

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.*

*Questions no. **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.*

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.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Neat sketches may be drawn, wherever required.

*Answers must be written in **ENGLISH** only.*

SECTION A

- Q1.** (a) Give two examples where microbes have helped in controlling soil and water pollution and mention how. 8
- (b) What are phytotoxins and phytoalexins ? Discuss the role they play in plant pathogenesis. 4+4=8
- (c) Give a brief account of structure and function of heterocyst. 5+3=8
- (d) Briefly discuss the morphological and anatomical features of sporogonium of *Marchantia*. 4+4=8
- (e) List five angiosperm-like features of *Gnetum*. However, justify its inclusion in gymnosperms. 5+3=8
- Q2.** (a) Describe with the help of labelled diagrams the structure of *Funaria* capsule. 10
- (b) Briefly discuss the stelar system in Pteridophytes. 15
- (c) (i) Elaborate with two examples, one each from bacteria and fungi, where they have helped in establishing a pharma industry.
- (ii) What are mycoplasma and how are these different from bacteria and fungi ? 10+5=15
- Q3.** (a) Discuss with one example of each, how plants acquire resistance against plant pathogens : 5+5+5=15
- (i) Artificial inoculation with microbes
- (ii) Treatment with chemicals
- (iii) Genetically engineered disease-resistance
- (b) Describe the structure and development of male gametophyte in *Cycas* with the help of diagrams. Put an explanatory note on its unique features. 15
- (c) Discuss in brief, with one example of each, haplo-diplontic and triphasic life cycle in Algae. 5+5=10

- Q4.** (a) (i) What are plantibodies and what is their role in immunization of plants against plant pathogens ?
- (ii) Explain the role of at least two enzymes in the development of plant diseases. 7+8=15
- (b) (i) Describe with the help of diagram, the disease cycle of *Phytophthora infestans*.
- (ii) Briefly discuss the fruiting bodies of *Agaricus*.
- (iii) Comment on the structure and composition of lichen thallus. 5+5+5=15
- (c) Describe the features of Bennettitalean flower with the help of diagram. 5+5=10

SECTION B

- Q5.** (a) State five salient features of Poaceae. Give the binomial of any three economically important plants belonging to this family. 5+3=8
- (b) Discuss the types of tapetum found in anther and explain its functions. 8
- (c) Mention the botanical name, family, and morphology of the useful part in any four fibre producing plants. 8
- (d) What is symmetry ? Discuss briefly the various types of symmetries found in plants. 8
- (e) Discuss APG IV system of classification. 8
- Q6.** (a) Anatomical data of plants are useful in solving many taxonomic problems. Elucidate with at least three examples. 5+5+5=15
- (b) With suitable example and diagram, explain abnormal secondary growth due to the formation of accessory cambial rings. 10
- (c) Describe in brief various procedures for isolation and fusion of protoplasts in plants. Comment on the usefulness of this technology in plant development. 5+5+5=15
- Q7.** (a) Compare the androecium in Orchidaceae and Asclepiadaceae. 10
- (b) Differentiate between gums, resins and dyes. Give the binomial, family and morphology of the useful parts of two plants from each of the above categories. 3+12=15
- (c) Define apomixis and discuss in brief the types, causes and its significance. 15

- Q8. (a) With the help of diagrams, describe the leaf anatomy of C₄ plants. How does the anatomy of C₄ plants differ from the anatomy of C₃ plants? 10
- (b) How many types of embryo development occur in dicot plants? Discuss in detail the embryo development in *Capsella bursa-pastoris*. 5+10=15
- (c) (i) Give a brief account of usefulness of biofuels as compared to fossil fuels.
- (ii) Discuss in brief any two energy plants. How will they be useful in the economy of a country? 8+7=15

