63/1 (SEM–5) CC12/BOTHC5126

2023

BOTANY

Paper : BOTHC5126

(Plant Physiology)

Full Marks : 60

Pass Marks : 24

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer : ***(any five)*** 1×5=5

   (a) What will happen to a cell with ψ_w –0.3 *kPa* is put in a solution having ψ_w is –0.9 *kPa*?

   (i) Cell will become turgid

   (ii) Cell will be plasmolysed

   (iii) Cell wall will beak

   (iv) No net changes will occur

(b) Which one of the following factors is responsible for guttation ?

(i) Transpiration

(ii) Imbibition

(iii) Root pressure

(iv) Respiration

(c) Chlorosis in older leaves is due to the deficiency of

(i) Iron

(ii) Phosphorous

(iii) Magnesium

(iv) Boron

(d) During phloem loading in the tissue, which one of the following conditions develops at the phloem tissue ?

(i) Hypertonic

(ii) Hypotonic

(iii) Isotonic

(iv) No change

(e) Which one of the plant hormones is used to kill weeds ?

(i) Ethylene

(ii) ABA

(iii) 2.4-D

(iv) Cytokinin

(f) A seed will germinate when it gets which of the following light condition s ?

(i) Pr + Pfr + Pr

(ii) Pr + pfr + Pr + Pfr

(iii) Blue light

(iv) Continuous illumination

(g) Which one of the following are flowering hormones ?

(i) Florigen and Ethylene

(ii) Dormin and Vernalin

(iii) Vernalin and Florigen

(iv) Both (i) and (ii)

(h) A brief exposure of light in dark period inhibits flowering in

(i) Short day plant

(ii) Long day plant

(iii) Day neutral plant

(iv) All of the above

(i) Which of the following hormones is responsible for fruit ripening?

(i) ABA

(ii) IAA

(iii) Gibberellin

(iv) Ethylene

(j) Brassinosteroids (BRs) play important role in

(i) Cell elongation and root growth

(ii) Immunity and reproduction

(iii) Photomorphogenesis

(iv) All of the above

2. Answer the following questions : ***(any five)*** 2×5=10

(a) What is transpiration? What are its types? 1+1=2

(b) Give the basic difference between symport and antiport. 1+1=2

(c) Give *any two* evidences to support the translocation of food in phloem.

(d) What is Donnan's Equilibrium?

(e) What is critical photoperiod? What would be the condition(s) for short day plant? 1+1=2

(f) Give *any two* conditions because of which seeds remain quiescent.

(g) What are High Irradiance Responses (HIRs)? Give an example. 1+1=2

3. Answer the following questions : ***(any five)*** 5×5=25

Write short notes on :

(a) Root pressure theory

(b) Phloem loading and unloading mechanism

(c) Munch's Mass-flow hypothesis

(d) Commercial uses of ethylene

(e) Bioassay for auxin (*any one* method)

(f) Florigen concept of flowering

Differentiate between :

(g) Transpiration and guttation

(h) Symport, antiport and uniport

(i) Phytochromes and cryptochrome

4. Answer the following questions : ***(any two)*** 10×2=20

(a) Write a detailed note on the most suitable mechanism of water transport that occurs in tall trees.

(b) What are macronutrients ? Write the importance of nitrogen in plant. What are the symptoms associated with its deficiency ? 2+4+4=10

(c) What is indole-3-acetic acid (IAA) ? What role does it play in the growth and development of plants ? Give an example each of a natural and an artificial auxin. 2+6+2=10

(d) What is vernalization ? Describe the mechanism of vernalization. Write *any two* practical applications. 2+6+2=10

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