NEET ANSWER KEY & SOLUTION

PAPER CODE :- FULL TEST-3
FULL SYLLABUS TEST

ANSWER KEY

PHYSICS

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

CHEMISTRY

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

BIOLOGY

101.	(C)	**102.**	(B)	**103.**	(A)	**104.**	(A)	**105.**	(D)	**106.**	(D)	**107.**	(A)
108.	(C)	**109.**	(B)	**110.**	(A)	**111.**	(A)	**112.**	(B)	**113.**	(D)	**114.**	(B)
115.	(C)	**116.**	(A)	**117.**	(A)	**118.**	(A)	**119.**	(B)	**120.**	(A)	**121.**	(B)
122.	(D)	**123.**	(C)	**124.**	(D)	**125.**	(D)	**126.**	(D)	**127.**	(B)	**128.**	(C)
129.	(D)	**130.**	(B)	**131.**	(D)	**132.**	(A)	**133.**	(B)	**134.**	(A)	**135.**	(A)
136.	(B)	**137.**	(A)	**138.**	(C)	**139.**	(B)	**140.**	(B)	**141.**	(A)	**142.**	(C)
143.	(B)	**144.**	(B)	**145.**	(B)	**146.**	(A)	**147.**	(C)	**148.**	(B)	**149.**	(C)
150.	(D)	**151.**	(D)	**152.**	(B)	**153.**	(B)	**154.**	(B)	**155.**	(D)	**156.**	(C)
157.	(B)	**158.**	(C)	**159.**	(B)	**160.**	(B)	**161.**	(A)	**162.**	(A)	**163.**	(A)
164.	(D)	**165.**	(A)	**166.**	(C)	**167.**	(C)	**168.**	(B)	**169.**	(C)	**170.**	(A)
171.	(A)	**172.**	(A)	**173.**	(A)	**174**	(A)	**175.**	(D)	**176.**	(B)	**177.**	(D)
178.	(C)	**179.**	(C)	**180.**	(C)	**181.**	(A)	**182.**	(A)	**183.**	(D)	**184.**	(C)
185.	(B)	**186.**	(C)	**187.**	(B)	**188.**	(A)	**189.**	(D)	**190.**	(B)	**191.**	(C)
192.	(A)	**193.**	(A)	**194.**	(D)	**195.**	(B)	**196.**	(C)	**197.**	(B)	**198.**	(A)
199.	(A)	**200.**	(D)										

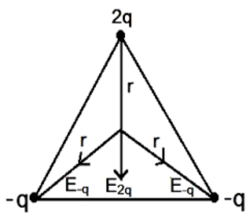
SOLUTIONS

PHYSICS

1. (B)

Sol. Obviously, from charge configuration, at the centre electric field is non-zero. Potential at the due to 2q charge $V_{2q} = \frac{2q}{r}$ and potential due to –q charge

$V_{-q} = \frac{q}{r}$ (r = distance of centre point)



2. (A)

3. (D)

Sol. In stretching of wire $R \propto \frac{1}{d^{2,}}$ where d = Diameter of wire.

4. (A)

Sol. $r = \left(\frac{l_1 - l_2}{l_2}\right) \times R' \Rightarrow r = \left(\frac{55-50}{50}\right) \times 10 = 1\Omega$

5. (B)

Sol. $\frac{\mu_0 I}{4R}$

$\vec{B}_1 = \frac{2\mu_0 I}{4\pi R}$

So, B = $= \frac{2\mu_0 I}{4\pi R}\left(-2\hat{k} - \pi\hat{i}\right)$

6. (C)

Sol. $\vec{F} = q\vec{u} \times \vec{B}$

7. (D)

Sol. $F = \frac{\mu_0}{4\pi}\frac{2i^2}{a}$

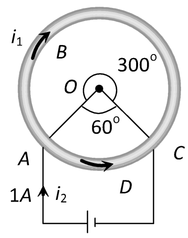
$F_1 = \frac{\mu_0}{4\pi}\frac{2i^2}{x}$ [Attraction]

$F_2 = \frac{\mu_0}{4\pi}\frac{2i \times 2i}{2x} = \frac{\mu_0}{4\pi}\frac{2i^2}{x}$

Thus $F_1 = -F_2$

8. (C)

Sol.



