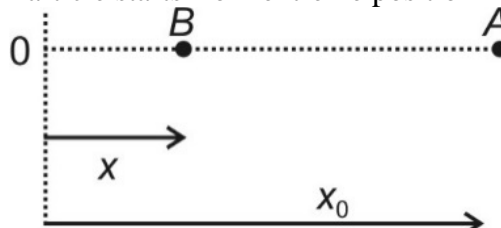
$$A = \frac{\mu m_1 g}{m_2 \omega^2} \quad \text{and} \quad \omega = \frac{2\pi}{T}$$

$$A = \frac{\mu m_1 g T^2}{m_2 \times 4\pi^2}$$

50. Answer (1)

$$x = A \cos \omega t$$

Particle starts from extreme position



At  $t = 0$ ,  $x_0 = A$

$$\text{At time } t = \frac{\pi}{6\omega}$$

$$\text{Position of particle} = x = A \cos \left( \omega \times \frac{\pi}{6\omega} \right)$$

$$= A \cos \left( \frac{\pi}{6} \right) = \frac{\sqrt{3}A}{2}$$

Distance travelled =

$$A - \frac{\sqrt{3}A}{2} = \left( \frac{2 - \sqrt{3}}{2} \right) A$$

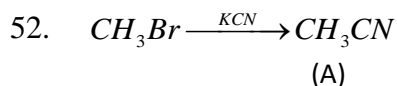
Average speed = distance / time

## CHEMISTRY

$$51. \quad pH = 7 + \frac{1}{2} (p^{k_a} - p^{k_b})$$

$$= 7 + \frac{1}{2} (3.2 - 3.4) = 7 + \frac{1}{2} (-0.2) =$$

$$= 7 - 0.1 = 6.9$$



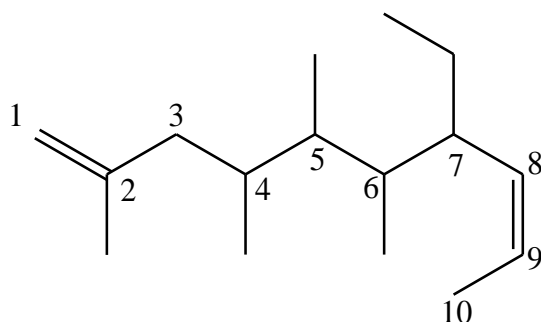
53. As positive charge on ion increases its coagulating power towards negative colloid increases.

54. Electrode with less SRP acts as anode and symbolized with negative sign.

55.  $Cu + ZnSO_4 \longrightarrow$  No reaction  
Cu has more SRP than Zn and does not oxidise.

56. Conceptual

57.



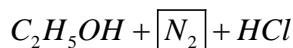
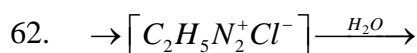
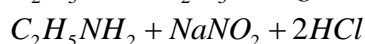
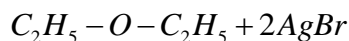
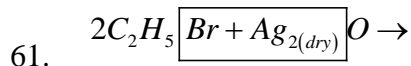
7- ethyl 2, 4, 5, 6 – tetra methyl deca-1, 8 – diene.

58. IIA group sulphates solubility  $\downarrow$  from  $BeSO_4$  to  $BaSO_4$

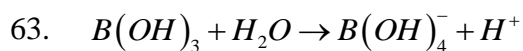
In  $BeSO_4$  (L.E < H.E)

59. Conceptual

60. Reiman – Tiemar Reaction

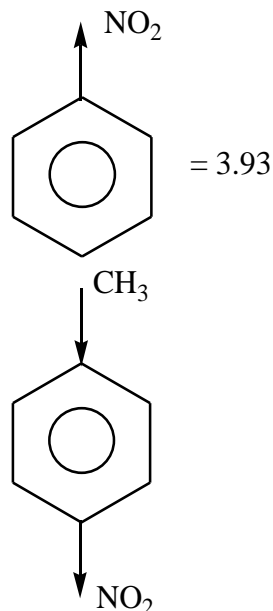
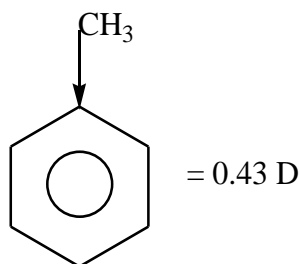


