

M.Sc Sem-3 Examination

501

Botany

Time : 2-30 Hours]

November-2024

[Max. Marks : 70

Instructions: All Questions carry equal marks
Attempt all Questions

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| Q I | Discuss the structure and function of root anatomy, including the role of root apical meristem (RAM), root hairs, and the overall architecture of roots. | 14 |
| OR | | |
| Q I | A. Compare and contrast heartwood and softwood in terms of their anatomical structure | 7 |
| | B. Describe the function of stomata in gas exchange and water regulation. | 7 |
| Q II | Explain the ABC model of flower development, detailing the roles of the A, B, and C gene classes in determining flower architecture | 14 |
| OR | | |
| Q II | A. Describe sexual incompatibility in detail. | 7 |
| | B. Ultra-structure of Embryo sac | 7 |
| Q III | Discuss the concept of apomixis, its various types, and its potential applications in agriculture. | 14 |
| OR | | |
| Q III | A. Describe how recombinant DNA technology can induce male sterility in plants. | 7 |
| | B. Describe palynology and its significance in environmental studies. | 7 |
| Q IV | Describe the methodologies involved in studying pollen-pistil interactions through temporary preparations along with their significance. | 14 |
| OR | | |
| Q IV | A. Describe the staining process for DNA in plant tissues. | 7 |
| | B. Explain the role of Killing and Fixing for Permanent Preparations in Plant Histology. | 7 |
| Q V | Attempt any 7 out of 12 MCQs/Short question (One- or Two-line answer)/ Fill in the blanks/True or False etc. | 14 |
| 1 | Explain the difference between heartwood and softwood. | 02 |

(P.T.O.)

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| 2 | What are leaf gaps, and why are they important in nodal anatomy? | 02 |
| 3 | Define sexual incompatibility and its significance in plant reproduction. | 02 |
| 4 | What factors can influence the development of the embryo in flowering plants? | 02 |
| 5 | Draw a labelled diagram showing the process of double fertilization in flowering plants. | 02 |
| 6 | Name two extrinsic factors that affect flowering in plants? | 02 |
| 7 | What are the main types of male sterility observed in plants? | 02 |
| 8 | What is aeropalynology, and what types of data does it provide? | 02 |
| 9 | What is the purpose of staining for callose in plant tissues? | 02 |
| 10 | Which stain can differentiate between live and dead plant cells, and how does it work? | 02 |
| 11 | Define immunohistochemistry, and how is it applied in plant research? | 02 |
| 12 | Give two advantages of using fluorescent dyes in staining DNA in plant tissues | 02 |
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