$B = \frac{\mu_0}{4\pi}\frac{\theta i}{r} \Rightarrow B \propto \theta i$ (but $\frac{i_1}{i_2} = \frac{l_2}{l_1} = \frac{\theta_2}{\theta_1}$)

$\Rightarrow \frac{B_1}{B_2} = \frac{\theta_1}{\theta_2} \cdot \frac{i_1}{i_2}$

So, $\frac{B_1}{B_2} = \frac{\theta_1}{\theta_2} \times \frac{\theta_2}{\theta_1}$

$\Rightarrow B_1 = B_2$

9. (C)

10. (A)

Sol. In LCR series circuit, impedence z of the circuit is given by

11. (B)

Sol. $W_0 = \frac{12375}{\lambda_0} = \frac{12375}{5420} = 2.28\text{eV}$

12. (D)

Sol. $E_n = \frac{-13.6}{n^2} = \frac{13.6}{4} = -3.4\,\text{eV}$

13. (B)

14. (B)

Sol. Since diode is in forward bias

$I = \frac{\Delta V}{R} = \frac{4-(-6)}{1 \times 10^3} = \frac{10}{10^3} = 10^{-2}\,\text{A}$

15. (C)

Sol. Here,

Collector current, $I_C = 25\text{mA}$

Base current, $I_B = 1mA$

As $I_B = I_B + I_C = (1 + 25)$ mA = 26Ma

As $\alpha = \frac{I_c}{I_E} = \frac{25mA}{26mA} = \frac{25}{26}$

16. (A)

Sol. The given symbol is of 'AND' gate.

17. (D)

18. (C)

19. (C)

Sol. $I_{max} = \left(\sqrt{I_1} + \sqrt{I_2}\right)^2 = \left(\sqrt{I} + \sqrt{4I}\right)^2 = 9I$

$I_{max} = \left(\sqrt{I_1} - \sqrt{I_2}\right)^2 = \left(\sqrt{I} + \sqrt{4I}\right)^2 = I$

20. (C)

Sol. Width of central bright fringe.

$\frac{2\lambda D}{d} = \frac{2 \times 500 \times 10^{-9} \times 80 \times 10^{-2}}{0.20 \times 10^{-3}} = 4 \times 10^{-3} m = 4mm.$

21. (A)

22. (D)

Sol.

$\left(\vec{A} + \vec{B}\right) \times \left(\vec{A} - \vec{B}\right) = \vec{A} \times \vec{A} - \vec{A} \times \vec{B} + \vec{B} \times \vec{A} - \vec{B} \times \vec{B}$

$= 0 - \vec{A} \times \vec{B} + \vec{B} \times \vec{A} - 0 = \vec{A} \times \vec{B} + \vec{B} \times \vec{A} = 2\left(\vec{B} \times \vec{A}\right).$

23. (A)

Sol. $h = \frac{1}{2} gt^2 = \frac{1}{2} \times 10 \times (4)^2 = 80m$

24. (B)

Sol. $R_{max} = \frac{u^2}{g} = \frac{(20)^2}{10} = 40m.$

25. (A)

26. (C)

Sol. According to law of conservation of liner momentum both pieces should possess equal momentum after explosion. As their masses are equal therefore they will possess equal speed in opposite direction.

27. (A)

Sol. Because in perfectly inelastic collision the colliding bodies stick together and move with common velocity.

28. (B)

Sol. Moment of inertia of a ring of mass M and radius R about an axis passing through the centre and perpendicular to the plane, I= MR^2 ……(i)

Moment of inertia of a ring about its diameter

Idiameter = $\frac{MR^2}{2} = \frac{1}{2}$ [Using (i)]

29. (A)

Sol. $T \propto R^2$, if radius becomes half then time period become $\frac{1}{4}$ of the previous value i.e $\frac{24}{4} = 6$ hr.

30. (D)

Sol. Remains conserved until the torque acting on it remain zero.

