WEEKLY EXAM 2080/09/01

Subject: Chemistry | **GRADE XII (SCIENCE)** | **F.M.: 40**

Time : 1:30 hrs. | **SET A** | **P.M.: 20**

Group A

[7×1 = 7]

Multiple choice questions:

1. What would be the value of rate constant (k) if the concentration of reactant is increased by 'X'

   a) $\ln\frac{k}{x}$ b) $\frac{k}{x}$ c) $k + x$ d) k

2. 0.715 g of $Na_2CO_3 \cdot x\, H_2O$ required 20 mL of seminormal hydrochloric acid solution for complete reaction. Find the value of x.

   a) 1 b) 2 c) 3 d) 4

3. Calculate the number of H^+ ion present in 1mL solution having pH=13.

   a) 6.02×10^{7} b) 6.02×10^{8} c) 6.02×10^{9} d) 6.02×10^{10}

4. Phenol on treatment with conc. HNO_3 in the presence of Conc. H_2SO_4 gives

   a) m-nitrophenol b) O-nitrophenol

   c) p- nitrophenol d) Picric acid

5. In reaction of chloroform with primary amine in ethanolic solution of KOH is termed as

   a) Hoffmann's reaction b) Carbylamine reaction

   c) Reimer-Tiemann's reaction d) Kolbe's reaction

6. Phenol is heated with $CHCl_3$ and alc. KOH then produce salicylaldehyde. The reaction is called.

   a) Friedel-Craft reaction b) Rosenmund's reaction

   c) Reimer-Tiemann reaction d) Coupling reaction

7. A blue colored salt of group II metal ion gives a blue precipitate with NaOH which on boiling gives black precipitate of

   a) Cu_2O b) CuO c) HgO d) ZnO

Group B

[5×5=25]

1. a) 1 gram of a divalent metal was dissolved in 25 mL of 1 M H_2SO_4. The unreacted acid further required 16 c.c. of NaOH (f = 0.8) for complete neutralization. [1+2]

   i) Calculate the gram equivalent of unreacted acid

   ii) Find the atomic weight of metal.

   b) Derive $pH + pOH = P^{kw}$. [2]

2. State and derive Ostwald's dilution law and mention its limitation. Calculate the pH of 10^{-7} M HCl solution. [3+2]

3. An aliphatic halo alkane (A) gives compound (B) when heated alc NaOH. The compound (B) reacts with HBr to give major pro (C) on heating compound (C) with sodium in the presence of dryeth yields 2, 3-dimethyl butane. What product will you expect when the compound (B) is subjected to ozonolysis? Compound A gives secondary alcohol with aq. NaOH. [5]

4. Penta-hydrated copper sulphate is called blue vitriol. [5×1 = 5]
   i) Starting from metallic, copper, how can you obtain blue vitriol?
   ii) What happens when aq. Solution of blue vitriol is treated with excess ammonia solution?
   iii) Give chemical reaction of conversion of blue vitriol into black oxide.
   iv) Why is hydrated copper sulphate called blue vitriol?
   v) Write any two application of blue vitriol.

5. The following data are given for the reaction $2x + y \rightarrow z$ [2+1+1+1]

Exp. No	[X] mol L^{-1}	[Y] mol L^{-1}	Initial rate mol L^{-1} S^{-1}
1	0.1	0.1	7×10^{-3}
2	0.3	0.2	8.4×10^{-2}
3	0.3	0.4	3.36×10^{-1}
4	0.4	0.1	2.8×10^{-2}

Calculate:
   i) The order with respect to X and Y
   ii) Rate constant
   iii) Half life of reaction with respect to x
   iv) Rate of formation of product when [X] = 0.6 mol L^{-1} and Y = 0.3 mol L^{-1}

Group C [1×8=8]

1. a) An alcohol (P) having molecular formula $C_4H_{10}O$ undergoes victor – Meyers test to give blue colour at the end of reaction when added KOH solution.
      i) Draw structure formula and write IUPAC name of P. [1]
      ii) Write down complete chemical reaction for the victor meyer test of P. [2]
      iii) How would you prepare (P), starting form CH_3MgBr? [2]
   b) What products would you obtain when phenol is treated with
      i) aqueous bromine [1]
      ii) Benzene diazonium chloride [1]
   c) What is the laboratory test of phenol? [1]

All the best