

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 : 5×8=40

- (a) Comment on the characteristics of Archaea, Bacteria and Eukarya. 5
- (b) Explain the following steps of Nitrogen fixation and name the bacteria involved in each process : 5

Ammonification, Nitrification and Denitrification

- (c) With the help of graphic presentation, explain the Isomorphic and Heteromorphic life cycle. 5

- (d) Draw well-labelled floral diagrams of a pentamerous actinomorphic flower showing the following conditions of stamens : 5
Obdiplostemonous and pseudo-obdiplostemonous conditions of stamens, each one in a separate floral diagram.
- (e) Discuss briefly the *Inter-situ*, *Ex-situ* and *In-situ* conservation. 5
- (f) "India is a top megadiverse country with 2 hottest Hot spots out of 25 Hot spots." Justify the statement. 5
- (g) Describe the economic importance of Gymnosperms. 5
- (h) Discuss the morphological nature of sporocarp of *Marsilea*. 5
- Q2.** (a) Write a detailed note on sustainable utilization of Bioresources and ecosystem research. 15
- (b) Explain the mode of virus infection in T-even phage and Lambda (λ) phage. 15
- (c) Explain the main steps of "Telome theory". 10
- Q3.** (a) Describe the role of bacteria in agriculture, medicine and industry. 12
- (b) "Vessels of *Gnetum* are different from the vessels of Angiosperms in origin." Explain critically. 10
- (c) "All viruses are constructed according to geometrical rules of symmetry." Explain critically. 10
- (d) Give the name of the causal organism, symptoms and measures to control a plant disease caused by a bacterium. 8
- Q4.** (a) Describe the range of thallus structures in Lichens. Lichens are rare or absent in cities. What conclusion can be drawn from this ? 15
- (b) Explain the morphological nature of ovuliferous scale of *Pinus*. 10
- (c) Discuss briefly the distribution of Cryptogams in India and their economic potential. 15

SECTION B

Q5. Answer the following keeping your answers brief and to the point : 5×8=40

- (a) Distinguish between the following : 5
- (i) Rust and Smut
 - (ii) Cladode and Phyllode
- (b) Differentiate between the following : 5
- (i) Isokont and Heterokont
 - (ii) Centric and Eccentric growth rings
- (c) Draw well-labelled diagrams of the following : 5
- (i) Flower showing androphore and gynophore
 - (ii) Winged pollen of *Pinus*
- (d) Distinguish between the following : 5
- (i) Monoxyle and Pycnoxylic stem
 - (ii) Medullary and Cortical vascular bundles
- (e) Differentiate between the following : 5
- (i) Descending and Ascending imbricate aestivation
 - (ii) Hypanthium and Hypanthodium
- (f) Draw well-labelled diagrams of the following : 5
- (i) Male flower of *Euphorbia*
 - (ii) Tyloses
- (g) Discuss briefly the following : 5
- (i) Taxonomic position of Caytoniales
 - (ii) Peristome teeth of *Funaria*
- (h) Explain briefly the following : 5
- (i) Coenocytic mycelium
 - (ii) Parasitism in fungi

Q6. Write about the following :

- (a) Explain the progressive sterilization of the sporogenous tissue in Bryophytes. 20
- (b) Theory of Endemism 10
- (c) Taxonomic Hierarchy 10

- Q7.**
- (a) 'Ranalisma' forms a connective link between Dicotyledons and Monocotyledons. Discuss it critically. 15
 - (b) Describe the various stages of development of exine of pollen wall. Add a note on the importance of sporopollenin. 15
 - (c) South Pacific Ocean is considered as the "Cradle home of primitive vesselless Angiosperms". Write the names of such plants. 10

- Q8.**
- (a) Draw the ultrastructural diagram of Heterocyst. 8
 - (b) Draw the floral diagram of *Orchid* of Monandrae group. 8
 - (c) Write notes on the following : 6×4=24
 - (i) Totipotency 6
 - (ii) Cybrids 6
 - (iii) Symmetry and differentiation 6
 - (iv) Apomixis 6