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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  $\psi_w -0.3 \text{ kPa}$  is put in a solution having  $\psi_w$  is  $-0.9 \text{ kPa}$ ?

- (i) Cell will become turgid
- (ii) Cell will be plasmolysed
- (iii) Cell wall will beak
- (iv) No net changes will occur

Contd.

(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 conditions ?

- (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