1 mole  $C_2H_5NH_2$  gives 1 mole  $N_2$  (22.4 lit at STP)

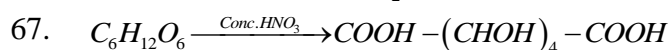
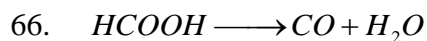


64.  $E = \frac{hc}{\lambda}; \lambda = \frac{6.62 \times 10^{-34} \times 3 \times 10^8}{2.3 \times 1.6 \times 10^{-19}} = 5.4 \times 10^{-7} m$

65.



bond moment are in same direction, so its dipole moment =  $0.43 + 3.93 = 4.36$

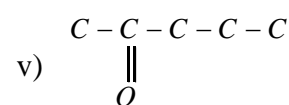
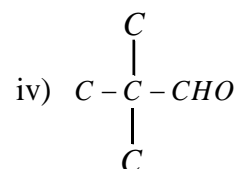
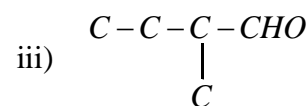
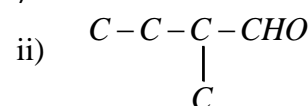
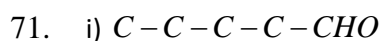
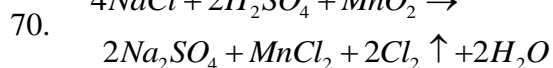
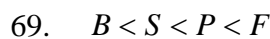


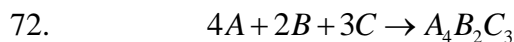
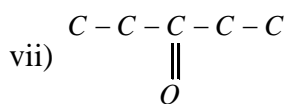
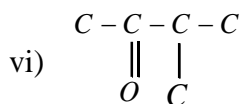
68.  $\Delta T_f = k_f m \cdot i$

$0.69 = 5.12 \times \frac{2 \times 10^{-2} \times 10^3}{94} \times \frac{1}{1} \times i$

$i = 0.63$

$L_{asso} = \frac{i-1}{\frac{1}{n}-1} = \frac{-0.37}{\frac{1}{2}-1} = \frac{-0.37}{-0.5} \approx 0.74 = 74\%$





Given  $\rightarrow 1 \quad 0.6 \quad 0.72$

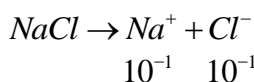
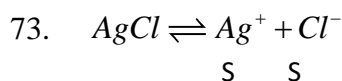
to react  $\rightarrow 1 \quad 0.5 \quad 0.75$  (more than give)

Here 'C' is limiting reagent

So, product formation depends limiting reagent  
for 3 moles of 'C'  $\rightarrow$  1 mole product

0.72  $\rightarrow ?$

$$\frac{0.72}{3} \times 1 = 0.24$$



$$K_{sp} = [Ag^+][Cl^-]$$

$$1.6 \times 10^{-10} = S \times 10^{-1}$$

$$S = 1.6 \times 10^{-9}$$



i.e given  $Cu_{1.8}S$

$\therefore n_{Cu}$  atoms  $\rightarrow 180$

$\therefore n_S$  atoms  $\rightarrow 100$

desired S - atom = 200

$\therefore$  Change deficiency = 200 - 180 = 20

$\therefore 20Cu^+$  ions transferred

$Cu^{+2}$  ion

$$\therefore \% Cu^{+2} \text{ ions} = \frac{20}{180} \times 100 = 11.11\%$$

75. At low P and High T  
Both a and b neglected in vander wall's equation

$$\therefore PV_m = RT$$



0.3 moles of Zn needed

0.6 moles of  $HCl$

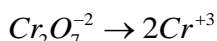
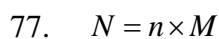
But given 0.52 moles

