

# IAS Mains Botany 1991

## Paper-I

### Section A

1. Answer any three of the following parts. Answer should not exceed 200 words for each:
  - a. List the structural characteristics of the cyan bacteria. What are they included under the kingdom Monera and not in the kingdom Plantae?
  - b. Outline a method by which water pollution can be controlled by bacteria.
  - c. discuss the difference between a lysogenic and lytic pathway of multiplication of bacteriophages inside the host cell.
  - d. Explain the difference between active and passive immunity.
2. Answer the following questions
  - a. Name the causal agent, two characteristic symptom expression of the following plant disease:
    - i. Bunchy top of banana (*Musa* sp.)
    - ii. White rust of mustard (*Brassica campestris* L.)
    - iii. Citrus canker (*Citrus aurantifolia* Swingle) also (*C. Sinensis* (L.) Osbeck)
    - iv. Yellow rust of wheat (*Triticum vulgare* Host)
    - v. root-knot of potato (*Solanum tuberosum* L.)
  - b. Explain the concept of physiology of parasitism by suitable examples.
3. Answer the following questions
  - a. Discuss the adaptations for land life evident in the bryophytes.
  - b. Give a schematic representation of the life cycle of moss (no details are necessary) and explain the existence of alternation of generations. How have experimental studies modified our understanding of the alternation of generations?
  - c. Draw the structure of a vegetative cell of yeast (*Scharomyces cervisiae*). Explain the economic importance of yeast.
  - d. In what ways is chara unique among the algae?
4. Discuss the resemblances and differences in the structure of *Selaginella* and *Lycopodium*.

### Section B

5. Answer any three of the following parts. Answer should not exceed 200 words for each:
  - a. Explain methods of proving that a plant is an apomict and capable of inducing parthenocarpy.
  - b. Which characteristics of flowers are considered to be evolutionarily advanced and which are considered to be primitive?

c. Write briefly about the following:

- i. Casparian band
- ii. Explain the differences in the functional leaf anatomy of C<sub>3</sub> and C<sub>4</sub> plants
- iii. Pollen as allergens
- iv. Fusiform initials and ray initials

d. Explain very briefly the economic importance of

- i. Euphorbiaceae
- ii. Compositae
- iii. Gnetales
- iv. Coconut palm

6. Answer the following questions

- a. What is totipotency? Discuss the significance of regenerating plants from single cells or protoplasts under aseptic conditions.
- b. Explain the advantages of micropropagation using the plant tissue culture methodology.

7. Selecting suitable examples from gymnosperms, explain the following conditions and their significance.

- a. Dioecism
- b. Flagellated sperm
- c. Pollination droplet
- d. Cleavage polyembryony
- e. Evergreen foliage

8. Write short notes on the following terms, citing the genus and the family (angiosperm) in which these are found:

- a. Pollinium
- b. Capitulum
- c. Cyathium
- d. Bicollateral vascular bundles
- e. Pome