NEET(UG)–2018 TEST PAPER WITH ANSWER & SOLUTION (HELD ON SUNDAY 06th MAY, 2018)

CHEMISTRY

46. A mixture of 2.3 g formic acid and 4.5 g oxalic acid is treated with conc. H_2SO_4. The evolved gaseous mixture is passed through KOH pellets. Weight (in g) of the remaining product at STP will be

(1) 1.4 (2) 3.0 (3) 2.8 (4) 4.4

Ans. (3)

Sol.

$$HCOOH \xrightarrow[\text{Dehydrating Agent}]{H_2SO_4} CO + H_2O \left(\begin{matrix}H_2O \text{ abosrbed} \\ \text{by } H_2SO_4\end{matrix}\right)$$

$(\text{moles})_i = \frac{2.3}{46} = \frac{1}{20}$ 0 0

$(\text{moles})_f$ 0 $\frac{1}{20}$ $\frac{1}{20}$

$$H_2C_2O_4 \xrightarrow{H_2SO_4} CO + CO_2 + H_2O$$

[H_2O absorbed by H_2SO_4]

$(\text{moles})_i$ $\frac{4.5}{90} = \frac{1}{20}$ 0 0 0

$(\text{moles})_f$ 0 $\frac{1}{20}$ $\frac{1}{20}$ $\frac{1}{20}$

CO_2 is absorbed by KOH.

So the remaning product is only CO.

moles of CO formed from both reactions

$$= \frac{1}{20} + \frac{1}{20} = \frac{1}{10}$$

Left mass of CO = moles × molar mass

$$= \frac{1}{10} \times 28$$

$$= \boxed{2.8\ g} \text{ Ans.}$$

47. Nitration of aniline in strong acidic medium also gives m-nitroaniline because

(1) In spite of substituents nitro group always goes to only m-position.

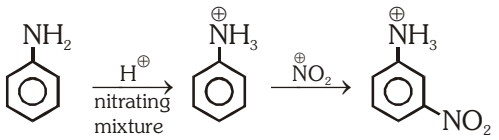
(2) In electrophilic substitution reactions amino group is meta directive.

(3) In absence of substituents nitro group always goes to m-position

(4) In acidic (strong) medium aniline is present as anilinium ion.

Ans. (4)

Sol.



In acidic medium aniline is protonated to form anilinium ion which is metadirecting.

48. Which of the following oxides is most acidic in nature?

(1) MgO (2) BeO

(3) BaO (4) CaO

Ans. (2)

Sol. In metals moving down the group metallic character increases, so basic nature increases hence most acidic will be BeO.

49. The difference between amylose and amylopectin is

(1) Amylopectin have 1 → 4 α-linkage and 1→ 6 α-linkage

(2) Amylose have 1 → 4 α-linkage and 1→ 6 β-linkage

(3) Amylopectin have 1 → 4 α-linkage and 1→ 6 β-linkage

(4) Amylose is made up of glucose and galactose

Ans. (1)

Sol.

Amylose is long unbranched chain with α-D-Glucose with held by C_1–C_4 glucosidic linkage whereas amylopectin is branched chain polymer of α-D glucose unit in which chain is formed by C_1–C_4 glycosidic linkage while branching occurs by C_1–C_6 glucosidic linkage.

50. Regarding cross-linked or network polymers, which of the following statements is ***incorrect?***

(1) They contain covalent bonds between various linear polymer chains.

(2) They are formed from bi-and tri-functional monomers.

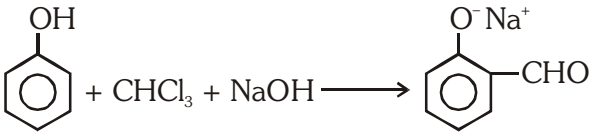
(3) Examples are bakelite and melamine.

(4) They contain strong covalent bonds in their polymer chains.

Ans. (4)

Sol. Cross-linked or network polymers are usually formed from bi-functional & tri-functional monomers and contains strong covalent bond between various linear polymer chains like Melamine, Bakelite etc.

