

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.

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

Neat sketches may be drawn, wherever required.

- Q1.** (a) What are the major differences between Moss and Liverworts ? 8
- (b) What are Biocides ? Describe their merits and demerits. 2+3+3=8
- (c) Blue-green algae are also referred to as bacteria. Explain their algal and bacterial features. 8
- (d) Give the scientific name of the organisms used for the production of : 2×4=8
- (i) Ethyl alcohol from glucose
- (ii) Citric acid
- (iii) Bacitracin
- (iv) Cellulase
- (e) Name the order of Gymnosperms whose members are known as “SEED FERNs”. Give its general characteristics. 2+6=8
- Q2.** (a) Describe the ecological and horticultural applications of Bryophyta. 5+5=10
- (b) Draw and label the thallus structure of *Laminaria*. Describe the sexual reproduction in *Laminaria*. 5+10=15
- (c) Describe the structure of female gametophyte of *Cycas*. Explain the changes in the ovule of *Cycas* after fertilization. 7+8=15
- Q3.** (a) Differentiate between Gymnosperms and Angiosperms with reference to their vasculature, fertilization, reproductive structures and seed. 10
- (b) Name the causal organism of Leaf spot or Tikka disease of groundnut. What are the symptoms of this disease ? Describe its disease cycle and management. 2+3+5+5=15
- (c) Describe the major characteristics of Ophioglossaceae. Draw and describe the development of spike and sporangium in *Ophioglossum*. 5+10=15
- Q4.** (a) Describe the role of fungal enzymes and toxins in the development of plant diseases. 5+5=10
- (b) What are the salient features of Zygomycetes ? With the help of suitable diagrams, describe the sexual reproduction in *Mucor*. 5+10=15
- (c) What is the difference between Manoxylic and Pycnoxylic wood ? Draw well-labelled diagrams of Radial longitudinal section and Tangential longitudinal section of long shoot of *Pinus*. 5+10=15

SECTION B

- Q5.** (a) Write short notes on the following : 4+4=8
- (i) Adventive embryony
 - (ii) Haploid parthenogenesis
- (b) Explain successive stages in the development of male gametophyte in angiosperms. 8
- (c) Explain the concept of cellular totipotency in plants. How is this property utilized in plant tissue culture ? 4+4=8
- (d) Write the botanical names of any two dye-yielding plants with family and mention the plant parts from where the dyes are obtained. 4+4=8
- (e) What is Herbarium ? How does it act as a source of information for plants ? Differentiate between herbarium and virtual herbarium. 2+4+2=8
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- Q6.** (a) Draw and explain anomalous secondary growth in *Boerhavia diffusa* and *Salvadora* sp. 5+5=10
- (b) Describe the floral characters, and draw floral diagrams and floral formulae of subfamilies Papilionaceae, Caesalpinieae and Mimoseae of family Fabaceae. 5+5+5=15
- (c) Mention the botanical name, family with morphology of the parts used for the following : 3×5=15
- (i) Fig
 - (ii) Tea
 - (iii) Oats
 - (iv) Oil palm
 - (v) Clove

- Q7.** (a) Write an account on ethnobotanical research in India. 10
- (b) Describe the androecium of the following families and give their floral formulae : 5×3=15
- (i) Malvaceae
 - (ii) Brassicaceae
 - (iii) Orchidaceae
 - (iv) Asclepiadaceae
 - (v) Verbenaceae
- (c) “Plant tissue culture technology can be utilized to save endangered and threatened plants.” Substantiate the statement. 15
- Q8.** (a) Why are botanical gardens considered as “outdoor laboratories” ? 10
- (b) Write an account on cell suspension culture. What are its applications ? 10+5=15
- (c) How are protoplasts utilized to obtain hybrids with potential agronomic value ? Give two examples. 10+5=15