

IAS Mains Botany 1991

Paper-II

Section A

1. Answer any three of the following in not more than 200 words for each part:
 - a. Gives evidence for the correlation of cytological crossing over genetic recombination.
 - b. How do you distinguish between DNA polymerase, RNA polymerase and reverse transcriptase? What are their products?
 - c. Describe the ultra structure and function of endoplasmic reticulum.
 - d. What are aneuploids? How do they originate? Give suitable examples and explain their significance.
2. Answer the following questions
 - a. What is meant by gene amplification? Discuss giving examples.
 - b. Highlight the most important principles employed in plant breeding.
3. Write a critical essay on the principal modes of gene transfer in bacteria.
4. Answer any two of the following:
 - a. What are polar mutations? Discuss their role and significance.
 - b. Examine the concept of gene pool in relation to evolution in natural populations.
 - c. Discuss the principal theories regarding organic evolution.

Section B

5. Answer any three of the following in not more than 200 words for each part:
 - a. What is light harvesting Complex? Explain its role in relation to the function of Reaction Centre.
 - b. Define senescence. Discuss the various types of senescence and their role in plant development.
 - c. Explain the physiology and biochemistry of guard cell function.
 - d. How are fats converted to carbohydrates in plants? Explain the uniqueness of the pathway.
6. Present a brief essay on the diversity in photosynthetic carbon reduction and the role of different modes in adaptation to environment.
7. Answer any two of the following:
 - a. What is social forestry? Explain its principles and practice.
 - b. Briefly describe the concept of community in relation to its dynamics.
 - c. Discuss the mechanism of transport of organic solutes in phloem.

- a. What is Biosphere? What is its main subdivision? Explain the concepts of matter and energy in the functioning of the biosphere.
- b. Give complete botanical names of the following plants their products, their families, the morphological natures of the part and the uses in each case
 - i. Safflower
 - ii. Citronella
 - iii. Cloves
 - iv. Tea
- c. What are plant indicators? Give a brief account of their usefulness with specific examples.