51. In the reaction



the electrophile involved is

(1) dichloromethyl cation $(\overset{\oplus}{C}HCl_2)$

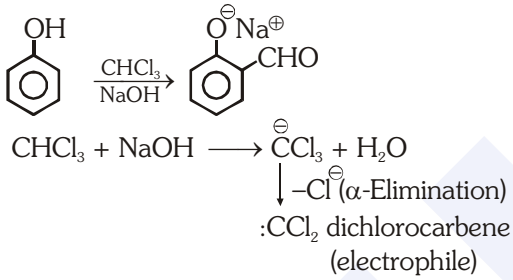
(2) formyl cation $(\overset{\oplus}{C}HO)$

(3) dichloromethyl anion $(\overset{\ominus}{C}HCl_2)$

(4) dichlorocarbene $(:CCl_2)$

Ans. (4)

Sol.



52. Carboxylic acid have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular mass. It is due to their

(1) formation of intramolecular H-bonding

(2) formation of carboxylate ion

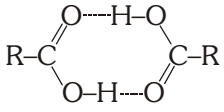
(3) more extensive association of carboxylic acid via van der Waals force of attraction

(4) formation of intermolecular H-bonding.

Ans. (4)

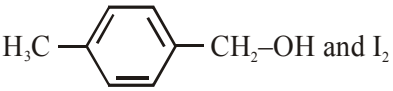
Sol. Carboxylic acid has higher boiling point than aldehyde, ketone and even alcohols of comparable molecular mass.

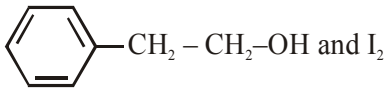
This is due to more extensive association through intermolecular H-bonding.

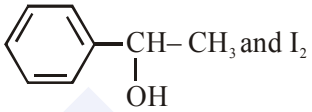


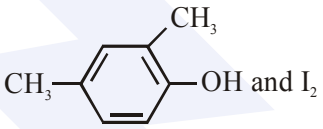
53. Compound A, $C_8H_{10}O$, is found to react with NaOI (produced by reacting Y with NaOH) and yields a yellow precipitate with characteristic smell.

A and Y are respectively

(1) 

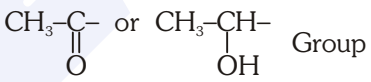
(2) 

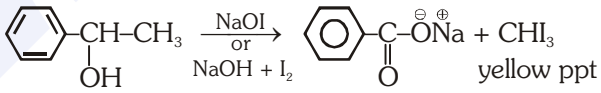
(3) 

(4) 

Ans. (3)

Sol. Haloform reaction is shown by compound having





54. The correct difference between first- and second-order reaction is that

(1) the rate of a first-order reaction does not depend on reactant concentration; the rate of a second-order reaction does depend on reactant concentrations.

(2) the half-life of a first-order reaction does not depend on $[A]_0$; the half-life of a second-order reaction does depend on $[A]_0$

(3) a first-order reaction can be catalyzed; a second-order reaction cannot be catalyzed.

(4) the rate of a first-order reaction does depend on reactant concentrations; the rate of a second-order reaction does not depend on reactant concentrations

Ans. (2)

Sol. $(t_{1/2})1^{st}$ order = Independent of Concentration

$(t_{1/2})2^{nd}$ order $\propto \frac{1}{[A]_0}$

55. Among CaH_2, BeH_2, BaH_2, the order of ionic character is

(1) $BeH_2 < CaH_2 < BaH_2$

(2) $CaH_2 < BeH_2 < BaH_2$

(3) $BeH_2 < BaH_2 < CaH_2$

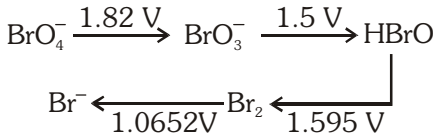
(4) $BaH_2 < BeH_2 < CaH_2$

Ans. (1)

Sol. $BeH_2 < CaH_2 < BaH_2$

Smaller the size of cation, more will be its polarising power. Hence BeH_2 will be least ionic.

56. Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below:



Then the species undergoing disproportionation is:-

(1) BrO_3^- (2) BrO_4^-

(3) Br_2 (4) HBrO

Ans. (4)

Sol. Calculate E°_{cell} corresponding to each compound under going disproportionation reaction. The reaction for which E°_{cell} comes out +ve is spontaneous.