31. (A)

Sol. $\frac{v_p}{v_e} = \sqrt{\frac{M_p}{M_e} \times \frac{R_e}{R_p}} = \sqrt{6 \times \frac{1}{2}} = \sqrt{3}$

$\therefore v_p = \sqrt{3} v_e.$

32. (B)

Sol. Potential energy $U = \frac{-GMm}{r} = -\frac{GMm}{R+h}$

$U_{initial} = -\frac{GMm}{3R}$ and $U_{final} = -\frac{-GMm}{2R}$

Loss in PE = gain in $KE = \frac{GMm}{2R} - \frac{GMm}{3R} = \frac{GMm}{6R}$

33. (C)

Sol. Young's modulus of wire depends only on the nature of the material of the wire

34. (D)

Sol. Given A = $0.5 \times 10^6\ mm^2$; V = $200 \times 10^3 mm^2$

$\frac{dV}{dt} = \frac{d(Al)}{dt} = A\frac{dl}{dt} = Au$

$v = \frac{1}{A}\left(\frac{dV}{dt}\right) = \frac{1}{0.5 \times 10^6}\left(200 \times 10^3\right) \Rightarrow v = 4.0\ mms^{-1}$

35. (C)

Sol. A stream lined body has less resistance due to air.

36. (C)

Sol. Let V_0 be the initial volume of glycerine, i.e., at 0ºC (dry). If Vt be its volume at 30ºC.

Then $V_t = V_0(1 + v\Delta t)$

$= V_0(1 + 49 \times 10^{-5} \times 30)$

$V_t = V_0 (1 + 0.01470) = 1.0147070V_0$

$$\Rightarrow \frac{V_0}{V_t} = \frac{1}{1.01470}$$

Let ρ_0 and ρ_t be the initial and final densities of glycerine then initial density, $\rho_0 = \frac{m}{v_0}$ and final density, $\rho_t = \frac{m}{V_t}$

where, m = mass of glycerine

$$\frac{\Delta\rho}{\rho_0} =$$

$$\frac{\rho_t - \rho_0}{\rho_0} = \frac{m\left(\frac{1}{V_t} - \frac{1}{V_0}\right)}{\frac{m}{V_0}} = \left(\frac{V_0}{V_t} - 1\right)$$

$$\Rightarrow \frac{\Delta\rho}{\Delta\rho_0} = \left(\frac{1}{1.01470} - 1\right) = -0.0145$$

Here, negative sign shows that density decreases with rise in temperature.

$$\frac{\Delta\rho}{\rho_0} = 0.0145 = 1.45 \times 10^{-2}$$

$$\Rightarrow \frac{\Delta\rho}{\Delta\rho_0} = 1.5 \times 10^{-2}$$

37. (B)

Sol. $v_{rms} = \sqrt{3RT/M} \Rightarrow \frac{v_1}{v_2} = \sqrt{\frac{M_1}{M_2}}$

38. (B)

Sol. For monoatomic gas $\gamma = \frac{C_p}{C_v} = \frac{5}{3}$

We know that $\Delta Q = \mu C_p \Delta T$ and $\Delta U = \mu C_v \Delta T$

$$\frac{\Delta U}{\Delta Q} = \frac{C_v}{C_p} = \frac{5}{3}$$

e.i. fraction of heat energy to increases the internal energy be $\frac{5}{3}$

39. (B)

Sol. $\lambda_m T = b$ where $b = 2.89 \times 10^{-3} mK$

$$\Rightarrow T = \frac{b}{\lambda_m} = \frac{2.89 \times 10^{-3}}{1.5 \times 10^{-6}} \approx 2000K$$

40. (B)

41. (C)

Sol. Total energy in SHM E = $\frac{1}{2}m\varpi^2 a^2$.

