

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. Answer the following keeping your answers brief and to the point : **8×5=40**

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| (a) | Distinguish between Prokaryotes and Eukaryotes. | 8 |
| (b) | What is Aflatoxin ? State its importance. | 8 |
| (c) | Explain the pigments observed in Rhodophyceae. | 8 |
| (d) | Discuss Ammonification, Nitrification and Denitrification, stating the names of bacteria responsible for each step. | 8 |
| (e) | Explain the developmental stages of <i>Pinus</i> male gametophyte. | 8 |

- Q2.** (a) Describe Algal Phylogeny. 10
- (b) Describe sporophyte development in bryophytes with suitable illustrations. 10
- (c) Discuss the molecular basis of plant-pathogen interaction, with examples. 10
- (d) Describe the role of bacteria in pharmaceuticals, agriculture and industry. 10
- Q3.** (a) Distinguish between Simple and Cleavage Polyembryony. With the help of labelled diagrams, compare the embryogeny of *Pinus* and *Cycas*. 10
- (b) Enumerate the sporophytic and gametophytic features of *Psilotum*. Comment on its systematic position. 10
- (c) Discuss the role of transduction in genetic recombination in bacteria. 10
- (d) Characterize the different types of Mycorrhiza with examples. Discuss its role in agriculture and forestry. 10
- Q4.** (a) Define Telome. Discuss Zimmermann's telome concept citing examples from major pteridophytic groups. 10
- (b) Describe briefly the symptoms and control measures of black stem rust of wheat. Name the causal organism. Why is it known as macrocyclic rust? 10
- (c) Distinguish between Lytic and Lysogenic cycles. Explain briefly the steps of multiplication process of T4-bacteriophage by lytic cycle. 10
- (d) Discuss the role of amphibious plants in the evolution of land plants. 10

SECTION B

- Q5. Answer the following keeping your answers brief and to the point :** **8×5=40**
- (a) Explain with examples, the different provisions of author citations. 8
 - (b) Discuss Vavilov's Centres of diversity. 8
 - (c) Give five botanical names of fibre yielding plants and mention the parts from where fibres are obtained. 8
 - (d) Discuss in brief, the distinctive flora of the Mesozoic Era. 8
 - (e) Give a concept on the Inflorescence of Musaceae. 8
- Q6.**
- (a) Discuss the basic outline of classification according to the principles of Bentham and Hooker. State its merits and demerits. 6+4=10
 - (b) Compare the floral characteristics of Fabaceae and Asclepiadaceae. Give floral diagrams and name an economically important plant of each of these families. 6+2+2=10
 - (c) What do you mean by Palynology ? Give an account of application of palynology. 2+8=10
 - (d) Define Ethnobotany. Describe the role of ethnobotany in the discovery of modern drugs, citing examples. 1+9=10
- Q7.**
- (a) Write the botanical names, active constituents and uses of five plants of economic importance belonging to each of the families Fabaceae, Rosaceae and Brassicaceae. 15
 - (b) Discuss the different levels of biodiversity. Comment briefly on *in situ* and *ex situ* conservation of biodiversity. State the role of cryopreservation in the conservation of plant biodiversity. 6+5+4=15
 - (c) What is Apomixis ? Discuss different apomictic developmental pathways with suitable illustrations. Give a note on genetics of apomixis. 1+5+4=10

- Q8.** (a) What is meant by Anomalous Secondary Growth ? Give a descriptive account on comparison of normal and anomalous secondary growth in dicot with examples and illustrations, wherever necessary. $2+13=15$
- (b) Define Botanical Garden and state how it differs from other gardens. Name two internationally reputed botanical gardens. Discuss the role of an ideal botanical garden in education. $2+2+6=10$
- (c) Write notes on the following : $5 \times 3 = 15$
- (i) Micropropagation : Definition, stages and application 5
 - (ii) Callus Culture : Origin and application 5
 - (iii) Protoplast Fusion : Origin, merits and demerits 5