# NEET Like MOCK TEST-05

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

## ANSWERS AND SOLUTIONS

### PHYSICS

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

### CHEMISTRY

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

### BOTANY

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

### ZOOLOGY

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

## SOLUTIONS

1. Ans(2)

$$V_{avg} = \frac{\int V dt}{\int dt} = \frac{\int_0^2 (2t+1)\,dt}{\int_0^2 dt} = 3\,m/s$$

2. Ans (4)

Time constant $\tau$ = [T] and Viscosity $\eta$ = $[ML^{-1}T^{-1}]$

For options (1), (2) and (3) dimensions are not matching with time constant.

3. $v = \frac{u}{\sqrt{3}} \Rightarrow 3v^2 = u^2$

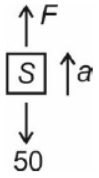
$$\Rightarrow 3\left(v_y^2 + v_x^2\right) = u^2 = 10^2 = 100 \Rightarrow \left(5\sqrt{3} - 10t\right)^2 = \frac{100}{3} - 25$$

$$\Rightarrow \left(5\sqrt{3} - 10t\right)^2 = \frac{25}{3} \Rightarrow 5\sqrt{3} - 10t = \frac{5}{\sqrt{3}} \quad ; \quad t = \frac{1}{\sqrt{3}}s$$

4. $a = \frac{Mg\sin 37^0 + 50\cos 37^0}{M}$

$$a=\frac{(100)\left(\frac{3}{5}\right)+50\left(\frac{4}{5}\right)}{10}\ ;\quad a=10m/s^2$$

5. Tension in the string is $F\left(\frac{F-50}{5}\right)=a$ --------(1)




$$\therefore \frac{1}{2}\times 5\times v^2=5J$$

$$\Rightarrow v=\sqrt{2}\,m/s$$

$$\therefore \sqrt{2}=u+at\ ;\ a=\sqrt{2}$$

$$\left(\frac{F-50}{5}\right)=\sqrt{2}$$

$$F=50+5\sqrt{2}=57.07N$$

6. Ans (2)

Mass of each ball, $m$=50$g$=0.05 $kg$

Initial velocity, $v_1$=5 $m/s$

Initial Momentum, $P_1$=$mv_1$=0.05×5=0.25$kg\ m/s$

After collision, the direction of velocity of each ball is reversed on rebounding.

Final momentum, $P_2$=$m$×(−$v_1$)=0.05×(−5)=−0.25$kg\ m/s$

Impulse imparted on each ball = Change in momentum of each ball after collision

$J$=$P_1$−$P_2$=0.25−(−0.25)=0.5$kg\ m/s$

∴ Impulse imparted due to one ball after collision on another is equal to 0.5$kg\ m/s$

7. Ans (2)

$$U_P=\frac{4}{3}\pi\frac{D^3}{8}\times\frac{D}{2}g$$

$$U_Q=D^3\frac{D}{2}g$$

$$U_R=\frac{\pi}{3}\frac{D^2}{4}.\frac{D}{4}.g$$

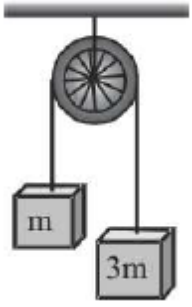
$$U_S=\frac{\pi D^2}{4}.D.\frac{D}{4}.g$$

8. $\because E=K+U$

$$5=K-3\Rightarrow K=8J$$

9. Ans (1)

$$a=\frac{3m-m}{3m+m}g=\frac{g}{2}$$




$$\vec{a}_{cm}=\frac{3m\vec{a}_1-m\vec{a}_2}{3m+m}$$

Both mass have same magnitude of acceleration but in opposite direction $\vec{a}_1=-\vec{a}_2=a$ Let)

$$a_{cm} = \left(\frac{3m-m}{4m}\right) \times \frac{g}{2} = \frac{g}{4}$$

10. Ans (1)

$$K = \frac{J^2}{2I}$$

$$J = \sqrt{2IK}$$

$$J' = \sqrt{2I \times 4K} = 2J$$

$$\therefore \frac{\Delta J}{J} \times 100 = \frac{2J - J}{J} \times 100 = 100\%$$

