2023

(CBCS)

(6th Semester)

BOTANY

ELEVENTH PAPER

(Plant Metabolism, Biochemistry and Thermodynamics)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. DNA replication starts at a specific point called

(a) origin ( )

(b) replication ( )

(c) Okazaki fragment ( )

(d) primer site ( )

2. Purine/Pyrimidine bases, together with pentose sugar form

(a) nucleotides ( )

(b) nucleosides ( )

(c) ribose sugars ( )

(d) deoxyribose sugars ( )

3. The primary structure of protein involves

(a) hydrogen bonding ( )

(b) disulphide bonding ( )

(c) van der Waals forces ( )

(d) covalent bonding ( )

4. Multiple forms of enzyme with the same catalytic activity but different structures are

(a) coenzymes ( )

(b) allosteric enzymes ( )

(c) isoenzymes ( )

(d) lysozymes ( )

5. Which one of the following is the precursor of indole-3-acetic acid biosynthesis?

(a) -ketoglutaric acid ( )

(b) Fumaric acid ( )

(c) Tryptophan ( )

(d) Glutathione ( )

6. The plant hormone responsible for cell division is

(a) gibberellin ( )

(b) cytokinin ( )

(c) auxin ( )

(d) ABA ( )

7. The light-dependent reaction of photosynthesis takes place in

(a) whole chloroplast ( )

(b) grana ( )

(c) stroma ( )

(d) grana and stroma ( )

8. Red drop is

(a) drop in quantum yield ( )

(b) drop in oxygen yield ( )

(c) drop in organic yield ( )

(d) drop in photosynthetic yield ( )

9. If a reaction is being carried out at constant temperature and pressure, the change in quantity is called

(a) internal energy ( )

(b) entropy ( )

(c) enthalpy ( )

(d) free energy ( )

10. An arrangement where no energy or matter is exchanged between a system and its surroundings is called

(a) open system ( )

(b) closed system ( )

(c) isolated system ( )

(d) None of the above ( )

(SECTION : B—SHORT ANSWER)

(*Marks* : 15)

Write short notes on the following : 3×5=15

UNIT—I

1. Synthesis of cellulose

OR

2. Synthesis of lipids

UNIT—II

3. Tertiary structure of protein

OR

4. Isoenzymes

UNIT—III

5. Biosynthesis of Gibberellins

OR

6. Mode of action of abscisic acid

UNIT—IV

7. Photosynthetic apparatus

OR

8. Non-cyclic electron transport

UNIT—V

9. Concept of internal energy

OR

10. Enthalpy change

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following questions : 10×5=50

UNIT—I

1. Write accounts on the following : 5×2=10

(a) Synthesis of amino acids

(b) DNA replication

OR

2. Write notes on the following : 5×2=10

(a) Biological nitrogen fixation

(b) Synthesis of starch

UNIT—II

3. Write accounts on the following : 5×2=10

(a) The mechanism of protein synthesis with labelled diagram

(b) Basic aspects of protein conformation

OR

4. Write notes on the following : 5×2=10

(a) Mechanism of enzyme action

(b) Enzyme kinetics

UNIT—III

5. Describe the biosynthesis and mode of action of auxin. 10

OR

6. Write notes on the following : 5×2=10

(a) Mode of action of ethylene

(b) Mode of action of cytokinin

UNIT—IV

7. Describe the ATPase chemo-osmotic theory of ATP synthesis with suitable illustration. 10

OR

8. Give brief accounts on : 5×2=10

(a) Cyclic electron transport system

(b) C_2 cycle

UNIT—V

9. Describe the following : 5×2=10

(a) First law of thermodynamics

(b) Concept of free energy

OR

10. Describe the following : 5×2=10

(a) Second law of thermodynamics

(b) Entropy change

★ ★ ★