(where a = amplitude)

Kinetic energy K = $\frac{1}{2}m\varpi^2$ $(a^2 - y^2)$ = E– $\frac{1}{2}m\varpi^2 y^2$

When y

$$= \frac{a}{2} \Rightarrow K = E - \frac{1}{2}m\varpi^2\left(\frac{a^2}{4}\right) = E - \frac{E}{4} = \frac{3E}{4}$$

42. (A)

Sol. Here, Amplitude, A = 0.2 m and Time period, T

= 24 s

Since time is noted from the mean position, hence displacement x of a particle from its mean position is given by x = A sin ωt

Here, x = 0.1 m

∴ 0.1 = 0.2 sin ωt

$$\frac{1}{2} \Rightarrow \sin\omega \Rightarrow \sin\frac{\pi}{6} = \sin\omega t \Rightarrow \omega t = \frac{\pi}{6}$$

$$\Rightarrow t = \frac{\pi}{6\omega} = \frac{\pi}{6}\left(\frac{T}{2\pi}\right) \qquad \left[\because \omega = \frac{2\pi}{T}\right]$$

$$= \frac{\pi \times 24}{6 \times 2\pi} = 2s.$$

43. (B)

Sol. Sound waves cannot propagate through vacuum because sound waves are mechanical waves. Light waves can propagate through vacuum because light waves are electromagnetic waves. Since sound waves are longitudinal waves, the particles moves in the direction of propagation, therefore these waves cannot be polarised.

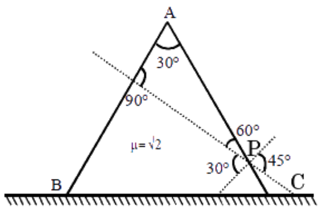
44. (A)

Sol. Real, inverted and same in size because object is at the centre of curvature of the mirror.

45. (D)

Sol. $A = 30°, \mu = \sqrt{2}$ As we know

$A = r_1 + r_2 = 0 + r_2 \Rightarrow A = r_2.$



Applying Snell;s law for the surface AC

$$\frac{1}{\mu} = \frac{\sin r_2}{\sin} = \frac{\sin}{\sin e}$$

$$\Rightarrow \frac{1}{\sqrt{2}} = \frac{\sin 30°}{\sin} \Rightarrow e = 45°$$

$\delta = e - r_2 = 45° - 30° = 15°$

46. (D)

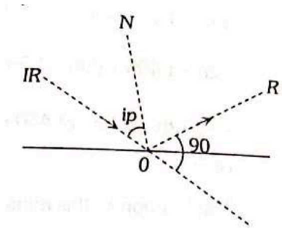
Sol. Distance of the n^{th} bright fringe from the centre

$$x_n = \frac{n\lambda D}{d}$$

$$\Rightarrow x_3 = \frac{3 \times 6000 \times 10^{-10} \times 2.5}{0.5 \times 10^{-3}} = 9 \times 10^{-3} m = 9mm$$

47. (D)

Sol. Required angle = 2× 57.5+90 = 205°



48. (B)

Sol. For same range angle of projection should be θ and 90-θ

So, time of flight $t_1 = \frac{2u\sin\theta}{g}$ and

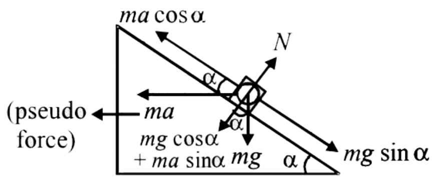
$$t_2 = \frac{2u\sin(90-\theta)}{g} = \frac{2u\cos}{g}$$

By multiplying = $t_1 t_2 = \frac{4u^2 \sin\theta\cos\theta}{g^2}$

$$t_1 t_2 = \frac{2}{g}\frac{\left(u^2 \sin 2\theta\right)}{g} = \frac{2R}{g} \Rightarrow t_1 t_2 \propto R,$$

49. (B)

Sol.



Let the mass of a block is m. It will remains stationary if forces acting on it are in equilibrium i.e, ma sin α = mg sin α ⇒a = gtan α

Here ma = Pseudo force on block, mg = Weight.

50. (D)

51. (C)

Sol. molality

$$= \frac{\text{Molarity}}{\text{density} - \frac{\text{molarity} \times \text{molar mass}}{1000}}$$

Molarity (M) = 2
Density = 1.2 g/cm^3

$$m = \frac{2}{1.2 - \frac{2 \times 40}{1000}} = 1.67$$

52. (B)

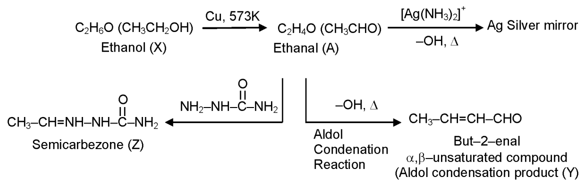
Sol. It is birch reduction

53. (A)

Sol. First reaction is S_N1 reaction because C_2H_5OH used as solvent which is a weak nucleophile.
Second reaction is S_N2 reaction because $C_2H_5O^-$ is strong nucleophile.

