Q.P Code : 754004

(3 Hours) Total Marks:100

Instructions:

1. **All** questions are **compulsory**. Choice is **internal**.
2. **Figures** to the **right** indicate **full marks**.
3. Draw structures and diagrams wherever necessary

1. A. Define and explain: **10**
   i. Anomers
   ii. Polar compounds
   iii. Peptide bond
   iv. Ketopentose
   v. Biomolecules

   B Write true or false with reasons: **10**
   i. Glucose and mannose are isomers of each other.
   ii. In strongly acidic pH, an amino acid is negatively charged.
   iii. Myosin is an example of phosphoprotein.
   iv. Lactose has α (1→4) glycosidic bond.
   v. Water exhibits a concave meniscus.

2. Answer the following (**any four**): **20**
   i. Elaborate on ionisation of water.
   ii. Write a note on chemical properties of water.
   iii. Write a note on pH.
   iv. Explain Lewis theory of acids and bases.
   v. a) Define the term hydrophilicity.
      b) How would you prepare 500 ml of 0.1 M and 2 N NaCl solution? Given: Molecular weight of NaCl is 48.5.
   vi. a) Define mole and equivalent weight.
      b) Justify: Water has high surface tension.
   vii. Explain: Water has a unique structure. Add a note on importance of water in life.
   viii. a) From a 45 % w/v solution of Na_2SO_4, how would you prepare 750 ml of 5% w/v Na_2SO_4?
      b) What is the pH of 1 N HNO_3?

TURN OVER

3. Elaborate on **(any four)**: **20**

i. Classification of amino acids based on polarity
ii. Protein denaturation
iii. Chemical reaction of amino acids with
  a) Sanger's reagent
  b) Edman's reagent
iv. Secondary structure of proteins.
v. Classification of proteins based on function
vi. Properties of proteins
vii. Zwitter ion & isoelectric pH of amino acids
viii. Nonessential amino acids. Give the structure of any two.

4. Discuss the following **(any four)**: **20**

i. Inversion of sucrose.
ii. Classification of carbohydrates.
iii. Composition and biochemical importance of maltose.
iv. Reduction of glucose.
v. Osazone formation of monosaccharides.
vi. Structure and significance of glycogen.
vii. Functions of carbohydrates.
viii. Structures of: a) α–D–mannose b) L-fructose

5. Attempt the following**(any four)**: **20**

i. With suitable examples discuss heteropolysaccharides.
ii. a) What is the amount of solute A in 250 ml of 2.0 M solution, if the molecular weight of this biomolecule is 100?
  b) Write on hydrogen bond and its significance.
iii. Draw the structure of following:
  a)Methionine
  b)Threonine
iv. a)Explain the use of K_b in biochemical experiment.
  b)What is a physiological buffer? Give one example.
v. Write briefly on charged amino acids.
vi. Give the structure of following:
  a) β-D-glucose
  b) D-ribose