$HBrO \longrightarrow Br_2$ $E^\circ = 1.595$, SRP (cathode)

$HBrO \longrightarrow BrO_3^-$ $E^\circ = -1.5V$, SOP (Anode)

$2HBrO \longrightarrow Br_2 + BrO_3^-$

E°_{cell} = SRP (cathode) – SRP (Anode)

= 1.595 – 1.5

= 0.095 V

$E^\circ_{cell} > 0 \Rightarrow \Delta G^\circ < 0$ [spontaneous]

57. In which case is the number of molecules of water maximum?

(1) 18 mL of water

(2) 0.18 g of water

(3) 0.00224 L of water vapours at 1 atm and 273 K

(4) 10^{-3} mol of water

Ans. (1)

Sol. (1) 18 mL water

As d_{H_2O} = 1 g/mL So W_{H_2O} = 18g

$$n_{H_2O} = \frac{18}{18} = 1$$

molecules = $1 \times N_A$

(2) 0.18 g of water

$$n_{H_2O} = \frac{0.18}{18} = 0.01$$

$(molecules)_{H_2O} = 0.01 \times N_A$

(3) $(V_{H_2O(g)})_{STP}$ = 0.00224 L

$$n_{H_2O} = \frac{V}{22.4} = \frac{0.00224}{22.4} = 0.0001$$

molecules = $0.0001 \times N_A$

(4) $n_{H_2O} = 10^{-3}$

$(molecules)_{H_2O} = 10^{-3} \times N_A$

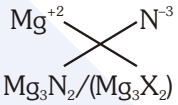
58. Magnesium reacts with an element (X) to form an ionic compound. If the ground state electronic configuration of (X) is $1s^2\ 2s^2\ 2p^3$, the simplest formula for this compound is

(1) Mg_2X_3 (2) MgX_2 (3) Mg_2X (4) Mg_3X_2

Ans. (4)

Sol. Magnesium ion = Mg^{+2}

X = Nitrogen Nitrogen ion = N^{-3}



59. Iron exhibits bcc structure at room temperature. Above 900°C, it transforms to fcc structure. The ratio of density of iron at room temperature to that at 900°C (assuming molar mass and atomic radii of iron remains constant with temperature) is

(1) $\frac{\sqrt{3}}{\sqrt{2}}$ (2) $\frac{4\sqrt{3}}{3\sqrt{2}}$ (3) $\frac{3\sqrt{3}}{4\sqrt{2}}$ (4) $\frac{1}{2}$

Ans. (3)

Sol. BCC FCC

$4r = \sqrt{3}a$ $4r = \sqrt{2}a$

$a = \frac{4r}{\sqrt{3}}$ $a = \frac{4r}{\sqrt{2}}$

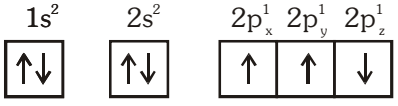
$$\frac{d_{BCC}}{d_{FCC}} = \frac{\frac{Z_{BCC} \times M}{N_A\ a^3}}{\frac{Z_{FCC} \times M}{N_A\ a^3}} = \frac{\frac{2 \times M}{N_A\left(\frac{4r}{\sqrt{3}}\right)^3}}{\frac{4 \times M}{N_A \times \left(\frac{4r}{\sqrt{2}}\right)^3}} = \frac{3}{4}\sqrt{\frac{3}{2}}$$

60. Which one is a **wrong** statement ?

(1) Total orbital angular momentum of electron in 's' orbital is equal to zero

(2) An orbital is designated by three quantum numbers while an electron in an atom is designated by four quantum numbers.

(3) The electronic configuration of N atom is



(4) The value of m for d_{z^2} is zero

Ans. (3)

Sol. The correct configuration of 'N' is

61. Consider the following species:

CN^+, CN^-, NO and CN

Which one of these will have the highest bond order?

(1) NO (2) CN^-

(3) CN^+ (4) CN

Ans. **(2)**

Sol.

Ion/Species	Total electron	Bond order
NO	15	2.5
CN^-	14	3
CN^+	12	2
CN	13	2.5

62. Which of the following statements is **not** true for halogens ?

(1) All form monobasic oxyacids.