54. (C)

Sol.



55. (D)

Sol. After removing cathode no net charge will flow but ions move randomly.

56. (B)

Sol. It is a simple & popular fact.

57. (D)

Sol. $PH_3 \xrightarrow{W} P + \frac{3}{2}H_2$

Rate = k[PH_3].
It is independent of the surface coverage because zero order reaction depend on surface area covered by reactant.

58. (A)

Sol. 0.5 M C_2H_5OH (aq) 0.1 M $Mg_3(PO_4)_2$ (aq)
i = 1 i = 5
effective molarity = 0.5
effective molarity = 0.5 m
0.25 M KBr (aq) 0.125 M Na_3PO_4 (aq)
i = 2 i = 4
effective molarity = 0.5 M
effective molarity = 0.5 M
Hence all colligative properties are same.

Note : This equation is solved by assuming that the examinar has taken $Mg_3(PO_4)_2$ to be completely soluble. However the fact is that it is insoluble (sparingly soluble).

59. (C)

Sol. (A) $Hg^{2+}/H^+,H_2O$ → Addition of H_2O at alkene

(B) Na/liquid NH_3 → Birch reduction (Alkyne → trans alkene)

(C) H_2,Pd/C, quinolone → reduce alkyne → Cis alkene

(D) Zn/HCl → Reduce alkyne → alkyl halide

60. (B)

Sol. Molarity has volume term in its expression and volume is temperature dependent.

61. (A)

Sol. $\frac{1}{2}mv^2 = 0.5$ J

$\frac{1}{2} \times 1 \text{ kg} \times v^2 = 0.5$ J

or $v^2 = 1$ or $v = 1$ ms^{-1}

$$\lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34}\ \text{kgm}^2\text{s}^{-1}}{1\ \text{kg} \times 1\ \text{m s}^{-1}}$$

= 6.626 × 10^{-34} m.

62. (B)

Sol. $_{24}Cr$ → $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^5, 4s^1$

$\ell = 1, \ell = 1, \ell = 2$

(we know for p, ℓ = 1 and for d, ℓ = 2).

For ℓ = 1, total number of electrons = 12

For ℓ = 2, total number of electron = 5.

63. (B)

Sol. Nitrogen has half filled stable configuration, ns^2np^3. So, ionization enthalpy of nitrogen is greater than oxygen. On moving down the group, metallic radius increases due to increase in number of shells.

64. (B)

Sol. In 4-coordinate complex of platinum (Pt^{II}), the four ligands are arranged about the central platinum ion(II) in a square planar geometry (dsp^2) because of higher CFSE of $5d^8$ configuration.

65. (D)

Sol. Lanthanoid contraction is due to ineffective shielding produced by larger f-subshell.

66. (D)

Sol. Gadolinium ($_{64}Gd$) = $[Xe]^{54}\ 4f^7 5d^1 6s^2$

67. (A)

Sol. CO

No of electron in CO = 6 + 8 = 14

(i) CO $\longrightarrow \sigma 1S^2, \overset{*}{\sigma} 1S^2, \sigma\ 2S^2, \overset{*}{\sigma} 2S^2,$

$\left[\pi 2P_x^2 = \pi 2P_y^2\right] \sigma 2P_Z^2$

All electrons are paired so diamagnetic

(ii) $O_2 \longrightarrow \sigma 1S^2, \overset{*}{\sigma} 1S^2, \sigma\ 2S^2, \overset{*}{\sigma} 2S^2,$

$\sigma 2P_Z{}^2 \left[\pi 2P_x^2 = \pi 2P_y^2\right], \left[\pi^* 2P_x^1 = \pi^* 2P_y^1\right]$

Unpaired electron = 2 (Paramagnetic)

