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.

SECTION A

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*

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*