[Time: Three Hours] **[Marks:100]**

Please check whether you have got the right question paper.

N.B:
1. **All** questions are **compulsory**. Choice is **internal.**
2. Figures to the **right** indicate **full** marks.
3. **Draw structures** and **diagrams** wherever necessary.
4. Normal calculator or log tables can be used if required.

Q.1 A) State true or false: **04**

i. Potassium chloride is a weak electrolyte.
ii. Boiling point of water is 4°C.
iii. H_2SO_4 : Acid :: H^+ : Conjugate base.
iv. Covalent bond is formed by exchange of electron pair.

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

i. How will you prepare 250 ml of 0.5 N sodium acetate. (MW=82)
ii. Write a note on ionization of water.
iii. Give an account of Vander Waal interaction.
iv. Elaborate on the action of acetate buffer to resist the change in pH.
v. Calculate the hydroxyl ion concentration of solution with pH 5.
vi. Elaborate on dissociation of weak acids and strong acids.

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

i. Give detailed account of carbonate buffer
ii. Define pH and determine the pH of following solutions.
a) 0.00001 M HNO_3 b) 0.00001 M KOH
Add a note on relationship between normality and molarity.
iii. Explain the structure of water and add a note on importance of water in life
iv. With the help of suitable examples, explain the interaction of polar and non polar molecules with water.

Q.2 A) State true or false: **04**

i. Histidine is an example of a non essential amino acid.
ii. Fibrous proteins are found to have more beta sheets compared to globular proteins.
iii. Zwitter ion refers to the amino acid in neutral pH.
iv. Albumin is an example of fibrous protein.

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

i. Explain the importance of ammonium sulphate in protein precipitation. Suggest an alternative salt for the same.
ii. Giving examples enlist the physiological functions of proteins.
iii. Draw the structures of D- glutamate, L-Glutamine and L-glycine.
iv. Describe in brief 'beta pleated sheets'.
v. Which colour is produced when ninhydrin reacts with proline? Write the reactions leading to formation of Ruheman's purple.
vi. Write in brief regarding **any three** physical properties of amino acids.

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

i. Elaborate on the method used for determination of the complete amino acid sequence of proteins.
ii. Comment on the classification of proteins based on nutrition.
iii. Differentiate between simple and conjugated proteins. Add a note on derived proteins.
iv. Giving example elaborate on tertiary structure of proteins.

Q.3 A) State true or false: **04**

i. Hyaluronic acid is a polymer of D-galacturonic acid and N-acetyl-D- glucosamine.
ii. Cellulose has calorific value
iii. Lactose has a β-glycosidic bond.
iv. Aspartame is a non-caloric sweetener.

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

i. State true or false, giving reasons: "Glucose and mannose gives the same osazones".
ii. Write a detailed note on 'optical isomerism' in sugars.
iii. Give chemical reactions to prove that enolization involves inter-conversion of glucose, mannose and fructose.
iv. Elaborate on the functions attributed to carbohydrates.
v. Discuss the classification of sugars based on: (a) functional groups (b) number of carbon atoms.
vi. With the help of Fischer projections, explain epimers.

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

i. In what forms are carbohydrates stored in plants and animals? Discuss the same in detail, highlighting their points of difference.
ii. Explain the disaccharide maltose under the following headings: (a) structure (b) type of linkage/bond (c) occurrence (d) characteristic properties
iii. Write a note on - (i) Glycosidic bonds and (ii) Heteropolysaccharides
iv. With the help of structures, explain the (a) oxidation reactions of glucose (b) reaction of ribose with orcinol.

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

(i) Normality (ii) Dalton (iii) Kw (iv) Peptide bond (v) Renaturation
(vi) Furanose (vii) Mannitol

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

i. Write a note on hydrogen bond.
ii. Give an account of colligative properties of water.
iii. Elaborate on classification of amino acids with respect to polarity of the molecule.
iv. What is denaturation? Mention the agents responsible for the same.
v. How are sugars classified on the basis of their reducing/non-reducing nature? Explain the same in detail with examples.
vi. Compare and contrast lactose and sucrose, under the following headings: (a) structure (b) glycosidic linkage (c) function/role

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