

## SAMPLE HINTS AND SOLUTIONS

# INSTITUTE NAME & LOGO

### MHT-CET – EXAM YEAR

**Time : 45 Min**

**Chem : Full Portion Paper**

**Marks : 50**

### Hints and Solutions

**51) Ans: A)** they can withstand high temperature.  
Sol: These are the materials which can withstand very high temperature without melting or becoming soft.

**52) Ans: A)** HCHO

**53) Ans: A)** Nylon

Sol: Step growth polymerization involves condensation reaction between two difunctional monomer to form dimer which in turn, produce tetramer and so on with the loss of simple molecules like  $H_2O$ ,  $NH_3$ ,  $HCl$  etc.

**54) Ans: B)** the action of moist silver oxide.

Sol:  $Ag_2O + H_2O \rightarrow 2AgOH$

$C_2H_5Br + AgOH \rightarrow C_2H_5OH + AgBr$

**55) Ans: A)** adiabatic expansion.

Sol: When a real gas is forced through a porous plug into a region of low pressure, it is found that because of expansion, the gas on the side of low pressure gets cooled.

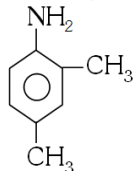
The phenomenon of producing lowering of temperature when a gas is made to expand adiabatically from a region of high pressure into a region of low pressure is known as Joule-Thomson effect.

**56) Ans: A)** the molecules aggregate because of hydrogen bonding in  $HF$ .

Sol: The molecules aggregate because of hydrogen bonding in  $HF$ .

**57) Ans: B)** same boiling and same freezing points.

**58) Ans: C)** 2, 4-dimethylaniline.



Sol:  $\text{CH}_3$  is a type of  $1^\circ$  amine and therefore gives +ve carbyl test.

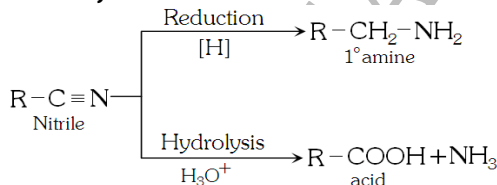
**59) Ans: A)**  $\Delta H$  is +ve;  $\Delta S$  is -ve.

Sol: Both +ve  $\Delta H$  and -ve  $\Delta S$  oppose the reaction.

**60) Ans: B)** Cinnabar

Sol: Cinnabar ( $HgS$ ) which is the ore of mercury, is concentrated by froth floatation process.

**61) Ans: A)** nitrile.

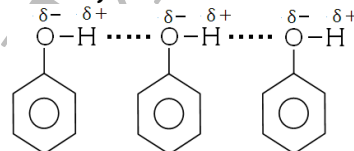


Sol:

**62) Ans: A)** 0.25

Sol: Here, Mole fraction of solute =  $\frac{20}{80} = 0.25$

**63) Ans: A)** Phenol



Sol:

**64) Ans: A)** Phenyl acetic acid

Sol: All acids are fatty acid except phenyl acetic acid.

**65) Ans: A)** Henry's law.

**66) Ans: C)** Hess's law.

**67) Ans: A)** diethyl ether.

Sol:  $2C_2H_5Br + Ag_2O \rightarrow C_2H_5-O-C_2H_5 + 2AgBr$   
Dry

If moist  $Ag_2O$  is used, then alcohol is formed.

$Ag_2O + H_2O \rightarrow 2AgOH$

$C_2H_5Br + AgOH \rightarrow C_2H_5OH + AgBr$

**68) Ans: D)** 33 min

Sol:  $x_{(g)} \longrightarrow y_{(g)} + z_{(g)}$

The reaction is a first order reaction, so

$$K = \frac{0.693}{t_{1/2}} = \frac{2.303}{t} \log \frac{a}{a-x} = \frac{0.693}{10 \text{ min}}$$

$$K = \frac{2.303}{t} \log \frac{a}{a/10}$$

$$= \frac{0.693}{10} = \frac{2.303}{t} \log 10$$

$$\therefore t = \frac{2.303 \times 10}{0.693} = 33 \text{ min}$$

**69) Ans: C)** 4

Sol:  $[Co(NH_3)_6]Cl_3 \rightleftharpoons [Co(NH_3)_6]^{3+} + 3Cl^-$

**70) Ans: C) 35**

Sol: Here, EAN of a central metal ion = (atomic no. of central atom) - oxidation state + no. of ligands  $\times 2$   
=  $26 - 3 + (6 \times 2) = 23 + 12 = 35$

**71) Ans: C)  $C_6H_5CHCl_2$**

Sol:  $C_6H_5CHCl_2$

**72) Ans: C) minimum P. E.**

Sol: Stable arrangement is provided by lowest potential energy level.

**73) Ans: B) - 70 calories**

Sol:  $S$  (rhombic) +  $O_2 \rightarrow SO_2$ ,  $\Delta H = 70960$  cal. ... (i)

$S$  (monoclinic) +  $O_2 \rightarrow SO_2$ ,  $\Delta H = 71030$  cal ... (ii)

We want,  $S$  (rhombic)  $\rightarrow S$  (monoclinic)

Thus, eq. (i) - eq. (ii) gives the required result.