11. Applying conservation of angular momentum about hing '*O*'

$$\frac{m}{2}\frac{vl}{2} == \left(\frac{m}{2} \times \frac{l^2}{4} + \frac{ml^2}{3}\right)\omega$$

$$\frac{mvl}{4} = \frac{11}{24} ml^2\omega \Rightarrow \omega = \frac{6v}{11l}$$

12. $\tan 30^o = \dfrac{\tan\delta}{\cos\alpha}$

$\sqrt{3}\tan\delta = \cos\alpha$ -------(1)

$$\tan 45^o = \frac{\tan\delta}{\cos(90+\alpha)}$$

$$= \frac{\tan\delta}{-\sin\alpha} \Rightarrow \sin\alpha = -\tan\delta \text{ -------(2)}$$

$(1)^2$ and $(2)^2$ gives

$$1 = \left[\left(\sqrt{3}\right)^2 + 1^2\right]\tan^2\delta$$

$$\tan\delta = \frac{1}{2} \; ; \; \delta = \tan^{-1}\left(\frac{1}{2}\right)$$

13. $x_0 = \dfrac{mg}{K} = \dfrac{GMm}{KR^2}$

At height R = 1600 km

$$x = \frac{GMm}{K(R+h)^2}$$

$$\therefore \frac{x_0}{x} = \frac{(R+h)^2}{R^2} = \left(1 + \frac{h}{R}\right)^2$$

$$= \left(1 + \frac{1600}{6400}\right)^2 \Rightarrow x = \frac{16x_0}{25}$$

14. Before closing down the switch current in the circuit is $I_0 = \dfrac{10}{10} = 1A$

At $t = 0$, when *S* is closed, current in the circuit decays with time to make continuity of the current $\tau = \dfrac{L}{R} = 0.1s$

Now from faraday's law $i = \dfrac{1}{R}\dfrac{d\phi}{dt}$

$$\Rightarrow R\int_0^{\tau} idt = \int_0^{\Delta\phi} d\phi = \Delta\phi$$

$$\Rightarrow 10\int_0^{\tau} I_0 e^{-t/\tau} dt = \Delta\phi$$

$$= \frac{10 \times 1}{-1/\tau}\left[e^{-t/\tau}\right]_0^{\tau} = \Delta\phi$$

$$\Rightarrow 1\left[1 - e^{-1}\right] = \Delta\phi \Rightarrow \left[\frac{e-1}{e}\right] = \Delta\phi$$

15. In the above question, we have proved that

$x = 2\sqrt{h - H}$

For point Q, $x = 2\sqrt{(H-h)h}$

For point P, $x = 2\sqrt{h^{|}\left(H - h^{|}\right)}$

$\therefore 2\sqrt{h(H-h)} = 2\sqrt{h^{|}\left(H - h^{|}\right)}$

$h(H-h) = h^{|}\left(H - h^{|}\right)$ or $h^{|2} - h^{|}H + h(H-h) = 0$

Solving it, we get $h^{|} = (H-h)$

16. Ans (2)

Convection is a mode of heat transfer by actual motion of matter. If is possible only in fluids. convection can be natural or forced.

17. Ans (1)

$$\frac{PV}{RT} = \text{constant} = n$$

$$\Rightarrow \frac{P_0V_0}{RT} = n_0 = \frac{P_1(V_0+V)}{RT}$$

$$\Rightarrow P_1(V_0) = P_2(V_0+V)$$

$$\Rightarrow \left(\frac{P_0V_0}{V_0+V}\right) \times V_0 = P_2(V_0+V)$$

$$\Rightarrow P_2 = \frac{P_0V_0^2}{(V_0+V)^2}$$

$\therefore$ Number of moles after second stroke is

$$n_2 = \frac{P_2V_0}{RT} = \frac{P_0V_0^3}{(V_0+V)^2RT}$$

18. Ans (4)

Argon is a monoatomic gas so it has only translational energy. So translational, rotational energies are 100%, 0%

19. For adiabatic processes, $PV^{\gamma}$ =constant

When Pressure decrease, Volume has to increase to maintain the above relation.

Even as Volume increases, the increase is volume would be higher when the exponent $\gamma$ has a lower value than when the value of $\gamma$ is higher.