$\therefore HCl$  is limiting reagent

2 moles of  $HCl \rightarrow$  1 mole of  $H_2$

$0.52HCl \rightarrow x$  say

$$x = \frac{0.52}{2} = 0.26$$



+12 +6

Change in oxidation number = 6

$$\therefore n = 6$$

$$N = 6 \times 0.1 = 0.6N$$

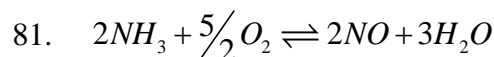
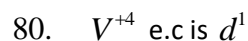
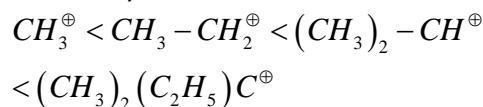
78.  $T_n = 2 + 3 + 5 + 10$

$$T_n = 20$$

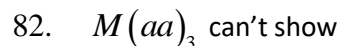
For 5 moles  $P = 1.5 \text{ atm}$

$$\therefore 20 \text{ mole} = \frac{1.5}{5} \times 20 = 6 \text{ atm}$$

79. Based on stability of  $C^+$  ion  
i.e stability



$$\therefore K_{eq} = \frac{K_2 K_3^3}{K_1}$$



geo isomerism

83.  $\Delta n = 0$

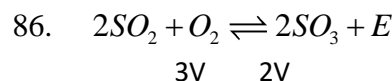
$$\therefore \Delta H = \Delta E + \Delta nRT$$

$$\therefore \Delta H = \Delta E$$

84. In simple cube

Void % = 48%

85. Lead Antidot is EDTA



$\therefore$  High P and Low T Favorable.

87.  $\pi_1 = \pi_2$

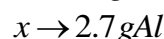
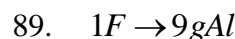
$$i_1 c_1 = i_2 c_2$$

$$i_1 \times 0.004 = 1 \times 0.01 \quad i_1 = \frac{10^{-2}}{4} \times 10^3 = 2.5$$

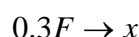
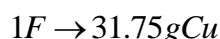
$$\alpha_{dis} = \frac{i-1}{n-1} \times 100$$

$$\alpha_{dis} = \frac{2.5-1}{3-1} \times 100 = 75\%$$

88.  $N_2O_5$  is colourless and odourless solid



$$x \rightarrow \frac{2.7}{9} = 0.3F$$

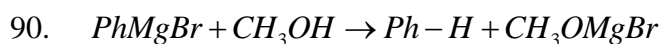


$$x = 0.3 \times 31.75$$

$$x = 9.525g$$

(or)

$$\frac{w_1}{E_1} = \frac{w_2}{E_2}$$



91.  $\Delta H_{Rxn} = H_P - H_R$   
 $\therefore = 2(-286) - 2(-88)$   
 $= -196kJ$

92. Statements only

93. No. of nucleons =  $\frac{\text{B.E of element}}{\text{B.E of Nucleon}}$   
 $= \frac{64}{6.4} = 10$

94.  $\frac{1}{5} r_{Br^-} = \frac{1}{3} r_{Br_2}$   
 $\therefore r_{Br^-} = \frac{5}{3} r_{Br_2}$   
 $\therefore r_{Br^-} = \frac{5}{3} \times 0.025 = 0.042$

95.  $K \propto \frac{1}{E_a}$   
 $K^I > K^{II}$   
 $\therefore E_a^I < E_a^{II}$

96.  $NO_2$  does not cause green house effect

97.  $P_A = P_{A\lambda A}^0 \Rightarrow P_A = \frac{2}{5} \times 100 = 40mm Hg$   
 $P_B = \frac{3}{5} \times 300 = 180mm Hg$

Mole fraction in vapour phase

$$Y_A = \frac{40}{40+180} = \frac{40}{220} = \frac{2}{11}$$

98.  $E_{red} = -0.059 \times pH$   
 $= -0.059 \times 4$   
 $= -0.0236V$

99.  $z = \frac{63.5}{2F} = \frac{63.5}{2 \times 96500}$   
 $m = zit = \frac{63.5 \times 9.65 \times 1000}{2 \times 9650}$   
 $= 3.175g$

100. It is a first order reaction as

$$K = \frac{2.303}{10} \log \frac{5}{4} = 0.023$$

Which is constant throughout

### BOTANY

101. androecium and gynoecium are essential organs of a flower.