**74) Ans: C) collision frequency increases.**

Sol: As the temperature is increased, heat energy is supplied which increases the kinetic energy of the reacting molecules. This will increase the number of collisions and ultimately the rate of reaction will be enhanced.

**75) Ans: B) Aldehydes**

**76) Ans: B) C-Mg bond.**

Sol: Because of C-Mg bond.

**77) Ans: A) Analgin**

Sol: An analgesic drug is one that relieves or decreases the pain such as analgin, aspirin (belongs to non-narcotics) and morphine, codeine, heroin (belongs to narcotics class).

**78) Ans: C)  $C_2H_5OH$**

Sol: As  $C_2H_5OH$  is a non-electrolyte, so it does not ionize.

**79) Ans: B) non-corrosive.**

**80) Ans: B) changes abruptly from solid to liquid when heated.**

Sol: In crystalline solid, there is a perfect arrangement of the constituent particles only at 0 K. When the temperature increases, the chance that a lattice site may be unoccupied by an ion increases. When the number of defects increases with temperature, solid changes into liquid.

**81) Ans: B) primary alcohol**

Sol:  $R-CHO \xrightarrow{\text{Reduction}} R-CH_2-OH$   
Aldehyde 1° alcohol

**82) Ans: D) 0.5 F**

Sol:  $Na^+ + e^- \rightarrow Na$

Now, Charge (in F) = moles of  $e^-$  used = moles of Na

deposited =  $\frac{11.5}{23} g = 0.5$  Faraday

**83) Ans: B) the atomic weight.**

Sol: The atomic weight;

Equivalent weight =  $\frac{\text{Atomic weight}}{\text{No. of } e^- \text{ lost or gained}}$

Now,  $Fe^{2+} \rightarrow Fe^{3+} + e^-$

$\therefore$  Equivalent weight = Atomic weight

**84) Ans: B) mercurous chloride.**

Sol: Mercurous chloride is insoluble in water whereas rest are soluble in water.

**85) Ans: D) Horn silver**

Sol: Horn silver ( $AgCl$ )

**86) Ans: A) Friedel-Craft's reaction**

Sol: Friedel-Craft's reaction is used to prepare alkyl benzene or acetophenone. It is not a method to prepare amine.

**87) Ans: C) sulphur.**

**88) Ans: A) 9 sigma bonds, 3 pi bonds and 2 non-bonding electrons.**

Sol: Allyl isocyanide i.e.  $CH_2 = CH - CH_2 - N \equiv C$

**89) Ans: A) butanone.**

**90) Ans: B) Haber.**

Sol: Haber's process  $\rightarrow$  Industrial process

$$N_2 + 3H_2 \xrightleftharpoons[200-350 \text{ atm}]{\begin{matrix} Fe-Mo \\ 650-800 K \end{matrix}} 2NH_3$$

**91) Ans: B) high B.P.**

Sol: Since,  $Na^+$  as well as  $K^+$  controls blood pressure and heart beat, thus excess of  $Na^+$  ion increases B.P.

**92) Ans: D) Rn**

Sol: Rn cause it is radioactive element obtained by the disintegration of radium.

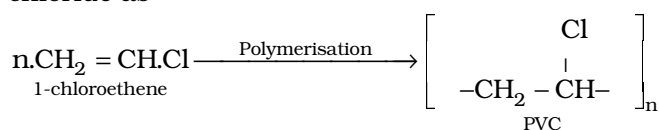
${}_{88}Ra^{226} \rightarrow {}_{86}Rn^{222} + {}_2He^4$

**93) Ans: A) Cancer**

Sol: "Cancer" is termed as molecular disease.

**94) Ans: D) 1-chloroethene.**

Sol: PVC i.e. polyvinyl chloride is a polymer of vinyl chloride as



**95) Ans: C)  $H_2$**

Sol: Water is reduced at the cathode while oxidized at the anode instead of  $Na^+$  and  $SO_4^{2-}$ .

At cathode:  $2H_2O + 2e^- \rightarrow H_2 + 2OH^-$

At anode:  $H_2O \rightarrow 2H^+ + \frac{1}{2}O_2 + 2e^-$

**96) Ans: B)** fatty acid.

Sol: Oleic acid, stearic acid as well as palmitic acids are produced by the hydrolysis of fats and the acid produced by hydrolysis of fats are known as fatty acid.

**97) Ans: B)** the order of the reaction is  $m + n$ .

Sol: If rate =  $K(A)^m(B)^n$ , then the order of reaction =  $m + n$ .

**98) Ans: A)** diastase.

Sol: Starch  $\xrightarrow{\text{Diastase}}$  Maltose

**99) Ans: B)** Tertiary > Secondary > Primary

Sol:  $R-OX + HX \rightarrow R-X + H_2O$

Reactivity order of alcohols for this reaction is  $3^\circ > 2^\circ > 1^\circ$ .

$\therefore$  Reactivity order of halogen acids

$R-I > R-Br > R-Cl$ .

**100) Ans: C)**  $60 \times 10^{-3}$

Sol: Here,  $\frac{-d(N_2)}{dt} = -\frac{1}{3} \frac{d(H_2)}{dt} = \frac{1}{2} \frac{d(NH_3)}{dt}$

$\frac{-d(N_2)}{dt} = \frac{3}{2} \times 40 \times 10^{-3} = 60 \times 10^{-3}$