So, when $\gamma$ is higher, for monoatomic it is 1.6, the value of V is smaller compared to the value of V for which $\gamma$ is lower, diatomic it is 1.4

Hence, Plot 1 corresponds to lower $\gamma$-diatomic-$O_2$

Plot 2 corresponds to higher $\gamma$-monoatomic-*He*

20. Ans (2)

$$\frac{P}{\rho} = \frac{RT}{M_w}$$

$$\rho = \frac{PM_w}{RT}$$

$$\rho \propto \frac{P}{T}$$

$$\rho_A = \rho_0 = \frac{P_0}{T_0}$$

$\Rightarrow \rho_B = \frac{3P_0}{2T_0} = \frac{3}{2}\rho_0$

21. $x - B = A \sin\omega t$

$x = B + A \sin\omega t$

22. $600\pi t = \omega t$ ; $\omega = 600\pi$ ; $n = 300Hz$

$0.314x = Kx$; $\therefore K = 0.314$

$K = \frac{2\pi}{\lambda}$; $\lambda = 20\,cm$

$l = p\frac{\lambda}{2} = 3\times\frac{20}{2} = 30cm$

Nodes at 0, $\frac{\lambda}{2}, \lambda, \frac{3\lambda}{2}$ =0, 10cm, 20cm, 30cm

23. $v_N = \sqrt{\frac{\gamma_N RT}{M_N}}$

$= \sqrt{\frac{\frac{7}{5}\times RT}{28}}$

$\gamma_{mix} = \frac{n_1 C_{p_1} + n_2 C_{p_2}}{n_1 C_{v_1} + n_2 C_{v_2}}$

$= \frac{\left(\frac{7}{2}+\frac{5}{2}\right)R}{\left(\frac{5}{2}+\frac{3}{2}\right)R} = \frac{6R}{4R} = \frac{3}{2}$

$M_{\text{mix}} = \frac{M_1 n_1 + M_2 n_2}{n_1 + n_2} = \frac{28n + 4n}{2n} = 16$

$v_{\text{mix}} = \sqrt{\frac{\gamma_{mix} RT}{16}} = \sqrt{\frac{3RT}{2\times 16}}$

$\frac{v_{\text{mix}}}{v_N} = \sqrt{\frac{3RT}{32}\times\frac{28\times 5}{7RT}} = \sqrt{\frac{15}{8}}$

24. $\left|\vec{E}\right| = \left|\frac{\Delta V}{\Delta x}\right|$

$E_1 = \frac{10}{2} = 5\,V/m$, $E_2 = \frac{0}{1} = 0\,V/m$, $E_3 = \frac{15-10}{4-3} = 5\,V/m$

$E_4 = \frac{15}{5-4} = 15\,V/m$

25. Ans (4)

Since the surface densities are equal, hence

$\frac{q_1}{4\pi r^2} = \frac{q_2}{4\pi R^2}$ (where $\theta_1 + \theta_2 = Q$)

Or $\frac{q_1}{r^2} = \frac{q_2}{R^2} = \frac{q_1 + q_2}{r^2 + R^2} = \frac{Q}{r^2 + R^2}$

$\therefore q q_1 = \frac{Q}{r^2 + R^2}\times r_2$

and $q_2 = \frac{Q}{r^2 + R^2}\times R^2$

So, potential at the common centre,

$V = \frac{q_1}{4\pi\varepsilon_0 r} + \frac{q_2}{4\pi\varepsilon_0 R} = \frac{1}{4\pi\varepsilon_0}\left(\frac{q_1}{r} + \frac{q_2}{R}\right)$

$= \frac{1}{4\pi\varepsilon_0}\left(\frac{Q}{R^2+r^2}\times\frac{r^2}{r}+\frac{Q}{R^2+r^2}\times\frac{R^2}{R}\right)$

$= \frac{1}{4\pi\varepsilon_0}\frac{Q(R+r)}{\left(R^2+r^2\right)}$

26. $C_1 = \frac{\varepsilon_0 AK_1}{d-t} = \frac{3\varepsilon_0 AK_1}{2d}$, $C_2 = \frac{\varepsilon_0 AK_2}{d-d/3} = \frac{3\varepsilon_0 AK_2}{2d}$

$C_1V_1 = C_2V_2$; $\frac{3\varepsilon_0 AK_1V_1}{2d} = \frac{3\varepsilon_0 AK_2V_2}{2d} \Rightarrow K_1V_1 = K_2V_2$

$2K_2V_1 = K_2V_2 \Rightarrow V_2 = 2V_1$

27. Ans (1)

Current in loop = 3A

$V_A - V_B = 3 + 2 - (1\Omega)\,(3A)$

$= 2V$

28. Volume = A$l$ = $1\times10^{-6}m^3$

Mass = Density $\times$ Volume

$= 5\times10^3\times10^{-6} = 5\times10^{-3}Kg$

No. atoms = $\frac{Mass}{Atomic\,weight}\times N_A = \frac{5}{60}\times6\times10^{23} = 5\times10^{22}$

No. free electrons per volume = n $= \frac{5\times10^{22}}{10^{-6}} = 5\times10^{28}$