102. After two generations of replication total four daughter DNA molecules are formed. Out of these, 2 DNAs contain heavy nitrogen  $2/4 = 50\%$

103. In basidiomycetes fungi Asexual spores generally not found

104. The cells of the embryo sac in the chalazal and are called as antipodal cells. these are also called vegetative cells of embryo sac

105. A protistan *Euglena* has the features of both plants and animals

106. entomophilous flowers produce sticky pollen grains from large and attractive coloured flowers.

107. Experiment of Griffith on *Pneumococcus* bacteria prove that transforming principle is genetic material. Later the transforming principle is proven as DNA by Hershey and Chase

108. Respiration is an energy releasing, exothermic, oxidative process

109.

Golgi apparatus	Acrosome of sperms
Ribosomes bound to ER	Secretory proteins
Microtubules	Helps in spindle formation
Spherosomes	Synthesis and storage of fats

Active trafficking from the Golgi apparatus is involved in acrosome formation in sperm. The path of a protein destined for secretion has its origin in the rough endoplasmic reticulum, a membrane-bound component in the cell. The microtubule organizing center (MTOC) is a structure found in eukaryotic cells from this microtubule emerge. MTOC has two main functions: Bihar Ganesan of eukaryotic flagella and cilia on the organisation of the mitotic and meiotic spindle apparatus, which separates the chromosomes during cell division. Spherosomes are small membrane bound organelles which take part in storage and synthesis of fats.

110. Chlorophyll and see are present in brown algae or Phaeophyceae members

111. Enzymes which are slightly different in molecular structure but can perform identical activity are called isoenzymes

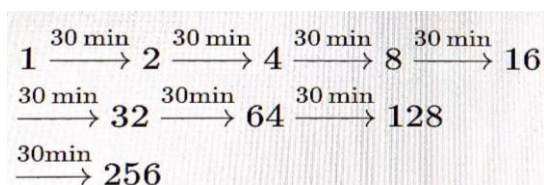
112. Culturing of shoot apex as explants on nutrient medium in tissue culture gives to disease free plants because such explants are pathogen free ( Because meristematic cells divide faster than virus replication)

113. Centriole is not present in plant cells

114. Metaphase is the best phase to study the structure of chromosomes and best suitable to develop a karyotype
  115. Cell theory was proposed by Schleiden and Schwann.
  116. If the gene of interest is inserted at Bam HI recognition site in pBR 322, the tetracycline resistant gene is altered hence transformed recombinants will not grow on tetracycline containing medium.
  117. Only the fungal partner in a lichen reproduces sexually. Many lichen fungi reproduce sexually like other fungi, producing spores formed by meiosis and fusion of gametes. Most lichen fungi belong to Ascomycetes (ascolichens). Among the ascolichens, spores are produced in spore-producing structures called ascomata.
  118. The filiform apparatus helps in the entry of pollen tube into a synergid.
  119. E. coli and agrobacterium are found to be very useful in genetic engineering experiments.
  120. Green seed colour is recessive in pea plant. Round seed shape, axial flower position and green colour of pod are dominant traits in pea plant.
  121. Nucleic acid is a polymer of nucleotides. Nucleotides are made up of nitrogen base, sugar and phosphate. On hydrolysis nucleic acid yields nitrogenous base sugar and phosphate.
  122. Mitochondria and chloroplast both have their own DNA and ribosomes and are self-replicating. Both have a double membrane.
  123. Blackman proposed the law of limiting factor and also proved that photosynthesis is a biphasic process. The first one is photochemical reaction or light reaction and the second one is biochemical reaction or dark reaction.
  124. The most common type of aerobic bioreactor in use today is the Steel tank reactor, which may feature a specific internal configuration designed to provide a specific circulation pattern. The stirred tank bioreactor has been designed for the availability of oxygen through the process
  125. The enzyme complex nitrogenase consists of two subunits. I) Fe- protein or nitrogen reductase and II) Mo Fe- protein or nitrogen reductase.
- it is found in prokaryotes only and functions under anaerobic conditions
126. Bryophytes are the plants which produce spores and embryo but no vascular tissues are present. Although the primitive type of conducting tissues are present in the form of hydrome and leptome.
  127. Plant A is a short day plant. It is a plant that flowers only after being exposed to light periods shorter than a certain critical length. And plant B is a long day plant, it flowers only after being exposed to light periods longer than a certain critical length.
  128. A large number of vascular bundles are arranged in a ring. Ring arrangement of vascular bundles is a characteristic of dicot stem (eustele). Each vascular bundle is conjoint open and with endarch protoxylem.
  129. Hill's reaction or photochemical reaction or light reaction is initiated when specific light is absorbed by a group of chlorophyll molecules primarily concerned with light harvesting.
  130. In pea and bean flowers there are five petals. The largest Petal (vexillum) overlaps the two lateral petals (wings) which in turn overlap the two smallest anterior petals (keel). This type of aestivation is known as vexillary aestivation or papilionaceous aestivation
  131. Cyanophyceean granules glycogen granules are inclusion bodies found in cytoplasm of bacteria. These are not bound by any membrane system and are free in the cytoplasm.
  132. repressor is a gene that forms a biochemical for suppressing the activity of operator gene. The promoter is the gene that provides the point of attachment to RNA polymerase required for transcription of structural genes.
  133. taxonomy is important to be able to distinguish different organisms from each other.
  134. In Rhizopus the mycelium is aseptate and coenocytic.
  135. Many desert plants have a thick cuticle on their leaf surfaces and have their stomata arranged in deep pits to minimize water loss. They have CAM pathway that enables their stomata to remain closed during day time.