(2) All are oxidizing agents.

(3) All but fluorine show positive oxidation states.

(4) Chlorine has the highest electron-gain enthalpy.

Ans. **(Bonus)**

63. Which one of the following elements is unable to form MF_6^{3-} ion ?

(1) Ga (2) Al (3) B (4) In

Ans. **(3)**

Sol. MF_6^{-3}

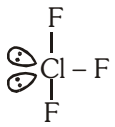
Boron belongs to 2nd period and it does not have vacant d-orbital.

64. In the structure of ClF_3, the number of lone pairs of electrons on central atom 'Cl' is

(1) one (2) two (3) four (4) three

Ans. **(2)**

Sol.



2 lone pair at equitorial position.

65. Considering Ellingham diagram, which of the following metals can be used to reduce alumina ?

(1) Fe (2) Zn (3) Mg (4) Cu

Ans. **(3)**

Sol. Mg has more $-\Delta G$ value then alumina. So it will be in the lower part of Ellingham diagram. Metals which has more $-\Delta G$ value can reduce those metals oxide which has less $-\Delta G$ value.

66. The correct order of atomic radii in group 13 elements is

(1) B < Al < In < Ga < Tl

(2) B < Al < Ga < In < Tl

(3) B < Ga < Al < Tl < In

(4) B < Ga < Al < In < Tl

Ans. **(4)**

Sol. In group 13 due to transition contraction [Al > Ga]

67. The correct order of N-compounds in its decreasing order of oxidation states is

(1) HNO_3, NO, N_2, NH_4Cl

(2) HNO_3, NO, NH_4Cl, N_2

(3) HNO_3, NH_4Cl, NO, N_2

(4) NH_4Cl, N_2, NO, HNO_3

Ans. **(1)**

Sol. $\overset{+5}{HNO_3}$, $\overset{+2}{NO}$, $\overset{0}{N_2}$, $\overset{-3}{NH_4Cl}$

68. On which of the following properties does coagulating power of an ion depend ?

(1) The magnitude of the charge on the alone

(2) Size of the ion alone

(3) Both magnitude and sign of the charge the ion

(4) The sign of charge on the ion alone

Ans. **(3)**

Sol. According to Hardy Schulze rule : The coagulating power of an ion depend on both magnitude and sign of the charge of the ion.

69. Following solutions were prepared by mixing different volumes of NaOH and HCl of different concentrations :

a. $60mL\,\frac{M}{10}HCl + 40mL\,\frac{M}{10}NaOH$

b. $55mL\,\frac{M}{10}HCl + 45mL\,\frac{M}{10}NaOH$

c. $75mL\,\frac{M}{5}HCl + 25mL\,\frac{M}{5}NaOH$

d. $100mL\,\frac{M}{10}HCl + 100mL\,\frac{M}{10}NaOH$

pH of which one of them will be equal to 1 ?

(1) b (2) a

(3) d (4) c

Ans. **(4)**

Sol. As $N_1V_1 > N_2V_2$

So acid is left at the end of reaction

$$N_{\text{final solution}} = [H^+] = \frac{N_1V_1 - N_2V_2}{V_1 + V_2}$$

$$= \frac{\frac{1}{5}\times 75 - \frac{1}{5}\times 25}{75+25}$$

$$= \frac{1}{10} = 0.1$$

$$pH = -\log[H^+] = 1$$

70. The solubility of $BaSO_4$ in water 2.42×10^3 gL^{-1} at 298 K. The value of solubility product (K_{sp}) will be
(Given molar mass of $BaSO_4$ = 233 g mol^{-1})
(1) 1.08×10^{-10} mol^2 L^{-2}
(2) 1.08×10^{-12} mol^2 L^{-2}
(3) 1.08×10^{-14} mol^2 L^{-2}
(4) 1.08×10^{-8} mol^2 L^{-2}

Ans. **(1)**

Sol. solubility of $BaSO_4 = 2.42 \times 10^{-3}$ gL^{-1}

$$\therefore s = \frac{2.42 \times 10^{-3}}{233} = 1.038 \times 10^{-5} \text{ mol } L^{-1}$$

$$K_{sp} = s^2 = (1.038 \times 10^{-5})^2$$
$$= 1.08 \times 10^{-10} \text{ mol}^2 \text{ L}^{-2}$$

