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## IAS Mains Botany Papers 1990

### IAS Mains Botany 1990

#### Paper-I

#### Section A

1. Answer any three of the following question. Answer to parts (b) (c) , and (d) should not exceed 200 words for each:
  - a. Write briefly about the following:
    - i. A vascular land plant more primitive than rhynia
    - ii. A plant disease beneficial to man
    - iii. An edible alga grown commercially by sea-farming
    - iv. A bacterium commercially exploited for antibacterial drug production.
    - v. A carnivores fungus.
  - b. Distinguish between 'virus' and 'viroids' with suitable examples.
  - c. What are monoclonal antibodies? How are they produced? Mention their importance.
  - d. What are Target-specific fungicides? Name three such fungicides and mention their modes of action.
2. Answer the following questions
  - a. Comment on any two of the following:
    - i. Generalized and specific transduction

- ## Section B

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- b. Comment on the floral structure, relationships, and economic importance of Ephedra.
  - c. Distinguish between the cellular and helobial endosperm development with sketches and examples.
  - d. What are somatic hybrids? How are they produced? Mention their importance to mankind with suitable examples.
2. Answer the following questions
  - a. Enumerate the families of Coniferales giving characteristic features, distribution and Indian examples of each of them.
  - b. What is numerical taxonomy? Briefly state the methods employed in and importance of this taxonomy.
3. Answer the following questions
  - a. Answer any two of the following:
    - i. Outline the salient features of the classification by Bentham and Hooker. What are the merits and demerits of this system?
    - ii. Briefly comment on the origin of angiosperms.
    - iii. Importance of the study of photochemistry in taxonomy.
  - b. Answer the below questions
    - i. State the distinguishing characters of Rosaceae and the affinities of the taxon with Ranunculaceae and Leguminosae. Mention five Indian fruit plants of the family.
    - ii. Describe the shoot apex organization of angiosperms in the light of recent researches.
4. Answer the following questions
  - a. Place the following genera to their respective families and indicate their economic importance:
    - i. Elaeis
    - ii. Manihot
    - iii. Arachis
    - iv. Cephalelis
    - v. Nigella
  - b. Distinguish between:
    - i. Cereals and millets
    - ii. Ornithophily and chiropterophily
    - iii. Utricularia and Aldrovanda
    - iv. Plasmodesmata and Ectodermata
    - v. Sorosis and Syconus.

## Paper-II

### Section A

1. Answer any three of the following in not more than 200 words each:
  - a. What are peroxisomes and glyoxysomes? Present brief account of their functions in the light of modern work.
  - b. Define epistasis. Explain the pattern of interactions involved with a suitable example.
  - c. Briefly describe the cloning of eukaryotic genes in E. Coli.
  - d. Discuss the structure and importance of polyploid chromosome in the study of gene regulation.
2. Answer the following questions
  - a. Write a short account on male sterility and its significance in plant breeding.
  - b. Mention the condition required to maintain the Hardy-Weinberg equilibrium over several generations. How does the equilibrium get altered by a change in these conditions?
3. Give the characteristics that a substance must possess to be a hereditary carrier. Discuss the role of genetic code in eukaryotic protein synthesis.
4. Answer any two of the following:
  - a. Explain gene evolution by mutation through duplication.
  - b. Discuss the significance of cytoplasmic inheritance and its importance in hybridization.
  - c. Present critical evidences for the concept of organic evolution.

### Section B

1. Answer any three of the following in not more than 200 words each:
  - a. What is photosystem II? Discuss the structure and function.
  - b. Describe mitochondrial electron transport chain and its relation of oxidative phosphorylation.
  - c. Give the modern concept of the mechanism of stomata opening and closure.
  - d. Discuss the hormonal control of seed dormancy and germination.
2. What is C<sub>4</sub> photosynthesis? In what groups of plants does this occur? Explain its high efficiency with special reference to productivity.
3. Answer any two of the following:
  - a. Forest types of India
  - b. The role of micronutrient elements in plant nutrition with particular reference to zinc and manganese.
  - c. Action of phytohormone in the physiology of flowering.
4. Answer the following questions

- a. Write briefly about the conservation of ecosystems.
- b. Give complete botanical names of the following plants, the family to which they belong, the morphological nature of the parts yielding the economic products and their uses:
  - i. Jute
  - ii. Saffron
  - iii. Teak
  - iv. Rubber
- c. discuss in brief the major centers of origin of cultivated plants in the world with particular references to origing of wheat.