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**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY,
ODISHA, GUNUPUR
(GIET UNIVERSITY)**

**B. Sc. (Ag.) (Third Semester) Examinations, November – 2024
AC-213- Fundamentals of Plant Biochemistry**

Time: 2 hrs

Maximum : 50 Marks

The figures in the right hand margin indicate marks.

PART – A

Q.1. Fill in the blanks with suitable word / figure.**(0.5 x 10 = 5 Marks)**

- a. _____ is known as father of biochemistry.
- b. The main function of carbohydrates is to provide _____ for cellular activities.
- c. Cellulose is a _____ that provides structural support in the cell walls of plants.
- d. The sequence of amino acids in a protein is known as its _____ structure.
- e. _____ fats have no double bonds in their fatty acid chains and are usually solid at room temperature.
- f. Essential amino acids are those that cannot be synthesized by the body and must be obtained through _____.
- g. The energy currency of plant cells is _____, produced during cellular respiration.
- h. Hemoglobin is an example of a _____ protein that binds and transports oxygen.
- i. Phospholipids have a _____ head and two hydrophobic tails, making them amphipathic.
- j. Adenine pairs with _____ in DNA.

Q. 2. Define (or) Explain the following in one or two sentences.**(1 x 5 = 5 Marks)**

- a. Anomer
- b. Isoelectric pH
- c. Iodine number
- d. Purine
- e. Apoenzyme

Q3. Match the following**(0.5 x 10 = 5 Marks)****Column – A****Column – B**

- | | |
|-------------------------|----------------------------|
| (a) MUFA | (i) D-Loop |
| (b) Nucleotide | (ii) Tyrosine |
| (c) Stachyose | (iii) Glycosidic bond |
| (d) Nucleoside | (iv) Cyclic |
| (e) Aromatic amino acid | (v) Chain |
| (f) Anomer | (vi) Phosphomonoester bond |
| (g) t-RNA | (vii) Tetrose |
| (h) Raffinose | (viii) Linoleic acid |
| (i) Enantiomer | (ix) Oleic acid |
| (j) PUFA | (x) Triose |

Q4. Write True or False against each statement

(0.5 x 10 = 5 Marks)

- a. Sucrose is a disaccharide composed of glucose and fructose.
- b. Amino acids are the building blocks of lipids.
- c. Phospholipids are important components of cell membranes.
- d. The pentose sugar ribose is a component of RNA.
- e. Acid value of a lipid sample denotes the measure of free fatty acid in that sample.
- f. Tricarboxylic acid cycle is the centre of metabolism for plant cells.
- g. Translation process occurs inside mitochondria.
- h. Protein is known as the “Staff of life”.
- i. Proteins can function as hormones, such as insulin.
- j. Waxes are a type of lipid that is often found in the protective coating of leaves and fruits.

PART – B

Attempt ANY FIVE questions. All question carries equal marks

(6 x 5 = 30 Marks)

- 5. Explain the properties of monosaccharides, emphasizing their structural characteristics.
- 6. Explain the various classifications of proteins, highlighting their structural and functional diversity in plant cells.
- 7. Investigate the properties of lipids, considering their solubility, melting points, and other relevant physical and chemical characteristics.
- 8. Describe the process of nucleic acid formation, outlining the key steps involved in the synthesis of DNA and RNA.
- 9. Differentiate between A, B, and Z DNA structures, discussing their unique conformations.
- 10. Discuss the factors influencing enzymatic activity, considering temperature, pH, substrate concentration, and the role of cofactors.

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