2025

(CBCS)

(3rd Semester)

BOTANY

THIRD PAPER

(Plant Physiology, Biochemistry and Ecology)

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. The area of young roots where most absorption takes place is

(a) root hair zone ( ) *(b)* root cap ( )

(c) quiescent centre ( ) *(d)* Casparian strip ( )

2. The leaves of C_4 plants possess special anatomy called

(a) Kranz type ( ) *(b)* CAM type ( )

(c) dimorphic ( ) *(d)* succulent type ( )

3. The environment provided by the wet leaf surface for growth of microorganisms is called

(a) canopy ( ) *(b)* rhizosphere ( )

(c) phyllosphere ( ) *(d)* mineral ( )

4. The synthesis of ATP via electron transport system is called

(a) oxidative decarboxylation ( )

(b) cyclic electron transport ( )

(c) non-cyclic photophosphorylation ( )

(d) oxidative photophosphorylation ( )

5. If the day length in the month of September is 12 hours, which type of mature plants have the least chance of flowering between September and December?

(a) Day neutral plants ( )
(b) Short-day plants ( )
(c) Long-day plants ( )
(d) None of the above ( )

6. Which one of the following hastens the ripening of fruits?

(a) Cytokinin ( ) (b) Gibberellin ( )
(c) Ethylene ( ) (d) Auxin ( )

7. The genetic information in the DNA is transferred to a complementary sequence of RNA and the process is called

(a) transcription ( ) (b) replication ( )
(c) translation ( ) (d) termination ( )

8. Which of the following is the most abundant biomolecule on the earth?

(a) Nucleic acid ( ) (b) Protein ( )
(c) Carbohydrate ( ) (d) Lipid ( )

9. The natural place of an organism or a community is known as

(a) niche ( ) (b) biome ( )
(c) habit ( ) (d) habitat ( )

10. The Taj Mahal, Lotus Temple, Golden Temple, India Gate and other famous heritage monuments are being affected by

(a) air pollution ( ) (b) water pollution ( )
(c) noise pollution ( ) (d) All of the above ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 15)

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

UNIT—I

1. Passive and active absorption

OR

2. Structure of stomata

UNIT—II

3. Nitrogen fixation

OR

4. Lock and key mechanism of enzyme action

UNIT—III

5. Seed dormancy

OR

6. Senescence

UNIT—IV

7. Translation

OR

8. Polysaccharides

UNIT—V

9. Food chain

OR

10. Global warming

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following : 10×5=50

UNIT—I

1. What is photosynthesis? Elucidate the mechanism of CAM pathways of carbon fixation. 2+8=10

OR

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

   (a) Micro- and macro-nutrients

   (b) Mechanism of stomatal transpiration

UNIT—II

3. What are enzymes? Give an explanatory note on the mechanism of enzyme action. 2+8=10

OR

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

(a) Glycolysis

(b) Structure of mitochondria

UNIT—III

5. What are plant growth hormones? Give an account on physiological role of ethylene. 2+8=10

OR

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

(a) Phytochrome : structure and function

(b) Photoperiodism

UNIT—IV

7. Illuminate the process of protein synthesis. 10

OR

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

(a) Carbohydrates

(b) DNA replication

UNIT—V

9. What do you mean by pollution? Depict the causes and control of air pollution. 10

OR

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

(a) Abiotic and biotic components of ecosystem

(b) Food web

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