(iii) $B_2 \longrightarrow \sigma 1S^2, \overset{*}{\sigma} 1S^2, \sigma 2S^2, \overset{*}{\sigma} 2S^2$

$\left[\pi 2P_x^1 = \pi 2P_y^1\right]$ (Paramagnetic)

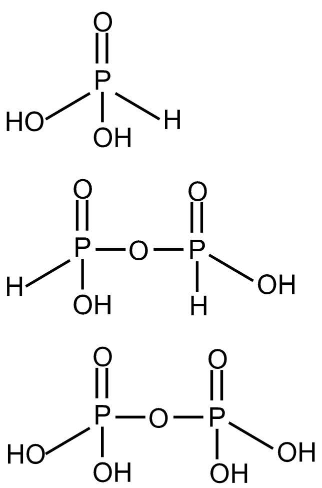
(iv) NO $\longrightarrow \sigma 1S^2, \overset{*}{\sigma} 1S^2, \sigma 2S^2, \overset{*}{\sigma} 2S^2,$

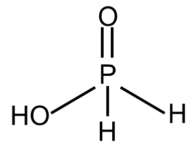
$\sigma 2P_Z{}^2 \left[\pi 2P_x^2 = \pi 2P_y^2\right], \left[\pi^* 2P_x^1 = \pi^* 2P_y^0\right]$

(Paramagnetic)

68. (C)

Sol.





69. (B)

Sol. Covalent nature is judged by Fajan's rule.

70. (C)

Sol. $\Delta S_{sys} = nR\ \ell n \frac{P_1}{P_2} + nC_p \ell n \frac{T_2}{T_1}$

In isothermal process $T_1 = T_2$

$\Delta S_{sys} = nR\ \ell n \frac{P_i}{P_f}$

71. (D)

Sol. $H_3BO_3 + H_2O \rightleftharpoons B(OH)_4^- + H^+$

H_3BO_3 is Lewis acid and accept OH^- from H_2O and releases H^+.

72. (D)

Sol. (A) Configuration of d-block element is [inert gas] $ns^2(n-1)d^{1-10}$.

(B) These element have properties b/w s and p-block.

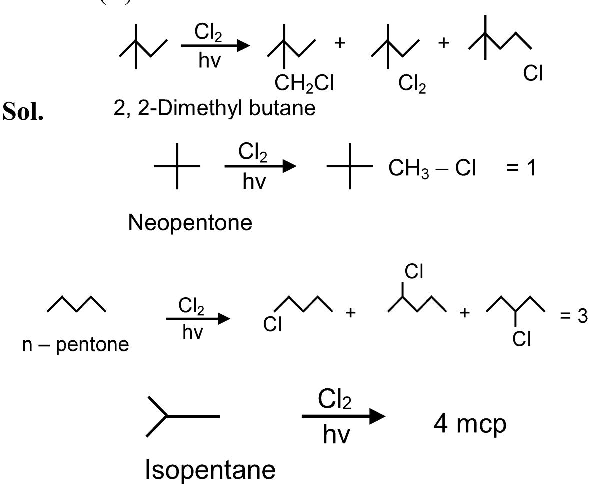
(C) d-block element starts with $Sc_{21} - [Ar]_{18}\ 4s^2\ 3d^1$.

73. (A)

Sol. Cu, Ag, Au group of elements are called coinage metals as these are used in minting coins.

74. (B)

Sol.



75. (D)

Sol. $[Cr(NH_3)_4Cl_2]^+$; let the oxidation state of Cr is x, then x + 4 (–0) + 2 (–1) = +1
So, x = 3

76. (C)

Sol. $KClO_3 + H_2C_2O_4 + H_2SO_4 \longrightarrow K_2SO_4 + KCl + CO_2 + H_2O$
Maximum change in oxidation number is observed in Cl (+5 to –1).

77. (D)

Sol. $[Co(II)(NO_2)\ (NH_3)_5]^{2+} + 2Cl^-$ and now follow IUPAC rules.

