2024

BOTANY — HONOURS

Paper : DSCC-4

(Plant Anatomy and Embryology)

Full Marks : 75

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer ***any six*** questions from the following : 2×6

   (a) Define Plastochron.

   (b) How Phelloderm is formed?

   (c) Define Apospory and Apogamy.

   (d) What is 'heartwood'?

   (e) Distinguish between leaf trace and leaf gap.

   (f) Distinguish between Apoplast and Symplast.

   (g) Define Apomixis.

   (h) What is Microgametogenesis?

   (i) Distinguish between fascicular and interfascicular cambium.

2. Answer ***any three*** questions from the following : 5×3

   (a) Discuss the types of stomata according to Stebbins and Khush (1961).

   (b) Write a note on the secondary growth found in monocot stem.

   (c) Give an overview of the ultrastructure of the cell wall of vascular plants.

   (d) Write a note on adaptive anatomical features of xerophytes.

   (e) Briefly describe three types of endosperm developments found in angiosperm.

3. Answer ***any four*** questions from the following :

   (a) Write a note on mechanical tissues found in different plant organs. Explain with suitable diagrams the principles governing their distribution in plants. 4+8

   (b) Define stele. Describe different types of stele with examples and diagrams. 1+6+2+3

   (c) Discuss the secondary growth in the stems of *Bignonia* and *Tecoma* with diagrams. Comment on their adaptive advantages. 4+4+4

Please Turn Over

(d) Diagrammatically represent the Korper-Kappe theory in relation to root apex organization. Write the adaptive anatomical features of halophytes. 8+4

(e) What do you mean by 'Dendrochronology'? Discuss, in brief, the different applications of plant anatomy in Systematics and Forensics. 2+5+5

(f) With suitable diagram describe the embryogenesis in *Capsella*. Describe, in brief, the tetrasporic type of embryo sac development. 8+4

2024

BOTANY — HONOURS

Paper : SEC-3

(Plant Tissue Culture and Horticulture Practices)

Full Marks : 75

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group – A

1. Answer ***any two*** of the following questions : 2×2

   (a) How thermolabile components are sterilized in *in vitro* culture?

   (b) What is HEPA? Mention the pore size of HEPA.

   (c) What are meant by PEDC and IEDC?

2. Answer ***any two*** of the following questions : 5×2

   (a) In a flowchart enumerate the steps of artificial seed formation.

   (b) Write down the roles of Plant Growth Regulators in plant tissue culture.

   (c) Write a brief note on micropropagation.

3. Answer ***any three*** of the following questions :

   (a) With suitable flowchart enumerate methods of protoplast isolation, purification and culture. 4+3+5

   (b) What do you mean by secondary metabolite? How secondary metabolites differ from primary metabolites? Give two examples of commercially viable secondary metabolites which are produced through tissue culture methods. Outline the techniques for production of secondary metabolites through tissue culture with special reference to alkaloids. Define terpenes with example. 2+2+2+4+2

   (c) Differentiate between :

      (i) Direct and Indirect organogenesis

      (ii) Caulogenesis and Rhizogenesis

      (iii) Organogenesis and Embryogenesis

      (iv) De-differentiation and Redifferentiation. 3+3+3+3

(d) Write a brief note on suspension culture. What do you mean by somatic embryo? How does it differ from zygotic embryo? Discuss the different developmental stages of somatic embryogenesis. 4+2+2+4

(e) Discuss the different sterilization techniques adopted in plant tissue culture. Mention the detail composition of MS medium. Give a flowchart of haploid culture technique. 4+4+4

Group – B

4. (a) What is pomology? 1

Or,

What is landscape horticulture? 1

(b) What is grafting? Name two plants which are commercially propagated through grafting. 2

Or,

What is bonsai? Give examples of any two important bonsai plants. 2

5. Answer ***any two*** of the following questions : 5×2

(a) Write down the methods and benefits of food processing.

(b) Write a brief note on hydroponics.

(c) Briefly describe any two methods of vegetative propagation of horticultural plants.

6. State the different methods of handling and harvesting of Cut flowers and fruits. Mention the role of horticulture in ecotourism. 7+5

Or,

Mention the scientific name, botanical characters and their economic importance of the followings : 3×4

(i) Papaya

(ii) Potato

(iii) Cauliflower

(iv) Carrot.