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(NEP—2020)

(5th Semester)

BOTANY (MAJOR3/MINOR)

(Plant Physiology)

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. Absorption of water mainly due to transpiration is

- (a) passive absorption ()
- (b) osmotic absorption ()
- (c) non-osmotic absorption ()
- (d) active absorption ()

2. The most abundant element present in plant is

- (a) nitrogen ()
- (b) manganese ()
- (c) iron ()
- (d) carbon ()

3. Which of the following minerals is required for the synthesis of chlorophyll?

- (a) Copper ()
- (b) Potassium ()
- (c) Nitrogen ()
- (d) Magnesium ()

4. The most important product of light reaction of photosynthesis is

- (a) oxygen ()
- (b) NADPH ()
- (c) ATP ()
- (d) All of the above ()

5. Most oxygen in the atmosphere is contributed by plants from

- (a) photosystem ()
- (b) photolysis of water ()
- (c) photorespiration ()
- (d) photooxidation ()

6. The first stable product of C_3 pathway is

- (a) oxaloacetic acid ()
- (b) RuBP ()
- (c) PGA ()
- (d) PGAL ()

7. Krebs cycle takes place in

- (a) mitochondria ()
- (b) cytoplasm ()
- (c) grana ()
- (d) endoplasmic reticulum ()

8. The enzyme for electron transport chain is present in

- (a) cytoplasm ()
- (b) matrix ()
- (c) outer mitochondrial membrane ()
- (d) inner mitochondrial membrane ()

9. Ethylene is employed for

- (a) increasing light ()
- (b) stimulation ()
- (c) ripening ()
- (d) apical dominance ()

10. In higher plants, cell elongation is due to hormone

- (a) florigen ()
- (b) auxin ()
- (c) cytokinin ()
- (d) gibberellin ()

(SECTION : B—SHORT ANSWERS)

(Marks : 15)

Write short notes on *five*, taking at least *one* from each Unit :

3×5=15

2. Antit

UNIT—I

1. Water potential

2. Antitranspirant

(11-711)

4. C/M 1/2

UNIT—II

3. CAM plants

4.

4. Photosystem

UNIT—III

5. Structure of mitochondria

6. Respiration

UNIT—IV

7. Synthetic growth regulators

8. Ethylene

1. Write a balanced chemical equation for the reaction of ethylene with oxygen to form carbon dioxide and water.

2. Write a balanced chemical equation for the reaction of ethylene with hydrogen to form ethane.

3. Write a balanced chemical equation for the reaction of ethylene with chlorine to form 1,2-dichloroethane.

4. Write a balanced chemical equation for the reaction of ethylene with bromine to form 1,2-dibromoethane.

5. Write a balanced chemical equation for the reaction of ethylene with hydrogen bromide to form ethyl bromide.

6. Write a balanced chemical equation for the reaction of ethylene with hydrogen chloride to form ethyl chloride.

7. Write a balanced chemical equation for the reaction of ethylene with hydrogen iodide to form ethyl iodide.

8. Write a balanced chemical equation for the reaction of ethylene with hydrogen sulfide to form ethyl sulfide.

9. Write a balanced chemical equation for the reaction of ethylene with hydrogen cyanide to form acrylonitrile.

10. Write a balanced chemical equation for the reaction of ethylene with hydrogen azide to form ethyl azide.

11. Write a balanced chemical equation for the reaction of ethylene with hydrogen peroxide to form ethyl hydroperoxide.

12. Write a balanced chemical equation for the reaction of ethylene with hydrogen selenide to form ethyl selenide.

13. Write a balanced chemical equation for the reaction of ethylene with hydrogen telluride to form ethyl telluride.

14. Write a balanced chemical equation for the reaction of ethylene with hydrogen stibine to form ethyl stibine.

15. Write a balanced chemical equation for the reaction of ethylene with hydrogen arsenide to form ethyl arsenide.

16. Write a balanced chemical equation for the reaction of ethylene with hydrogen phosphine to form ethyl phosphine.

17. Write a balanced chemical equation for the reaction of ethylene with hydrogen borane to form ethyl borane.

18. Write a balanced chemical equation for the reaction of ethylene with hydrogen fluoride to form ethyl fluoride.

19. Write a balanced chemical equation for the reaction of ethylene with hydrogen chloride to form ethyl chloride.

20. Write a balanced chemical equation for the reaction of ethylene with hydrogen bromide to form ethyl bromide.

21. Write a balanced chemical equation for the reaction of ethylene with hydrogen iodide to form ethyl iodide.

22. Write a balanced chemical equation for the reaction of ethylene with hydrogen cyanide to form acrylonitrile.

23. Write a balanced chemical equation for the reaction of ethylene with hydrogen azide to form ethyl azide.

24. Write a balanced chemical equation for the reaction of ethylene with hydrogen peroxide to form ethyl hydroperoxide.

25. Write a balanced chemical equation for the reaction of ethylene with hydrogen selenide to form ethyl selenide.

26. Write a balanced chemical equation for the reaction of ethylene with hydrogen telluride to form ethyl telluride.

27. Write a balanced chemical equation for the reaction of ethylene with hydrogen stibine to form ethyl stibine.

28. Write a balanced chemical equation for the reaction of ethylene with hydrogen arsenide to form ethyl arsenide.

29. Write a balanced chemical equation for the reaction of ethylene with hydrogen phosphine to form ethyl phosphine.

30. Write a balanced chemical equation for the reaction of ethylene with hydrogen borane to form ethyl borane.

(SECTION : C—DESCRIPTIVE)

(Marks : 50)

Answer *five* questions, taking at least *one* from each Unit :

10×5=50

UNIT—I

1. What is transpiration? Describe the mechanism of stomatal regulation of transpiration. 2+8=10
2. Write short notes on the following : 5×2=10
 - (a) Active and passive absorption of water
 - (b) Deficiency symptoms of N, P, K, B and S

UNIT—II

3. What is photosynthesis? Describe carbon fixation in C₃ plants. 2+8=10
4. Write notes on the following : 5×2=10
 - (a) Photorespiration
 - (b) Photosynthetic apparatus

UNIT—III

5. Give a detailed account on the process of glycolysis. 10
6. Write on the following : 5×2=10
 - (a) Electron transport system
 - (b) Respiratory quotient

UNIT—IV

7. What are plant growth hormones? Describe the physiological roles of auxin and ethylene. 2+8=10
8. Write notes on the following : 5×2=10
 - (a) Role of ABA in stress management
 - (b) Mobilization of endosperm food reserves by gibberellins