78. (C)

Sol. $P_{total} = P^0_A\, x_A + P^0_B\, x_A$
$760 = 520\, x_A + 1000\,(1 - x_A)$
$760 = 520\, x_A + 1000 - 1000\, x_A$
$x_A = 0.5$
mol % = 50%

79. (B)

Sol. With Ammonia derivation carbonyl compounds give addition followed by elimination reaction. Sligtly acidic medium will generate a nucleophilic centre for weak base like ammonia derivatives.

80. (A)

Sol. Salt is of WAWB

$$\sqrt{K_h} = \frac{h}{1-h}$$

$$\sqrt{6.25\times10^{-6}} = \frac{h}{1-h}$$

$$25 \times 10^{-4} = \frac{h}{1-h}$$

$\%h = 25 \times 10^{-2} = 0.25$

81. (D)

Sol. $Cu^+ + e^- \longrightarrow Cu$, $E^\circ = x_1$ Volt
$Cu^{2+} + 2e^- \longrightarrow Cu$, x_2 Volt
$Cu \longrightarrow Cu^+ + e^-$ $-x_1$Volt
$Cu^{2+} + e^- \longrightarrow Cu^+$
$-2 \times x_2 \times f + 1 \times x_1 \times f = -1 \times E^o \times f$
$\mathbf{E^o = 2x_2 - x_1}$

82. (A)

Sol. SCN^- ion can coordinate through the sulphur or nitrogen atom. Such possibilities give rise to linkage isomerism in coordination compounds.

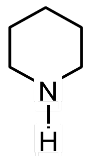
M ← SCN thiocyanato or thiocyanato-S

M ← NCS isothiocyanato or thiocyanato-N

83. (B)

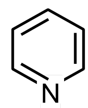
Sol. Anionic hydrolysis give basic solution.

84. (B)



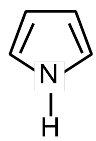
(R)

Sol. In the lone pair is localized in sp^3



(P)

hybrid orbital, in the lone pair is localized in sp^2 hybrid orbital, and in



(Q)

the lone pair electron is delocalized in aromaticity.

85. (B)

Sol. Molality, $m = \frac{M}{1000d - MM_2} \times 1000$
(where M = molarity, d = density, M_2 = molecular mass)

$$m = \frac{2.05}{1000\times1.02 - 2.05\times60} = 2.28 \text{ mol kg}^{-1}$$

86. (B)

Sol. As the size of halogen atom increases, the acidic strength of boron halides increases. Thus, BF_3 is the weakest Lewis acid. This is because of the pπ – pπ back bonding between the fully-filled unutilised 3p orbitals of F and vacant 2p orbitals of boron which makes BF_3 less electron deficient. Such back donation is not possible in case of BCl_3 or BBr_3 due to larger energy difference between their orbitals. Thus, these are more electron deficient. Since on moving down the group the energy difference increases, the Lewis the acid character also increases. Thus, the tendency to behave as Lewis acid follows the order
$BBr_3 > BCl_3 > BF_3$

87. (B)

Sol. Neither of B, or C, nor D, follow the Huckel's rule of $4n + 2\pi e^-$ for aromaticity.

88. (B)

Sol. For $C_xH_yO_zX_aN_b$ Du = $\frac{2x + 2 - y - a + b}{2}$ ∴

for $C_{20}H_{24}N_2O_2$ Du = 10 = 6db + 4 ring.

89. (B)

Sol. $\Delta H = E_{a_f} - E_{a_b} = 0$

90. (A)

Sol. Ribose have five carbon atoms.

91. (A)

Sol. Entropy = measurement of disorderness if $\Delta n_g < 0$ then $\Delta S < 0$

92. (D)

Sol. $CH_3COOH \rightleftharpoons CH_3COO^- + H^+$

$C - 3.4\times10^{-4}$ $\quad 3.4\times10^{-4}$ $\quad 3.4\times10^{-4}$

$K_a = \frac{(3.4\times10^{-4})(3.4\times10^{-2})}{(C - 3.4\times10^{-4})} = 1.7 \times 10^{-5} = 10^{-1}$

$\Rightarrow 10^{-1} C = 6.8 \times 10^{-4}$

$\Rightarrow 10^{-1} C = 6.8 \times 10^{-4}$

$\Rightarrow C = 6.8 \times 10^{-3}$

93. (C)

Sol. M is more reactive than carbon and B is more reaitive than A. Also both B and A are less reactive than C.