$V_d = \frac{i}{nAe} = \frac{16}{5\times10^{28}\times1.6\times10^{-19}\times10^{-6}} = 2\,mm/\sec$

29. $P_s = P_1 = \frac{P_1P_2}{P_1+P_2} = \frac{40\times60}{100} = 24$

$P_p = P_2 = 40+60 = 100W$

$\frac{P_1}{P_2} = \frac{24}{100} = 0.24$

30. Ans (3)

The magnetic field due to wire D at wire C is:

$B_D = \left(\frac{\mu_0}{4\pi}\right) = \frac{2I}{r} = \frac{10^{-7}\times2\times30}{0.03} = 2\times10^{-4}T$

which is directed into the page.

The magnetic field due to wire G at C is,

$B_G = \frac{10^{-7}\times2\times20}{0.02} = 2\times10^{-4}T$

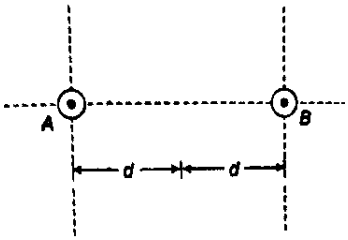
which is directed out of page. Therefore, the field at the position of wire C is :

$B = B_D - B_G = 2\times10^{-4} - 2\times10^{-4} = 0$

The force on 25 cm of wire C is:

$F = BIl\sin\theta = 0$

31.




At mid-point of AB, magnetic field is zero. Left of A, magnetic field is in downward direction. Right of B, magnetic field is in upward direction.

32. $\oint \bar{B}.\overline{dl} = \mu_0\left(i_d + i_c\right)$

$i_c$ = conduction current , $i_d$ = displacement current; $\therefore$ both ac and dc

33. Ans (2)

The magnitude of induced e.m.f. is directly proportional to the rate of change of magnetic flux. Induced charge doesn't depend upon time.

34. Ans (3)

Wattless current = $I_{rms}\sin\phi$

$\sqrt{3} = 2\sin\phi$

$\Rightarrow \phi = 60°$

P.F. = $\cos\phi = \frac{1}{2}$

35. Ans (1)

$P_1 = 2P_L + P_M$

$= 2(n-1)\left(\frac{1}{R} - \frac{1}{\infty}\right) + 0$

$= \frac{2(n-1)}{R}$

$P_2 = 2P_L + P_M$

$= 2(n-1)\left(\frac{1}{\infty} - \frac{1}{-R}\right) + \frac{2}{R}$

$= \frac{2n}{R}$

$\Rightarrow \frac{f_1}{f_2} = \frac{P_2}{P_1} = \frac{n}{n-1}$

36. Ans (3)

$\vec{v}_1 = -\vec{v}_0 + 2\vec{v}_m = -0 + 2(10) = 20\,\text{cm/s}$

37. $(\Delta x)_{max\,3} = 3\lambda$ ; $(\Delta x)_{min\,3} = \frac{(2\times 3-1)\lambda}{2\times\mu} = \frac{5\times 3}{2\times 4}\lambda$

$\Rightarrow \frac{(\Delta x)_{max\,3}}{(\Delta x)_{min\,3}} = \frac{3\lambda}{\frac{15}{8}\lambda} = \frac{8}{5}$

38. 


$I_1 = \frac{I_0}{2}$ from malus law

$I_2 = I_1 \cos^2\theta = \frac{I_0}{2} \times \cos^2 45^o = \frac{I_0}{4}$

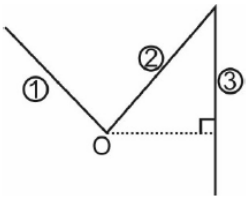
$I_3 = \frac{I_0}{4}\cos^2 45^o = \frac{I_0}{8}$ ; $I_4 = \frac{I_0}{16}$

$\therefore$ % stopped

$= \frac{\left(I_0 - \frac{I_0}{16}\right)}{I_0} \times 100 = 93.75\%$

39. Rate of disintegration independent of pressure, temperature and chemical reactions

40.