136. The meristem which occurs between mature tissues is known as intercalary meristem. It occurs in grasses and regenerate parts removed by the grazing herbivores.
137. All are the steps of genetic engineering
138. Apical dominance is due to Auxins
139. The plant body of a liverwort is thalloid. The thallus is dorsiventral and closely appressed to the substratum. Asexual reproduction in liverworts takes place by fragmentation are Gemma cups.
140. Producers are more in number than primary consumers
141. Phyllode is present in Australian acacia. It is a modification of leaf in which lamina is absent and petiole becomes flattened and perform photosynthesis
- 142.



143. underground stems of some plants such as grasses and strawberry Spread new niches and when older parts die new plants are formed.
144. A bract is a modified or specialized leaf especially one associated with a reproductive structure such as a flower, in fluorescence axis, a cone scale. Bracts may be smaller or larger or of a different colour, shape or texture. The flowers may develop in the axis of a bract  
According to many scientists the flower is a modified shoot because of presents of nodes and internodes on it.
145. Since megaspore mother cell forms for microspores after meiosis therefore 64 megaspore mother cells will give rise to 256 microspores.
146. Answer (3)  
Malic acid (4C) → Pyruvate (3C) (in Bundle sheath cell)  
PEP (3C) → Malic acid (Mesophyll)
147. Answer (2)  
During reduction of one NAD<sup>+</sup>, 2 redox equivalents are removed from respiratory substrate.
148. Answer (3)  
Cytokinins help to overcome the apical dominance. Auxins promote it.
149. Answer (4)

- Adenine and guanine are purines.
150. Answer (3)  
During transcription, RNA polymerase binds to promotor region and uses substrate as nucleoside phosphate to polymerise in template dependent manner.
- ZOOLOGY**
151. Saheli is a non- steroidal preparation which do not inhibit ovulation.
152. Snakes and lizards shed off cornified cells during moulting
153. Hyposecretion of cortico steroids of adrenal gland causes disease Addisons disease
154. Fat and cellulose reach the stomach totally undigested
155. The three levels of biodiversity are (1) Genetic (2) Species (3) Ecological
156. T – wave of ECG indicates ventricles repolarization
157. Species with small number but are at risk in future are lower risk species.
158. Emulsification of fats is done by Bile salts.
159. Darwins finches are example of Adaptive radiation
160. In Mongolism (or) Down's syndrome each cell has 47 chromosomes
161. Posterier lobe of pituitary gland is called Neuro hypophysis
162. A and D statements are correct
163. Statement C – Ozone is a secondary pollutant & Statement D – Ozone is measured in Dobson units is correct
164. Follicular cells surround the oocytes and provide nourishment
165. Man has 2 occipetal condytes
166. The frequency of heterozygous individuals is 2 pq
167. ABO blood grouping is an example for multiple allelism
168. Intrinsic rate of natural increase  $r = b - d$   
i.e =  $100 - 10 = 90$
169. Human insulin (Humulin) is commercially produced using genetically engineered bacteria.
170. In a neuro muscular junction , the motor nerve endings secrete acetyl choline
171. The excretory organells in amoeba are contractile vacuoles
172. Peripatus is the connecting link between Annelida and Arthropoda
173. Caffeine , amphetamine and cocaine are nerve stimulants
174. ADH synthesized by Hypothalamus

