

# IAS Mains Agriculture 1990

## Paper-II

### Section A

1. Answer any three of the following in not more than 200 words each:

- a. What are mutations? How do they occur? Comment upon the significance of induced mutations for improving crops of economic importance.
- b. How have the production processing and marketing of seeds of various recommended crop varieties been organized in the country? Give the role of various agencies involved in this set up:
- c. Describe one important man-made intergeneric poly-ploid which has significant agronomic potential. Also give its origin and characteristics.
- d. Why should the cultivator be advised not to save seed of his hybrid maize crop for raising the next crop? How is seed of hybrid maize produced? Give details.

2. Answer the following questions

- a. What properties of the DNA molecule distinguish it as the 'genetic material' How is DNA exactly copied during chromosome replication?
- b. How do you distinguish between:
  - i. Antigens and Antibodies
  - ii. Dikaryotization and Diploidization.
- c. What is genetic deciphering? What are its prospects?
- d. How can you ascertain whether a chromosome is controlled by the cytoplasm? Cite an example of exploitation of cytoplasmic inheritance in crop improvement.

3. Answer the following questions

- a. With the help of suitable diagrams, compare the phasic divisions and growth stages in early and late maturing high yielding varieties of rice, How does this knowledge help in planning the nursery and field husbandry practices?
- b. Discuss the role of water in physiology of crop plants. What is the significance of transpiration in plants and what are the factors affecting this phenomenon?
- c. What is the photoperiodism? How does it affect crop plant distribution and yield? Make special mention of Indian work on photo-periodism.
- d. What are the two phases of respiration? Explain the process of Krebs's cycle and how much energy is released in one cycle of reaction.

4. Answer the following questions

- a. Critically comment on the following:
  - i. The reported existence of photosystem I and II
  - ii. The discovery of photosynthetic unit and quanta-somes.

- iii. The use of  $C^{14}O_2$  in tracing the path of carbon on 'dark' reaction (iu). Glycolate metabolism and photorespiration.
- b. What are the major physiological differences between  $C_3$  and  $C_4$  plants? How these physiological differences are related to dry matter production?
- c. What is meant by efficiency of a biological system? How, would you rate the efficiency of:
  - i. respiration
  - ii. protein synthesis?

## Section B

5. Answer any three of the following in about 200 words each:

- a. How does fruit belt formation help fruit production in India? Name different fruit belts of the country.
- b. Describe the role of plant protection in successful orcharding with particular reference to mango.
- c. What is the role of Kharif onion in the improvement of economic status of farmers? Describe suitable package of practices to get profitable yield of onion.
- d. Mention the steps from development to release of an improved variety of vegetable with reference to role of All-India co-ordinate vegetable Improvement project.

6. Answer the following questions

- a. What are the broad principles for disease control in crop plants? Describe biological disease control in any crop
- b. Describe the symptoms and control of the following diseases:
  - i. Downy mildew of pearl millet
  - ii. Khaira disease of rice.
  - iii. Powdery mildew of pea.
- c. What are the common modes of transmission of viral diseases? Name any disease that is caused by virus in a crop and suggest methods of controlling it.
- d. Write briefly the important disease of the following crops growing pathogens, symptoms and control measures:
  - i. Rice
  - ii. Potato
  - iii. Mustard.

7. Answer the following questions

- a. What do you understand by integrated pest control? Discuss the importance of integrated pest management in intensive agriculture.
- b. Discuss the problem of field rats in India. How do you control them?

- c. Discuss briefly the prevention and curative measures for control of stored grain pests. Explain in detail the storage pests of pulses.
- d. What factors are known to help minimize the pest problems associated with kharif grain?

Name the important insect pests of cotton and give their control measures.

8. Answer the following questions

- a. Analyse briefly India's present food problem. How far has the Government's food policy been successful in solving this problem?
- b. Explain how modern agricultural technology has influenced the food production and national dietary pattern. Give examples to support your answer.
- c. Why has farming not gained the status of a business in India? Give your specific suggestions to make farming a real business with reference to national agricultural policy.
- d. What are the advantages of price fixing by the State? What are the important considerations in the policy of price support by Government for agricultural produce?