$I_1 = \frac{ml^2}{3}, I_2 = \frac{ml^2}{3}, I_3 = \frac{ml^2}{12} + m(OP)^2$

$= \frac{ml^2}{12} + m\left(\frac{\sqrt{3}}{2}l\right)^2 = \frac{5}{6}ml^2$

$\therefore I = I_1 + I_2 + I_3$

$= \frac{ml^2}{3} + \frac{ml^2}{3} + \frac{5}{6}ml^2 = \frac{3ml^2}{2}$

41. Let ground state energy (in eV) be $E_1$

Then from the given condition

$E_{2n} - E_1 = 204\,eV$

$\frac{E_1}{(2n)^2} - E_1 = 204\,eV$ ----------(i)

$E_{2n} - E_n = 40.8\,eV$

$\frac{E_1}{4n^2} - \frac{E_1}{n^2} = 40.8\,eV$ ---------(ii)

From equation (i) and (ii)

$\frac{1 - \frac{1}{4n^2}}{\frac{3}{4n^2}} = 5 \Rightarrow n = 2$

42. Ans (1)

Energy emitted by the lamp in time t = Pt

where P is the power of the lamp

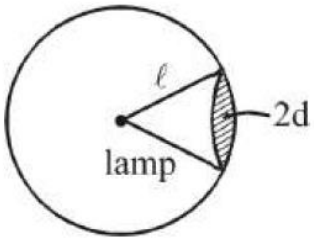
If 2d is radius of the sphere and $\ell$ is the distance of source, then the energy reaching the sphere.

$E = \frac{Pt}{4\pi l^2}\pi(2d)^2$

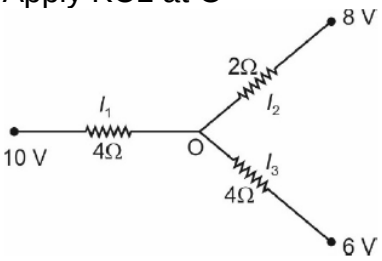
$E = \frac{Ptd^2}{l^2}$

$\frac{nhc}{\lambda} \Rightarrow \frac{Ptd^2}{l^2}$

$n = \frac{Ptd^2}{l^2} \times \frac{\lambda}{hc} \Rightarrow n = \frac{Pt\lambda d^2}{hcl^2}$




43. Apply KCL at O




$$\frac{10-V_0}{4}+\frac{8-V_0}{2}=\frac{V_0-6}{4}$$

Simplifying and solving for $V_0$.

$V_0 = 8V \Rightarrow t_2 = 0A$

44. $I_C = \beta I_B = 100\times 20\times 10^{-6} = 2mA$

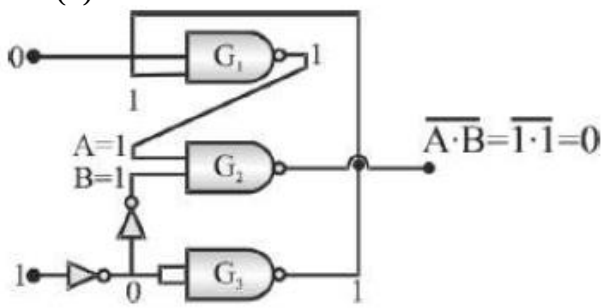
$V_C - 2\times 10^{-3}\times 10^3 = V_{CE}$

$V_{CE} = 5-2 = 3V$

Now, $V_C - 20\times 10^{-6}\times 245\times 10^3 = V_{BE}$

$\Rightarrow 5-4.9 = V_{BE} \Rightarrow V_{BE} = 0.1V$

45. Ans (1)




46. Answer(3)

$$\frac{80-60}{10}=(70-T)K$$

$$\frac{60-40}{15}=(50-(T-5))K$$

$\therefore T = 25^0 C$

47. Answer (2)

$$\frac{(n_1+n_2)R}{\gamma_m-1}=n_1C_V+n_2C_V$$

Or $\frac{0.4+1.2}{\gamma_m-1}=0.4\times\frac{5}{2}+\frac{1.2\times 3}{2}$

$\therefore \gamma_{mix}=\frac{11}{7}$

48. Answer (3)

49. Answer (2)

$\ell_C = 1.25m$

Second overtone of closed organ pipe is its fifth harmonic $n = 5\times\frac{V}{2\ell_C}$

Second harmonic of open organ pipe is

$n^1 = 2 \times \frac{V}{4\ell_0}$ Both unison means same frequency

$\therefore \frac{2 \times V}{2\ell_0} = 5 \times \frac{V}{4\ell_C}$

$\therefore \ell_0 = \frac{4}{5} \times 1.25 = 1.00m$

50. Answer (1)

When both joined by conducting wire both reach at common potential. Then redistribution of charge takes place.

