Term End External Examination 4th Semester (Session- July 2024)

Subject: Botany

Course No and Title: BOTC3422M/Physiology of Plants

Time: 2.15 hours Max Marks:100 Min. Marks:40

Section A: Objective Type Questions

Q1. Choose the appropriate Answer: (8x1.5=12)

i. The continuous system of cell walls and intercellular spaces in plant tissues is called:

A Symplast **B** Apoplast

C Tonoplast **D** None of these.

ii. Kidney-shaped guard cells are a characteristic of :

A Grasses **B** Dicotyledons

C Non-Grass monocotyledons **D** Dicotyledons and Non-Grass monocotyledons

iii. Necrosis of young meristematic regions like tips of roots and young leaves is associated with the deficiency of:

A Nitrogen **B** Phosphorus

C Calcium **D** Potassium

iv. The movement of products of photosynthesis from mature leaves to areas of growth and storage is called:

A Transport **B** Translocation

C Ascent of Sap **D** None of these.

v. Loss of seed dormancy when their moisture content is reduced by excessive drying is called:

A Ripening **B** After ripening

C Chilling **D** None of these.

vi. Which of the following phytohormones is used to promote initiation and growth of fruits in apple:

A Auxins **B** Gibberellins

C Cytokinins **D** ABA

vii. According to ABC Model for determination of floral organ identity, activity of which organ identity gene specifies carpels:

A Type A **B** Type B

C Type C **D** All of these

viii. The process of promotion of flowering by giving cold treatment to a fully hydrated seed or to a growing plant is called:

A Induction **B** Promotion

C Vernalization **D** Transition

Section-B: Descriptive Type Questions (Short Type)

Q2: Answer all the Questions (8 x 4 =32)

i. Define water potential and name its constituents.

ii. What are anti-transpirants? Give two examples.

iii. Define guttation.

iv. State the criteria of essentiality of mineral elements in plants.

v. Define chemical potential for a solute.

vi. Write the chemical structure of IAA and IBA (natural auxins).

vii. What is photoperiodism?

viii. What is photoreversibility of phytochrome?

Section – C: Descriptive Type Questions (Medium Type)

Answer all the questions: (4 x 7=28)

Q 3. Draw a diagram depicting the pathway of absorption of water from epidermis to endodermis in the root.

OR

Describe briefly the factors which affect transpiration in plants.

Q 4. Write short notes on: (a) Uniport; (b) Co-transport; and (c) Symport.

OR

Describe Pressure-Flow Model of phloem translocation.

Q 5. Write a brief note on physiological role of cytokinins in plants.

OR

What is growth and morphogenesis? Explain briefly hormonal effects on growth and development.

Q6. Define photoperiodism? Explain briefly SDPs, LDPs and Day neutral plants. Give suitable examples.

OR

What are phytochromes? Describe role of phytochromes in flowering.

Section – D: Descriptive Type Questions (Long Type)

Answer any two of the following: (2 x 14=28)

Q7. What is ascent of sap? Explain the Cohesion-Tension Theory of ascent of sap.

Q8. What are essential macro- and micro nutrients found in plants? Describe the biological role of magnesium and calcium in plants.

Q9. What are plant growth hormones? Describe the discovery and physiological role of auxins.

Q10. Describe the discovery and role of cryptochromes in photomorphogenesis.