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:

   Ammonification, Nitrification and Denitrification 5

(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: 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.

(f) “India is a top megadiverse country with 2 hottest Hot spots out of 25 Hot spots.” Justify the statement.

(g) Describe the economic importance of Gymnosperms.

(h) Discuss the morphological nature of sporocarp of Marsilea.

Q2. (a) Write a detailed note on sustainable utilization of Bioresources and ecosystem research.

(b) Explain the mode of virus infection in T-even phage and Lambda (λ) phage.

(c) Explain the main steps of “Telome theory”.

Q3. (a) Describe the role of bacteria in agriculture, medicine and industry.

(b) “Vessels of Gnetum are different from the vessels of Angiosperms in origin.” Explain critically.

(c) “All viruses are constructed according to geometrical rules of symmetry.” Explain critically.

(d) Give the name of the causal organism, symptoms and measures to control a plant disease caused by a bacterium.

Q4. (a) Describe the range of thallus structures in Lichens. Lichens are rare or absent in cities. What conclusion can be drawn from this?

(b) Explain the morphological nature of ovuliferous scale of Pinus.

(c) Discuss briefly the distribution of Cryptogams in India and their economic potential.
Q5. **Answer the following keeping your answers brief and to the point:** $5 \times 8 = 40$

(a) Distinguish between the following:
   (i) Rust and Smut
   (ii) Cladode and Phyllode

(b) Differentiate between the following:
   (i) Isokont and Heterokont
   (ii) Centric and Eccentric growth rings

(c) Draw well-labelled diagrams of the following:
   (i) Flower showing androphore and gynophore
   (ii) Winged pollen of *Pinus*

(d) Distinguish between the following:
   (i) Monoxylic and Pycnoxylic stem
   (ii) Medullary and Cortical vascular bundles

(e) Differentiate between the following:
   (i) Descending and Ascending imbricate aestivation
   (ii) Hypanthium and Hypanthodium

(f) Draw well-labelled diagrams of the following:
   (i) Male flower of *Euphorbia*
   (ii) Tyloses

(g) Discuss briefly the following:
   (i) Taxonomic position of Caytoniales
   (ii) Peristome teeth of *Funaria*

(h) Explain briefly the following:
   (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 Monandraceae group. 8
(c) Write notes on the following: 6x4=24
   (i) Totipotency 6
   (ii) Cybrids 6
   (iii) Symmetry and differentiation 6
   (iv) Apomixis 6