71. Given van der Waals constant for NH_3, H_2 and CO_2 are respectively 4.17, 0.244, 1.36 and 3.59, which one of the following gases is most easily liquefied?
(1) NH_3 (2) H_2 (3) O_2 (4) CO_2

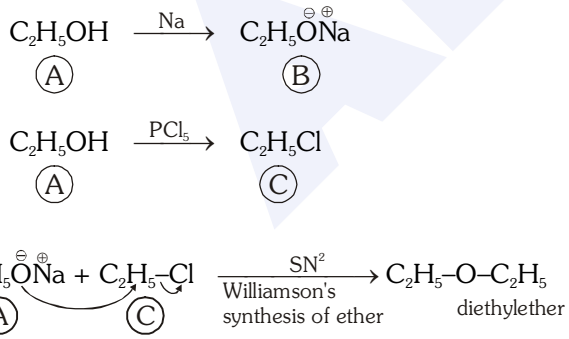
Ans. **(1)**

Sol. Critical temperature $\propto$ vanderwaal constant(a)
maximum "a" $\Rightarrow$ gas with maximum $T_C \Rightarrow$ easiest liquification = NH_3

72. The compound A on treatment with Na gives B, and with PCl_5 gives C. B and C react together to give diethyl ether. A, B and C are in the order
(1) C_2H_5OH, C_2H_6, C_2H_5Cl
(2) C_2H_5OH, C_2H_5Cl, C_2H_5ONa
(3) C_2H_5Cl, C_2H_6, C_2H_5OH
(4) C_2H_5OH, C_2H_5ONa, C_2H_5Cl

Ans. **(4)**

Sol.



73. Hydrocarbon (A) reacts with bromine by substitution to form an alkyl bromide which by Wurtz reaction is converted to gaseous hydrocarbon containing less than four carbon atoms. (A) is
(1) CH≡CH (2) CH_2=CH_2
(3) CH_3–CH_3 (4) CH_4

Ans. **(4)**

Sol. $CH_4 \xrightarrow[h\nu]{Br_2} CH_3\text{–}Br \xrightarrow[\text{ether}]{Na} CH_3\text{–}CH_3$
(less than four 'C')

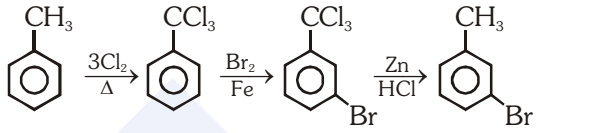
74. The compound C_7H_8 undergoes the following reactions :

$$C_7H_8 \xrightarrow{3Cl_2/\Delta} A \xrightarrow{Br_2/Fe} B \xrightarrow{Zn/HCl} C$$

The product 'C' is
(1) m–bromotoluene
(2) o–bromotoluene
(3) 3–bromo–2,4,6–trichlorotoluene
(4) p–bromotoluene

Ans. **(1)**

Sol.



m-bromotoluene

75. Which oxide of nitrogen is ***not*** a common pollutant introduced into the atmosphere both due to natural and human activity ?
(1) N_2O_5
(2) NO_2
(3) N_2O
(4) NO

Ans. **(1)**

Sol. Nitrous oxide (N_2O) occurs naturally in environment. In automobile engine, when fossil is burnt dinitrogen & dioxygen combine to yield NO & NO_2.

76. For the redox reaction
$MnO_4^- + C_2O_4^{2-} + H^+ \longrightarrow Mn^{2+} + CO_2 + H_2O$
the correct coefficients of the reactants for the balanced equation are

	MnO_4^-	$C_2O_4^{2-}$	H^+
(1)	16	5	2
(2)	2	5	16
(3)	2	16	5
(4)	5	16	2

Ans. **(2)**

Sol. $\overset{(+7)}{MnO_4^-} \longrightarrow Mn^{+2}; 5e^- \text{gain}$ (1)

$\overset{(+3)}{C_2}O_4^{-2} \longrightarrow \overset{(+4)}{CO_2} ; 2e^-$ loss (2)

multiplying (1) by 2 and (2) by 5 to balance e^-

$$2MnO_4^- + 5C_2O_4^{-2} \longrightarrow 2Mn^{+2} + 10CO_2$$

on balancing charge;

$$2MnO_4^- + 5C_2O_4^{-2} + 16H^+ \longrightarrow 2Mn^{+2} + 10CO_2 + 8H_2O$$

77. Which one of the following conditions will favour maximum formation of the product in the reaction,

$A_2(g) + B_2(g) \rightleftharpoons X_2(g)$ $\Delta_r H = -X$ kJ ?