Final charge on first

$q_1^{'} = \frac{C_1}{C_1 + C_2} Q_T$, $q_2^{'} = \frac{C_2}{C_1 + C_2} Q_T$

For sphere: $C_1 = 4\pi\varepsilon_0 R_1$

$C_2 = 4\pi\varepsilon_0 R_2$

$\therefore q_1^{'} = \frac{R_1}{R_1 + R_2} Q_T = \left( \frac{0.1}{0.1 + 0.2} \right) \times (1800) \times 10^{-6}$

$= 600\mu C$

$q_2^{'} = \left( \frac{R_2}{R_1 + R_2} \right) Q_T = 1200\mu C$

From first sphere $300\mu C$ charge flown to bigger sphere

## CHEMISTRY

53. Ans (4)

$W = -P_{ext}\,\Delta V$

$\therefore W = 0$

55. Ans (4)

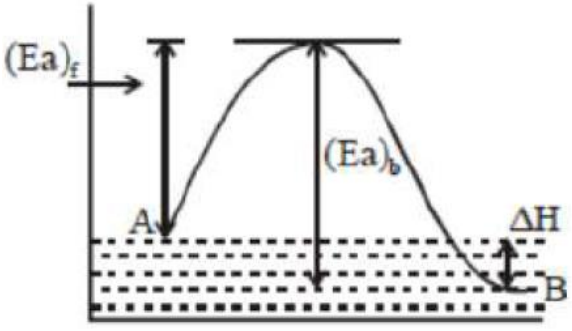
Octahedral void present at the centre of cube and tetrahedral void is present at (1/4)th of the distance along each body diagonal.

$\therefore \frac{\sqrt{3}a}{4}$ = distance between octahedral and tetrahedral void.

56. Ans (4)

$\Delta S$ = –ve, $\Delta H$ = –ve

57. Ans (1)




$\Delta H = (Ea)_f - (Ea)_b$

$-60 = 40 - (Ea)_b$

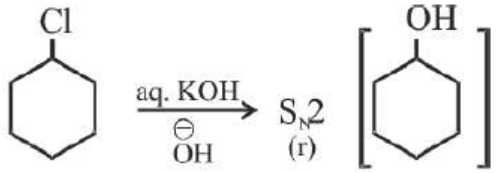
$(E_a)_b = 40 + 60 = 100$ kCal

61. Ans (4); NCERT-XI, Pg No. 126, Para-2

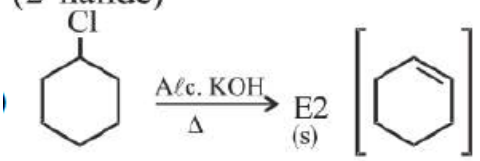
70. Ans (4)

EWG increases reactivity for NAR and EDG decreases reactivity for NAR aldehydes are more reactive than ketones.

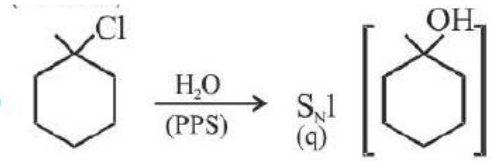
73. Ans (2)

(a) 

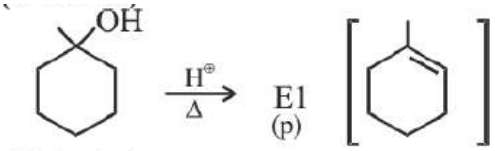

(2°halide)

(b) 


(2°halide)

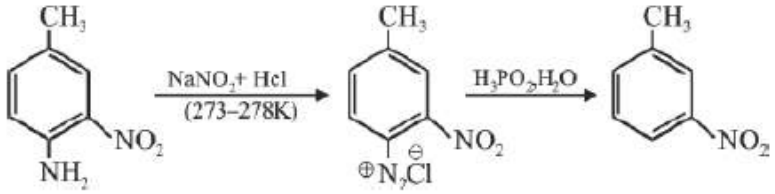
(c) 


(3°halide)

(d) 


3°alcohal

74. Ans (1)



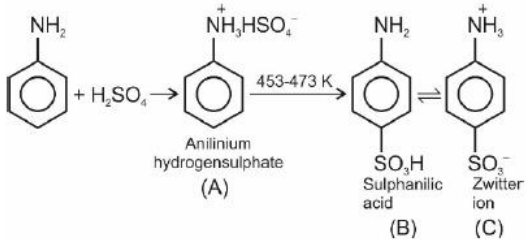

76. 0.2 mol $C_6H_{12}O_6$

$\Rightarrow 0.2 \times 24 = 4.8$ mol of atoms

77. Cu : [29] : $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $3d^{10}$ $4s^1$

$l$ 0 0 1 0 1 2 0

78.