94. (D)

Sol. **The 1st order reaction**

$t = \frac{2.303}{k}\log\frac{a}{a-x}$

$= \frac{2.303}{k}\log\frac{100}{100-99}$

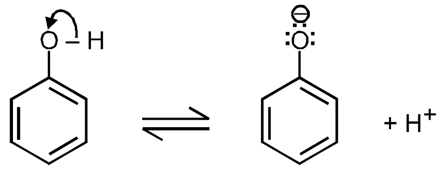
$= \frac{2.303}{k}\log 10^2$

$= \frac{2.303}{k}\times 2\times\log 10$

$\frac{2.303\times 2}{k} = \frac{4.606}{k}$

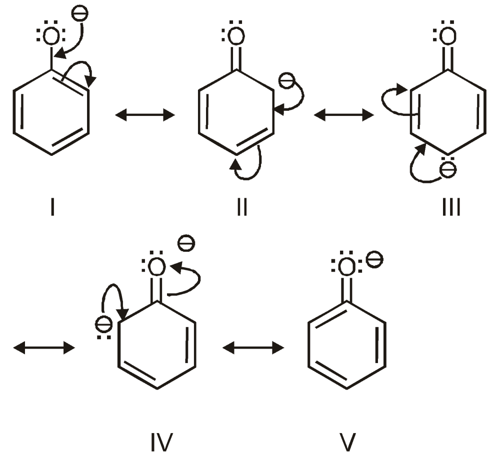
95. (B)

Sol. Phenols are much more acidic than alcohols, due to the stabilisation of phenoxide ion by resonance.



Phenol $\qquad$ Phenoxide ion

Phenoxide ion is stablized due to following resonating structures :



While in alcohols

$R - \ddot{O}{:} - H \rightleftharpoons R - \ddot{O}{:}^- - H^+$

Alcohol $\qquad$ (not stabilized due to absence of resonance)

Ortho nitrophenoles most acidic because in it $-NO_2$ electron attracting group is attached on ortho position which helps in stabilizing of negative charge on the oxygen of phenoxide ion. Hence, due to this reason acidic character of phenol increased, while on attachment of $-CH_3$ group (electron donating group) acidic strength of phenol decreased in cresol due to destabilization of phenoxide ion.

96. (A)

Sol. An acid buffer solution consists of solution of weak acid with strong base of its salt.

97. (C)

Sol. Here: $\Delta T_b = 0.323K$

$w = 0.5143g$ weight of Anthracene.

$W = 35g$ weight of chloroform

$K_b =$ Molal elevation constant

$(3.9\ K - Kg/mol)$

$$m = \frac{K_b \times w \times 1000}{W \times \Delta T_b} = \frac{3.9 \times 0.5143 \times 1000}{0.323 \times 35}$$

$= 177.42 g/mol$

98. (B)

Sol. Decomposes in sunlight.

$$2AgNO_3 \xrightarrow{\Delta} 2Ag + 2NO_2 + O_2$$

99. (C)

Sol. $CH_3CH_2CH_2CH_2NH_2 \xrightarrow[CHCl_3]{KOH(alc.)} CH_3CH_2CH_2CH_2NC + 3\ KCl + 3\ H_2O$

1° Amine Bad smell of isocyanide

$CH_3C \equiv CH$ + Amm. $AgNO_3 \longrightarrow CH_3C \equiv \bar{C}Ag^+ + HNO_3$

White ppt.

$CH_3CH_2COOCH_3 + NaOH \xrightarrow{Heat} CH_3CH_2COONa + CH_3OH$

$$\underset{\text{2° Alcohol}}{CH_3CH(OH)CH_3} + \text{Conc. HCl} \xrightarrow{\text{anhy. } ZnCl_2} \underset{\text{cloudiness appears in 5 minutes}}{CH_3-CH(Cl)-CH_3} + H_2O$$

100. (B)

Sol. Clemmenson reduction is

$$>C=O \xrightarrow{Zn-Hg/HCl} >CH_2$$