

# IAS Mains Agriculture 1996

## Paper-II

### Section A

1. Answer any three of the following in about 200 words each:
  - a. What are the factors that influence enzymatic reactions? Explain with suitable examples.
  - b. White fruit colour in summer squash is dependent on a dominant allele (W), and coloured fruit on the recessive allele (w). In the presence of w and a dominant gene (G), the colour is yellow, but when G is absent (i.e., gg), the colour is green. Give the F<sub>2</sub> phenotypes and proportions that are expected from crossing a white-fruited (WWGG) with green-fruited (wwgg) plant.
  - c. What is hybridisation? Briefly describe various steps involved in crop improvement by hybridisation.
  - d. Explain the internal and external factors that favour following:
2. Answer the following questions
  - a. Discuss the success/failures of Green Revolution
  - b. Comment upon fossil energy, fixation of energy and biomass.
3. Answer the following questions
  - a. What are the components of cytoplasm? Give their functions.
  - b. Answer the questions
    - i. Discuss passive and active uptake of nutrients by plants.
    - ii. Discuss the principles of breaking seed dormancy.
4. Write short notes on:
  - a. Embryo-rescue
  - b. ATP
  - c. Photorespiration
  - d. Polyploidy
  - e. IPR
  - f. Biodiversity

### Section B

5. Answer/comment upon any three of the following in about 200 words each:
  - a. What is the role of seed born infection in epiphytotics? Give examples in support of your answer.
  - b. Describe the role of organic functional groups found in pesticidal molecules.

- c. Enumerate 10 most important differences between prokaryotes and eukaryotes. List five diseases of national importance caused by organisms in each of above two groups and mention their hot spots in India.
- d. What are pheromones? How do they affect behaviour of insects?

6. Answer the following questions

- a. Describe the Puccinia path in relation to the management of wheat rusts through deployment of host resistant genes.
- b. Discuss the advantages of alternation of generations in-aphids.

7. Answer the following questions

- a. What is the mode of action of Bacillus thuringiensis endotoxin? Give a critical account of its exploitation in the control of insect pests in field crops.
- b. Comment upon fruits as a major export earning product.
- c. How is agricultural productivity affected by cropping pattern in relation to different soils in India.
- d. Enumerate the agro-ecological zones of India.

8. Comment upon:

- a. Role of vegetables in human nutrition.
- b. Strategy for increasing food production in India.
- c. Growing export opportunities of floriculture.