

2024

(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)

Put a Tick (✓) mark against the correct answer in the brackets provided : 1×10=10

1. The difference between free energy of water molecule in pure and in any other system is called
 - (a) enthalpy ()
 - (b) concept of free energy ()
 - (c) entropy ()
 - (d) water potential ()

2. Calvin and Benson studied steps of dark reactions in which green algae?
- (a) Chlamydomonas ()
 - (b) Volvox ()
 - (c) Chlorella ()
 - (d) Spirogyra ()
3. The enzymes which act away from the site of synthesis are known as
- (a) exoenzymes ()
 - (b) endoenzymes ()
 - (c) holoenzymes ()
 - (d) apoenzymes ()
4. The synthesis of ATP via electron transport system is called
- (a) oxidative decarboxylation ()
 - (b) cyclic electron transport ()
 - (c) non-cyclic photophosphorylation ()
 - (d) oxidative phosphorylation ()
5. If the day length in the month of September is 12 hours, which types 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. Okazaki fragments are formed in the
- (a) leading strand ()
 - (b) lagging strand ()
 - (c) RNA transcript ()
 - (d) None of the above ()
9. The term 'ecosystem' was enunciated by
- (a) E. P. Odum ()
 - (b) A. G. Tansley ()
 - (c) G. Mendel ()
 - (d) C. C. Park ()
10. In an ecological succession, the final stable community is known as
- (a) climax community ()
 - (b) ultimate community ()
 - (c) final community ()
 - (d) seral community ()

(SECTION : B—SHORT ANSWERS)

(Marks : 15)

Write short notes on the following :

3×5=15

UNIT—I

1. Stomata

OR

2. Photosynthetic apparatus

UNIT—II

3. Oxidative phosphorylation

OR

4. Structure of mitochondria

UNIT—III

5. Phytochrome

OR

6. Senescence

UNIT—IV

7. Amino acids

OR

8. Polysaccharides

UNIT—V

9. Community

OR

10. Food chain

(SECTION : C—DESCRIPTIVE)

(Marks : 50)

Answer the following questions :

10×5=50

UNIT—I

1. What is photosynthesis? Elucidate the mechanism of C₄ pathway.

2+8=10

OR

2. Write accounts on the following :

5×2=10

(a) Micro- and macro-nutrients

(b) Photorespiration

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) Biological nitrogen fixation

UNIT—III

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

OR

6. Write short notes on the following : 5×2=10
- (a) Vernalization
- (b) Seed dormancy

UNIT—IV

7. Describe the structure and a classification of amino acids. 10

OR

8. Write short notes on the following : 5×2=10
- (a) DNA replication
- (b) Transcription

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) Ecological pyramids
- (b) Abiotic and biotic components of ecosystem

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