

BOTANY (Paper I)

Time Allowed : Three Hours

Maximum Marks : 300

QUESTION PAPER SPECIFIC INSTRUCTIONS

(Please read each of the following instructions carefully before attempting questions)

There are EIGHT questions divided in two Sections.

Candidate has to attempt FIVE questions in all.

Question Nos. 1 and 5 are compulsory and out of the remaining, any THREE are to be attempted choosing at least ONE question from each Section.

The number of marks carried by a question/part is indicated against it.

Wherever any assumptions are made for answering a question, they must be clearly indicated.

Word limit in questions, wherever specified, should be adhered to.

SECTION 'A'

1. Answer the following in about 150 words each:
 - (a) Give an account of Heterothallism in fungi. 15
 - (b) Describe the process through which the bacterial genes are transferred from one bacterium to another by the viruses. 15
 - (c) Comment on Heterospory in Pteridophytes and its evolutionary significance. 15
 - (d) How would you test the clonal fidelity of the micropropagated plants? Describe. 15
2.
 - (a) Discuss ecological significance of Lichens. 20
 - (b) Distinguish clearly between Keratinophilic and Thermophilic fungi. 20
 - (c) Draw labelled diagrams of transverse and longitudinal sections of sporocarp of Marsilea. 20
3.
 - (a) What are somaclonal variations? How are these utilized for crop improvement? 20
 - (b) What is the importance of *Bacillus thuringiensis* in the current efforts to raise crop productivity? 20
 - (c) Write a note on *Psilotum* as a living fossil. 20
4.
 - (a) Differentiate the archegonium of *Funaria* from that of *Anthoceros*. 20
 - (b) With suitable examples, briefly describe the microbial processes occurring in the rhizosphere which help in plant growth. 25
 - (c) Five different types of spores are produced by the rust fungi. Mention their names and their salient points of distinction from each other. 15

SECTION 'B'

5. Answer the following in about 150 words each:
 - (a) Origin of angiosperms from gymnosperms is suggested on the basis of vessels. Give your critical comments. 15
 - (b) Describe the development of pollen exine and point out the role of sporopollenin. 15
 - (c) Name five edible oil yielding plants. Give their botanical names and families. 15
 - (d) Describe the fructification in *Williamsonia*. 15
6.
 - (a) With the help of labelled diagrams, compare the female gametophyte of *Cycas* with that of *Gnetum*. 20

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| | (b) | What are the changes that occur during the conversion of sapwood into heartwood? Which is more durable – sapwood or heartwood, and why? | 20 |
| | (c) | Discuss whether the angiosperms are monophyletic or polyphyletic. | 20 |
| 7. | (a) | Give an account of the main events in the differentiation of a tracheary element. | 20 |
| | (b) | Give the botanical names of the plant species, their families, part used and the uses of annatto and haematoxylin. | 20 |
| | (c) | Define agamospermy. What is its significance in crop improvement? | 20 |
| 8. | (a) | Describe the structure and function of synergids in angiosperms. | 20 |
| | (b) | With suitable examples, enumerate the floral characteristics of bird pollinated trees. | 20 |
| | (c) | Compare the androecium in the following groups of families: (i) Malvaceae and Fabaceae (ii) Asclepiadaceae and Asteraceae (iii) Solanaceae and Brassicaceae | 20 |