(1) Low temperature and high pressure

(2) Low temperature and low pressure

(3) High temperature and high pressure

(4) High temperature and low pressure

Ans. (1)

Sol. For reaction $\Delta H = -$ ve and $\Delta n_g = -$ ve

$\therefore$ High P, Low T, favour product formation.

78. The correction factor 'a' to the ideal gas equation corresponds to

(1) density of the gas molecules

(2) volume of the gas molecules

(3) electric field present between the gas molecules

(4) forces of attraction between the gas molecules

Ans. (4)

Sol. Vanderwaal constant (a) $\propto$ forces of attraction.

79. When initial concentration of the reactant is doubled, the half-life period of a zero order reaction

(1) is halved (2) is doubled

(3) is tripled (4) remains unchanged

Ans. (2)

Sol. $(t_{1/2})_{zero} = \dfrac{[A]_0}{2K}$

$\therefore$ If $[A]_0$ = doubled, $t_{1/2}$ = doubled

80. The bond dissociation energies of X_2, Y_2 and XY are in the ratio of 1 : 0.5 : 1. ΔH for the formation of XY is -200 kJ mol^{-1}. The bond dissociation energy of X_2 will be

(1) 200 kJ mol^{-1} (2) 100 kJ mol^{-1}

(3) 800 kJ mol^{-1} (4) 400 kJ mol^{-1}

Ans. (3)

Sol. let B.E. of x_2 , y_2 & xy are x kJ mol^{-1}, 0.5x kJ mol^{-1} and x kJ mol^{-1} respectively

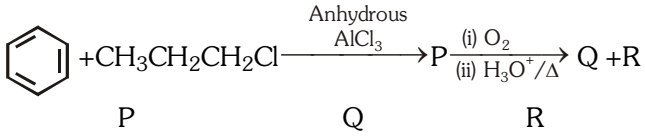
$$\frac{1}{2}x_2 + \frac{1}{2}y_2 \rightarrow xy; \Delta H = -200 \text{ kJmol}^{-1}$$

$$\Delta H = -200 = \Sigma(B.E)_{Reactant} - \Sigma(B.E)_{Product}$$

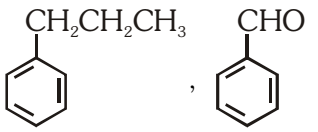
$$= \left[\frac{1}{2}\times(x) + \frac{1}{2}\times(0.5x)\right] - [1\times(x)]$$

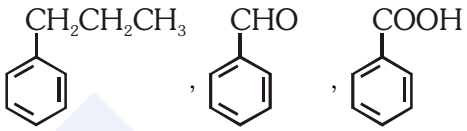
B.E of X_2 = x = 800 kJ mol^{-1}

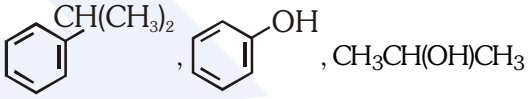
81. Identify the major products P, Q and R in the following sequence of reaction :

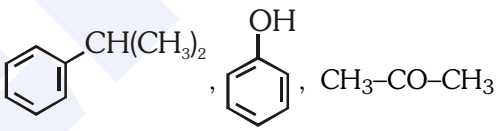


P Q R

(1) 

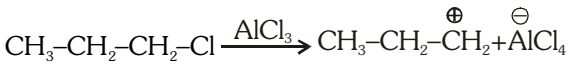
(2) 

