24225

3 Hours / 70 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions :   (1)   All Questions are *compulsory.*

(2)   Answer each next main Question on a new page.

(3)   Illustrate your answers with neat sketches wherever necessary.

(4)   Figures to the right indicate full marks.

(5)   Use of Non-programmable Electronic Pocket Calculator is permissible.

(6)   Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1.   **Attempt any FIVE :**   **10**

(a)   Define the following terms :

(i)   Strength of acid

(ii)   Strength of base

(b)   Distinguish between acids and bases. (2 pts)

(c)   Define :

(i)   Osmosis

(ii)   Reverse Osmosis

(d)   List the factors affecting on rate of reaction.

(e)   Define following terms :

(i)   Oxidation

(ii)   Reduction

(f) State first law of thermodynamics.

(g) Write principle of extraction theory.

2. **Attempt any THREE :** 12

(a) Explain the concept of Lewis acid and Lewis base with suitable example.

(b) Describe the process of reverse osmosis drawing labelled diagram.

(c) Consider the following reaction and explain the concept of rate of reaction :

aA + bB $\longrightarrow$ cC + dD, where – a is no. of molecules of reactant A, b is no. of molecules of reactant B, c is no. of molecules of product 'C' and d is no. of molecules of product 'D'.

(d) Explain the role of reducing agent in dyeing cotton fabric with vat dyes.

3. **Attempt any THREE :** 12

(a) Dyeing and printing on wool is carried at acidic pH. Suggest the different reagents required to maintain acidic pH. Select the reagent which are preferred for dyeing with acid dyes.

(b) Determine the molecular weight and equivalent weight of H_2SO_4. Molecular weight of H_2SO_4 is not same as that its equivalent weight. Predict the reason. (At. wt. of H = 1, S = 32, O = 16)

(c) Distinguish between endothermic and exothermic reaction with suitable example.

(d) Explain the role of $SnCl_2$ in discharge printing.

4. **Attempt any THREE :** 12

(a) Explain the concept of pH using its mathematical equation.

(b) Describe the procedure to measure heat change occurring during neutralization reaction.

(c) Explain the term 'heat of combustion'. List of some fuels is given below. Identify the fuel which will have highest value of heat of combustion.

    (i)   charcoal

    (ii)   diesel

    (iii) petrol

    (iv) bagasse

(d) Distinguish between association and dissociation.

(e) 20 ml alcohol is mixed in water. Suggest the method of extracting alcohol from water. Identify the solvent used for extraction with suitable reasoning.

5. **Attempt any TWO :** 12

(a) List of some salts is given below. Select the salt which will behave as acid liberating agent in their aqueous solutions. Illustrate with suitable reasoning and chemical reactions.

    (i)   Potassium sulphate (K_2SO_4)

    (ii)   Sodium bicarbonate ($NaHCO_3$)

    (iii) Alum

(b) Calculate the weight of solid Na_2CO_3 required for preparing 0.2 N Na_2CO_3 solution. Identify the chemicals required for standardization of prepared solution.

(c) Polyster fibre was dyed with dispersed dye at 130 °C. The temperature of dye bath was raised through 3 °C per minute. Predict the reason of gradual raising of temperature. Identify the other chemicals used in this process which affect on dyeing kinetics.

6. Attempt any TWO : 12

(a) Identify the chemicals used in determining strength of hydrogen peroxide. Suggest the indicator which can be used in the titration. Predict the role of oxidizing and reducing agent in this titration with suitable chemical reaction.

(b) Suggest the type of heat of reactions which you will consider while preparing liquor for scouring process. Justify your answer with suitable chemical reactions.

(c) Suppose solute A undergo association. Solute B undergo dissociation. Solute C neither dissociate nor associate in aqueous solution. Predict the solute which can be separated by applying distribution law. Give the suitable reasoning for the same.

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