

(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:

- i. Anomers
- ii. Polar compounds
- iii. Peptide bond
- iv. Ketopentose
- v. Biomolecules

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B Write true or false with reasons:

- 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 $\rightarrow$ 4) glycosidic bond.
- v. Water exhibits a concave meniscus.

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2. Answer the following (**any four**):

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- 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
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