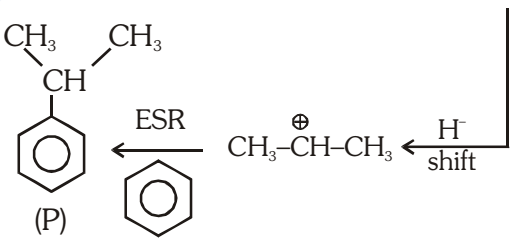
(3) 

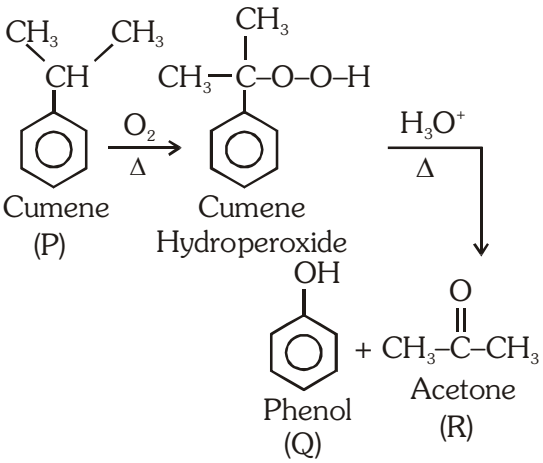
(4) 

Ans. (4)

Sol.

Mech: 





82. Which of the following compounds can form a zwitterion ?

(1) Aniline (2) Acetanilide

(3) Benzoic acid (4) Glycine

Ans. (4)

Sol. The molecule which forms zwitter ion is glycine.

$$HOOC-CH_2-NH_2 \rightleftharpoons \bar{O}OC-CH_2-\overset{\oplus}{N}H_3$$

Zwitter ion

83. The type of isomerism shown by the complex $[CoCl_2(en)_2]$ is

(1) Geometrical isomerism

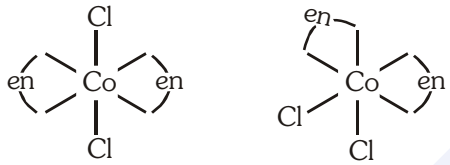
(2) Coordination isomerism

(3) Ionization isomerism

(4) Linkage isomerism

Ans. (1)

Sol.



Trans cis

84. Which one of the following ions exhibits d–d transition and paramagnetism as well ?

(1) CrO_4^{2-} (2) $Cr_2O_7^{2-}$

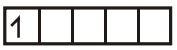
(3) MnO_4^- (4) MnO_4^{2-}

Ans. (4)

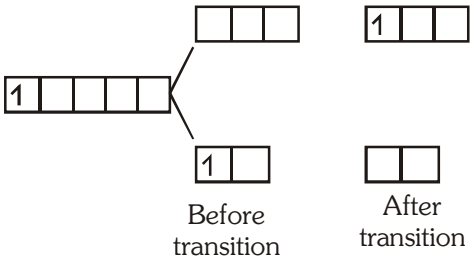
Sol. CrO_4^{-2} Cr^{+6} diamagnetic

$Cr_2O_7^{-2}$ Cr^{+6} diamagnetic

MnO_4^- Mn^{+7} diamagnetic

MnO_4^{-2} Mn^{+6} paramagnetic 

unpaired electron is present so d–d transition is possible.



Before transition After transition

85. The geometry and magnetic behaviour of the complex $[Ni(CO)_4]$ are

(1) square planar geometry and diamagnetic

(2) tetrahedral geometry and diamagnetic

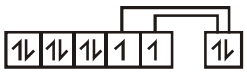
(3) square planar geometry and paramagnetic

(4) tetrahedral geometry and paramagnetic

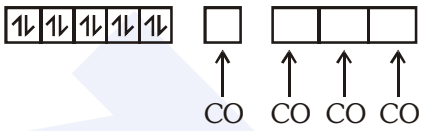
Ans. (2)

Sol. tetrahedral geometry and diamagnetic

$Ni \longrightarrow 3d^8 \ 4s^2$



CO is SFL so unpaired electrons will get paired.



sp^3 hybridisation

Tetrahedral, diamagnetic

86. Iron carbonyl, $Fe(CO)_5$ is

(1) tetranuclear (2) mononuclear

(3) trinuclear (4) dinuclear

Ans. (2)

Sol. $Fe(CO)_5$

EAN = Z–O.N. + 2(C.N.)

