

(2 ½ Hours)

[ Total Marks :75

- N.B. :** (1) All questions are compulsory.  
 (2) All questions carry equal marks.  
 (3) Figures to the right indicate marks.  
 (4) Draw neat labelled diagrams wherever necessary.  
 (5) Use of log table and non-programmable calculators is allowed.

1. Do as directed : (any fifteen)

15

State the IUPAC name :

- (1)  $\text{CH}_3\text{-CH=CH-CH}_2\text{-CH}_3$
- (2)  $\text{HCOOH}$
- (3)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH}$ .
- (4)  $\text{CH}_2\text{OH-CH}_2\text{OH}$
- (5)  $\text{HCOOCH}_3$
- (6)  $\text{CH}_3\text{COCH}_2\text{CH}_3$
- (7)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{NH}_2$

Explain the term :

- (8) Formula unit
- (9) Polarity
- (10) Electorovalent compound
- (11) Atomic radii
- (12) Non covalent bond

Give an example of :

- (13) Tetrahedral arrangement
- (14) Body centred cubic
- (15) Explain the term-Lewis Base
- (16) Acidic solutions contain high concentration of :  
 (a)  $\text{H}^+$  ion (b)  $\text{OH}^-$  ions (c) Water (d) Oxygen
- (17) How would you make 1 ppb solution?
- (18) Define -Molarity
- (19) Buffers are mixtures of : select a correct option out of following :  
 (a) Strong acid and strong base  
 (b) Strong acid and weak base  
 (c) Weak acid and their conjugate base  
 (d) Weak base and their conjugate acid.
- (20) What is the pH of a neutral solution?

2. (a) Draw structures of the following organic compounds. 8
- (i) Isopentane
  - (ii) 2-Chloro Propanamine
  - (iii) 2- Butanone
  - (iv) Pentanedioic acid
- (b) Describe IUPAC nomenclature of alkanes using suitable examples. 7
- OR**
- (c) Draw structures of the following organic compounds. 8
- (i) Butanedioic acid
  - (ii) 2,2 - Dimethyl -1- Propanol
  - (iii) Cyclopentane
  - (iv) 3- pentanone
- (d) Discuss IUPAC nomenclature for alkenes using suitable examples. 7
3. (a) What are Van der Waals forces? Explain why ethane is a gas and octadecane is a solid? 8
- (b) Explain the structure of NaCl and KCl. 7
- OR**
- (c) What is co-ordinate bond? Explain using suitable examples. 8
- (d) Explain hydrogen bonding in ROH and Polyamides. 7
4. (a) Derive the Henderson-Hasselbalch equation for an Basic buffer, and calculate normality of the solution, which contain 3.6 gm of oxalic acid ( $H_2C_2O_4 \cdot 2H_2O$ ) in 150ml. (Molar mass of oxalic acid = 126.) 8
- (b) What do you mean by Hydrolysis of salt? In detail explain hydrolysis of salt of strong acid with strong base. 7
- OR**
- (c) Describe the structure and properties of water. 8
- (d) State significance of buffer solution and calculate the pH of buffer composed of 0.10 M weak base BOH and 0.13M of its salt BA. 7  
(Given  $k_b = 1.8 \times 10^{-5}$  for weak base BOH)
5. Write short notes on **any three** of the following :- 15
- (i) Classification of aliphatic alcohol
  - (ii) IUPAC nomenclature of carboxylic acids
  - (iii) Nature of ionic bond
  - (iv) Hydrophobic effect
  - (v) Mechanism of Buffer action