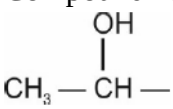

79. $CH_3O - CH(Ph)_2 + HI \xrightarrow{S_N1} CH_3OH + ICH(Ph)_2$

80. $\lambda = \dfrac{h}{mv} = \dfrac{6.62\times10^{-34}}{6.62\times10^{-22}\times1} = 10^{-12} = 0.01\overset{o}{A}$

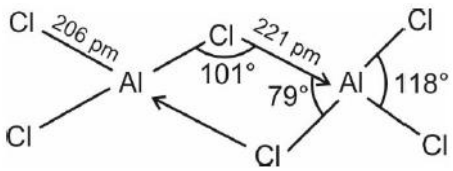
81. Chlorine has highest first negative electron gain enthalpy.

82. Glucose $\xrightarrow{HNO_3}$ saccharic acid

83. Compound having methyl keto group and

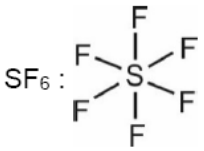



84.




The chloride bridge is a three-centre four-electron bond.

85.



Hybridization of atomic orbitals of sulphur is $sp^3d^2$.

86. Dacron is an example of polyester.

87. Non-polar molecules involve only London forces

88. 0.1N NaOH ⇒ $[OH^-] = 10^{-1}$, pOH = 1, pH = 13

89. $E^o = E^{.o}_{Cr_2O_7^{2-}/Cr^{3+}} - E^o_{Fe^{3+}/Fe^{2+}}$

$= 1.33 - 0.77 = 0.56V$

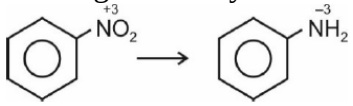
90. Density order : Cs > Rb > Na > K > Li

91. Conceptual

92. Tetra chloroethene was earlier used as solvent for dry cleaning.

93. Packing efficiency of fcc unit cell is 74%

94.



To convert 1 mol nitrobenzene to aniline

= 6 F charge required

To convert 0.2 mol nitrobenzene to aniline, charge required.

= 6 × 0.2 F = 1.2 F

95. $t = \frac{2.303}{k}\log\left(\frac{100}{6.25}\right) = \frac{2.303}{k}\log(16)$

$= \frac{2.303}{k} \times 4\log 2 = \frac{2.303\ 4\log 2}{2.303\log 2} = 4t_{1/2} = 4 \times 3 = 12hr$

$t_{1/2}$

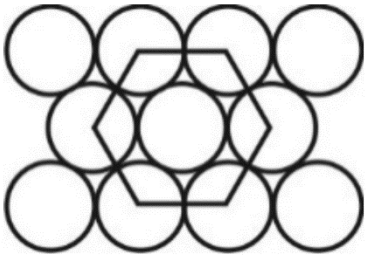
96. Answer (2)

Due to double bond character between C – Cl bond, chlorobenzene does not undergo elimination reaction with alc. KOH.

97. Answer (3)

Classical smog is a mixture of smoke, fog and Sulphur dioxide.

98. Answer (1)



99. Gold sol is negatively charged.

100.

| Metals | Co | Ni | Cu | Zn |
|---|---|---|---|---|
| $E°_{M^{2+}/M}$(V) | –0.28 | –0.25 | +0.34 | –0.76 |

## BOTANY

146 Answer (2)

Hexokinase catalyzes the glucose to glucose-6- phosphate conversion.

147 Answer (2)

PS-I will be functional and cyclic phosphorylation occurs.

148 Answer (3)

Both statements are correct.

149 Answer (3)

Henbane and sugar beet plant are LDPs and require the long days for flowering

150. Answer (1)

Zygote undergoes a period of rest- before germination and forms the thick walled zygospore in sexual life cycle of organism such as algae and fungi

## ZOOLOGY

151. After spermiogenesis the sperm heads become embedded in the Sertoli cells, and are finally released from the seminiferous tubules by the process called spermiation.