= 26 – 0 + 2(5)

= 26 + 10

= 36

only one central metal atom/ion is present and it follows EAN rule, so it is mononuclear

87. Match the metal ions given in Column I with the spin magnetic moments of the ions given in Column II and assign the ***correct*** code :

	Column I	Column II
a.	Co^{3+}	i. $\sqrt{8}$ B.M.
b.	Cr^{3+}	ii. $\sqrt{35}$ B.M.
c.	Fe^{3+}	iii. $\sqrt{3}$ B.M.
d.	Ni^{2+}	iv. $\sqrt{24}$ B.M.
		v. $\sqrt{15}$ B.M.

	a	**b**	**c**	**d**
(1)	iv	v	ii	i
(2)	i	ii	iii	iv
(3)	iv	i	ii	iii
(4)	iii	v	i	ii

Ans. (1)

Sol. Magnetic moment (μ) = $\sqrt{n(n+2)}$ B.M.

(a) $Co^{3+} \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^0\ 3d^6$

n = 4

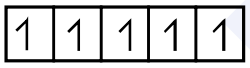
$\mu = \sqrt{4(4+2)} = \sqrt{24}$ B. M

(b) $Cr^{+3} \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^0\ 3d^3$

n = 3

$\mu = \sqrt{3(3+2)} = \sqrt{15}$ B.M.

(c) $Fe^{3+} \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^0\ 3d^5$



n = 5

$\mu = \sqrt{5(5+2)} = \sqrt{35}$ B. M.

(d) $Ni^{+2} \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^0\ 3d^8$

n = 2

$\mu = \sqrt{2(2+2)} = \sqrt{8}$ B. M.

88. Which of the following is correct with respect to –I effect of the substituents ? (R = alkyl)

(1) $-NH_2 < -OR < -F$

(2) $-NR_2 < -OR < -F$

(3) $-NH_2 > -OR > -F$

(4) $-NR_2 > -OR > -F$

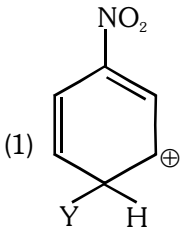
Ans. (1/2)

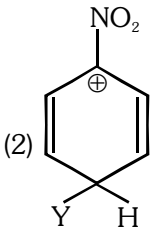
Sol. (Based on EN)

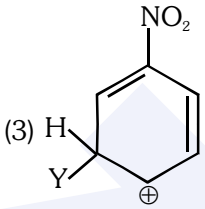
$\therefore$ $-NH_2 < -OR < -F$ –I effect

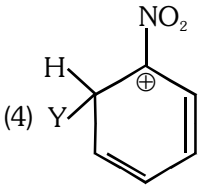
Also $-NR_2 < -OR < -F$ –I effect

89. Which of the following carbocations is expected to be most stable ?

(1) 

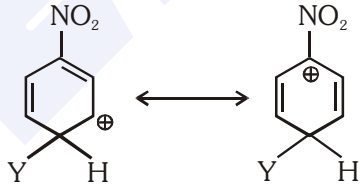
(2) 

(3) 

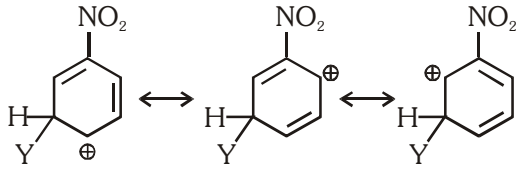
(4) 

Ans. (3)

Sol. $-NO_2$ group is meta-directing group



(Less stable due to more e^- withdrawing effect of $-NO_2$)



(More stable due to less e^- withdrawing effect of $-NO_2$)

90. Which of the following molecules represents the order of hybridisation sp^2, sp^2, sp, sp from left to right atoms ?

(1) $HC \equiv C - C \equiv CH$

(2) $CH_2 = CH - C \equiv CH$

(3) $CH_2 = CH - CH = CH_2$

(4) $CH_3 - CH = CH - CH_3$

Ans. (2)

Sol. $\overset{sp^2}{CH_2} = \overset{sp^2}{CH} - \overset{sp}{C} \equiv \overset{sp}{CH}$