

- Note:** i. All questions are compulsory.
ii. Figures to the right indicate full marks.
iii. Draw structures and diagram wherever necessary.

Q.1A) State True or False.**(04)**

- Freezing point of water is 40°C.
- Hydrogen bonds provide adhesive forces to structure of water.
- Hydrophobic substances dissolve in water.
- Entropy increases when crystalline substances dissolve in water.

Q.1B) Answer the following. (Any three)**(09)**

- Give an account of ionization of water.
- Explain Molarity with equation.
- Calculate Hydroxyl ion concentration of solution with a pH 6.
- Structure of water.
- Explain surface tension and viscosity of water.
- Explain latent heat and specific heat of water.

Q.1C) Answer the following. (Any two)**(12)**

- Explain buffer with examples.
- Describe physical properties of water.
- What is the interaction of water with solutes?
- Importance of water.

Q.2A) State True or False.**(04)**

- Myoglobin and Hemoglobin are examples of Globular proteins.
- Ninhydrin when reacts with amino acids produces Methylene blue dye.
- Edman degradation is a method of sequencing amino acids in a peptide.
- Hemoglobin molecule is made up of five heme groups.

Q.2B) Answer the following. (Any three)**(09)**

- Write in short about Ampholytes.
- What are Polypeptides?
- Draw structure of both Glycine and Valine.
- Write in brief about optical rotation.
- Explain Fibrous proteins.
- Write a note on non-essential amino acids.

Q.2C) Answer the following. (Any two)**(12)**

- Explain Primary and Tertiary structure of protein in detail.
- Write in brief about chemical properties of amino acids.
- Describe in detail the chemical reaction of amino acids with Ninhydrin reagent.
- Elaborate on any four physical properties of amino acids.

Q.3A) State True or False.**(04)**

- i. Simple sugars are also called polysaccharides.
- ii. Animals store carbohydrates as starch.
- iii. Carbohydrates always have 2:1 ratio of oxygen and hydrogen.
- iv. Humans can digest carbohydrate fibers.

Q.3B) Answer the following. (Any three)**(09)**

- i. What is a glycosidic bond? Explain the formation of 1,4 –glycosidic bond with an example.
- ii. Give reason: Glucose and Galactose gives same osazones.
- iii. Describe the difference between maltose, lactose, sucrose with respect to occurrence and structure.
- iv. Write a detail note on stereoisomerism of carbohydrates.
- v. Give the classification of carbohydrates.
- vi. With the help of reaction, explain the Lobry de Bruyn Alberda Van Ekenstien transformation.

Q.3 C) Answer the following. (Any two)**(12)**

- i. Elaborate on galactose with respect to structure, occurrence and significance.
- ii. With the help of structure, describe the similarity and dissimilarity between galactose and mannose.
- iii. Explain with an example, which carbon is considered the anomeric carbon. How can you distinguish between the alpha and beta type of anomers?
- iv. Draw structure of D-glucose, convert it into L-glucose and comment on its stereochemical property with respect to whether they are two version of enantiomer.

Q.4 A) Define and explain: (Any five)**(10)**

- | | | | | |
|----------------------|---------------|-------------------|--------|--------------------|
| i. Normality | ii. Mole | iii. Zwitter ions | iv. pI | v. Stereoisomerism |
| vi. Oligosaccharides | vii. Solution | | | |

Q.4 B) Answer the following. (Any three)**(15)**

- i. Explain buffer with examples.
- ii. Describe physical properties of water.
- iii. Describe in detail chemical reaction of amino acid with Sanger's Reagent.
- iv. Discuss protein denaturation in detail.
- v. Write a note on lactose intolerance.
- vi. Explain glucose metabolism.

-----XXXXXXXXXXXX-----