BOTANY

PAPER—I

Time Allowed : Three Hours

Maximum Marks : 200

QUESTION PAPER SPECIFIC INSTRUCTIONS

Please read each of the following instructions carefully before attempting questions

There are EIGHT questions in all, out of which FIVE are to be attempted.

Question Nos. **1** and **5** are compulsory. Out of the remaining SIX questions, THREE are to be attempted selecting at least ONE question from each of the two Sections A and B.

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

Neat sketches may be drawn, wherever required.

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

Answers must be written in ENGLISH only.

SECTION—A

1. *(a)* Explain the role of bacterial cell wall in protecting against lysis and how this role may be experimentally demonstrated. 5+3=8

(b) Define mycoplasma. Explain its structure. Give symptomatology and control measures of little leaf disease of brinjal. 2+2+2+2=8

(c) What are cyanobacteria? Write an account on their cell structure. How do they contribute to the soil fertility? 2+3+3=8

(d) Describe the LS of male cone of Pinus. Add a note on the germination of its pollen grains. 5+3=8

(e) Describe each of the following plasmids and their importance :

(i) F-factor

(ii) R-factor

(iii) Col plasmid 3+3+2=8

2. *(a)* Explain the process of infection by pathogenic fungi. 15

(b) Define the term 'contagium vivum fluidum'. Who coined this term? Differentiate TMV from that of T_4 phage in terms of morphology and nuclear content. 3+2+5+5=15

(c) Differentiate a rust fungus from that of a smut fungus in their symptoms and spore morphology. 5+5=10

3. *(a)* Give an account on the sporocarp of Marsilea. Explain the laminar or leaf segment hypothesis of its evolution. 7+8=15

(b) Differentiate between the enzymes and toxins produced by phytopathogenic microorganisms. Write an account on industrial production of penicillin. 6+9=15

(c) Gnetales is considered to be the most advanced among gymnosperms. Substantiate. 10

4. *(a)* What is an ovule? Describe its structure and types. 2+4+4=10

(b) How would you differentiate between the early and late blight diseases of potato? Mention the pathogens involved and the control measures practiced. 9+2+4=15

(c) Define mycorrhiza. Differentiate between ecto- and endo-mycorrhiza. Elaborate the significance of ecto-mycorrhiza in coniferous forestry programmes. 2+4+4+5=15

SECTION—B

5. *(a)* Give an account of Bentham and Hooker system of classification. In spite of so many latest classifications, why do people still prefer to use this system of classification? 5+3=8 *(b)* How are protoplasts isolated? Describe the methods of protoplast culture. 4+4=8

(c) Define endosperm. With suitable diagrams, describe various types of endosperms based on development. 2+6=8

(d) What is self-incompatibility? Discuss its importance in seed formation. 4+4=8

(e) Illustrate the floral characters of Cucurbitaceae family. Give floral diagram and floral formula. 4+2+2=8

6. *(a)* What is ethnobotany? Highlight its relevance to rural population in India. 2+8=10

(b) Distinguish among differentiation, dedifferentiation and redifferentiation. 5+5+5=15

(c) What are mycotoxins? How do the aflatoxins affect cattle, poultry and human beings? 3+4+4+4=15

7. *(a)* Summarize the role of protoplast fusion in somatic hybridization. 10

(b) Write the botanical names, family and uses of the following :

(i) Asafoetida

(ii) Black pepper

(iii) Ginger

(iv) Coriander

(v) Fennel 3×5=15

(c) Enumerate the process of herbarium preparation and add a note on its significance. Mention any two Indian herbaria of national importance. 10+3+2=15

8. *(a)* Illustrate the anatomy of C_4 plants. How do they differ from C_3 plants? 15

(b) Mention the botanical names with family of plants yielding the following. For each product, give examples of two plants :

(i) Narcotics

(ii) Insecticides

(iii) Dyes

(iv) Timber

(v) Fibre 3×5=15

(c) How would you distinguish the anomalous secondary thickening from normal secondary thickening? Describe the anomalous secondary thickening in Dracaena. 5+5=10

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