- Released by Neurohypophysis and acts on DCT and collecting duct.
175. Only myelin sheath is discontinuous at nodes of Ranvier
  176. HIV acts on TH cells and hence their number decreases
  177. In Klinefelter's syndrome males are sterile
  178. Residual volume (1100-1200ml) is greater than tidal volume (500 ml)
  179. Ovulation is under the control of LH
  180. Lake with more domestic sewage causes increased BOD and hence fish will die due to lack of oxygen .
  181. Contraction of diaphragm increases thoracic cavity on antero posterior axis
  182. Typhoid and pneumonia are bacterial diseases
  183. Husband B group wife "O" group cannot have a child with "A" group.
  184. All cyclastomes are not ectoparasites on fishes
  185. (i) Neutrophils - Granulocytic phagocytes  
(ii) Monocytes - Agranulocytic phagocytes  
(iii) Basophils - Secrete histamines  
(iv) Eosinophils - Associated with allergic reactions  
(v) Lymphocytes - Responsible for immune response
  186. India's population was approximately 350 millions at the time of independence
  187. Nervous tissue is derived from Ectoderm
  188. The fatty acids and glycerol first incorporated into small droplets called micelles which move into the intestinal mucosa. They are reformed into chylomicrons which are transported into the lacteals in the villi.
  189. Sertoli cells provide nutrition to the spermatozoa and also produce a hormone called Inhibin, which inhibits the secretion of FSH
  190. Insufficient blood supply to the heart muscles causes coronary heart diseases
  191. A : Catalytic converter is a device incorporated in the exhaust system of a motor vehicle, containing a catalyst for converting pollutant gases into less harmful ones. As the exhaust passes through the converter, unburnt hydrocarbons are converted into carbon dioxide, water,

carbon monoxide and nitric oxide are changed to carbon dioxide and nitrogen gas respectively.

B : Electrostatic precipitator is a device that removes suspended dust particles from a gas or exhaust by applying a high-voltage electrostatic charge and collect the particles on charged plates.

C : Earmuffs is a pair of soft fabric coverings, connected by a band across the top of the head, that are worn over the ears to protect them from cold or high noise level.

D : Land - fill is a site for the disposal of solid waste in which refuse is buried between layers of dirt so as to fill in or reclaim low-lying ground.

192. The given figure shows the maturation of pro- insulin into insulin. The parts marked as A, B, C and D are respectively pro-insulin, cell peptidases, insulin and free C- peptide.

193. The Abingdon tortoise in Galapagos Island became extinct within a decade after goats were introduced on the islands, apparently due to the greater browsing efficiency of the goats. The whole incidence shows the process of competition among the species.

194. A - III, B - V, C - I, D - II, E - IV

195. Interferon is a protein released usually in response to the entry of a virus. It has the property of inhibiting virus replication. Interferon prevents the virus from reproducing within the infected cells and can also induce resistance to the virus in other cells.

- 196 Bats are mammals and their most unique character is presence of mammary glands. Birds are oviparous.

- 197 GIFT : Transfer of an ovum from the donor female into the fallopian tube of another female, who cannot produce ova but can provide a suitable environment for fertilisation and further development.

- 198 Chromosome component in the person affected from Klinefelter's syndrome will be 44 + XXY.

- 199 Marasmus occurs due to simultaneous deficiency of proteins and calories.

- 200 Pepsin is present in stomach and trypsin and chymotrypsin will work in small intestine