152. Mammals from colder climates generally have shorter ears and limbs to minimise heat loss. This is called Allen's rule

153. P-d-ii, Q-a-iv, R-c-i, S-b-iii

154. Rauwolfia vomitorea growing in different Himalayan ranges might be in terms of the potency and concentration of the active chemical (reserpine) that the plant produces

155. Serubber used for removal of $CH_4$ Electrostatic precipitator is used to removal for removal of $SO_2$

156. Itai- itai disease is caused by cadmiuns poisoning

157. For 1year $N_{t+1} = 10 + \left[(100+5) - (80+10)\right]$

$= 10 + \left[(105) - (90)\right]; 10 + 15 = 25$; Only 15 were added every year

158. Cell aggregate type of body plan is shown by porifera

159. Planaria, liverfluke and Taenia are flat worms

160. Circulatory system is open type in Hemichordates

161. Central canal of spinal cord is lined by Ependymal and ciliated Epithelium

162. Starch $\xrightarrow[ph\,6.8]{Salivary\ amylase} Maltose$

163. Mucous helps in lubricating and adhering the masticated food particles into a bolus

164. Matching type

165. Blood colloidal osmotic pressure maintained by Albumins

166. Collecting tubule $\rightarrow$ Ureter $\rightarrow$ Bladder $\rightarrow$ Urethra

167. Uric acid crystals are accumulated in blood due to gout disease

168. Viewing an object near to your eyes, contraction of the ciliary muscles and increase in thickness of lens are required for proper image formation of the retina

169. During implantation the blastocyst becomes embedded in the Endometrium of Uterus

170. Artificial insemination (AI) is the best method for very sperms count in the ejaculate.

171. 1. They evolve through adaptive radiation
2. All varieties of finches which evolved from common ancestor show homology

172. Multi-X Female having double barr-body having problem in menstrual cycle

174. Appearance of dry, scaly lesions on skin, nails and scalp is seen in ring worm

175. Matching type

176. The smooth muscle fibres do not show striations.

177. Compound epithelium is made of more than one layer of cells (multi-layered).
Fibroblasts secrete fibres. Cartilage, bone and blood are various types of specialised connective tissue.

178. In jaundice, bile pigments like bilirubin increases in blood causing yellowness in skin and eyes.

179. The walls of alveoli are damaged due to excessive smoking, loss of elasticity of walls of bronchioles and alveoli. Due to this, the surface area for exchange of gases is reduced. Alveolar sacs remain filled with air even after expiration. The lungs remain inflated as exhalation becomes difficult.

180. Semilunar valves close when ventricular pressure falls. Oxygenated blood is carried by pulmonary vein. First heart sound is produced due to closure of AV valves.

181. ANF opposes the regulation of RAAS. The wall of the atria of the heart releases ANF in response to an increase in blood volume and pressure. ANF causes vasodilation (dilation of blood vessels) and thereby decreases the blood pressure.

182. Sutures are fibrous joints and do not allow any movement.

183. In Myasthenia gravis antibodies recognise the body's acetylcholine receptors as foreign material and start acting against it.

184. Principle structures of corpora quadrigemina are superior colliculi and inferior colliculi.

185. Under unfavourable conditions the *Amoeba* withdraws its pseudopodia and secretes a three layered hard covering or cyst around itself. This phenomenon is termed as encystation.

186. GnRH, a hypothalamic hormone, needed in reproduction, acts on anterior pituitary gland and stimulates secretion of LH and FSH.
187. Chlamydiasis is a sexually transmitted infection which is completely curable
188. *Homo habilis* – 650 to 800 cc
*Homo erectus* – 900 cc
*Cro-magnon man* – 1650 cc
Neanderthal man – 1400 cc
189. Bone marrow and thymus are primary lymphoid organs.
190. A malignant tumor is cancerous and treatment for cancer includes surgery, chemotherapy, immunotherapy and radiotherapy.
191. *Plasmodium falciparum* causes malignant malaria.
192. *Catla*, *Rohu* and *common carp* are examples of freshwater fishes.
193. Once an insect ingest the inactive toxin, it is converted into an active form of toxin due to the alkaline pH of the gut which solubilise the crystals containing a toxic insecticidal protein.
194. In rDNA technique of production of insulin chains A and B are produced separately, extracted and combined by creating disulphide bonds/bridges
195. The disorder is caused due to the deletion of the gene for adenosine deaminase.
196 Answer (3)
Bone marrow and thymus are primary lymphoid organs where origin, maturation and proliferation of lymphocytes will occur. Tonsils are secondary lymphoid organs, they are sites for interaction of lymphocytes with antigen.
197 Answer (4)
The 'Evil Quartet' is responsible for biodiversity loss while ex-situ conservation is a conservation strategy
198 Answer (2)
Rosie produced human protein enriched milk (2.4 gms per litre)
199 Answer (2)
After the entry of sperm, completion of meiosis of oocyte takes place as the sperm donates its centriole to the oocyte.
200 Answer (3)
ERV + TV + IRV = Vital capacity