IAS Mains Agriculture 1993

Paper-II

Section A

1. Answer any three of the following in about 200 words each:
    a. What is the role of hybridization in the improvement of crop plants? Explain the technique followed for incorporating the following:
        i. Disease resistance
        ii. Quality improvement Cite specific examples.
    b. State the recognised classes of pure seed. Explain the process of seed certification and discuss how purity of seed is maintained at production level and in the field.
    c. What is an idiotype? How is the idiotype of rice/wheat conducive to increasing crop production?
    d. Discuss the internal and external factors that favour flowing of a plant. Explain to what extent can these factors be manipulated.

2. Answer the following questions
    a. Discuss the scope of crop introduction as a means of crop improvement. What are the drawbacks of the method and how are they overcome in practice?
    b. What is genetic engineering? Explain the scope and practical utility and its limitations in crop production.
    c. Define the term “mutation” and give its origin. What are different types of mutations? State their role in crop improvement
    d. What are enzymes and co-enzymes? Explain their properties, mode of action with suitable examples.

3. Differentiate between the following:
    a. Photosynthesis and Respiration
    b. Growth promoter and Growth retardant
    c. Absorption and Adsorption
    d. Germination test and Quick Viability test

4. Answer the following questions
    a. Write short notes on:
        i. Vernalization
        ii. Symbiosis
        iii. Seed dormancy
        iv. Senescence

b. What is a clone? Compare a clone, pureline inbred line and a sib-mated line with each other.

c. State the place of origin, translocation, effect on plant growth and mode of disintegration of natural auxins in plants.

d. Give an account or various presowing treatment of seeds stating the objective, chemicals used and method of treatment.

Section B

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

a. Name the causal organism, describe the symptoms, mode of spread, and control of the following:

i. Red rot of sugarcane

ii. Tungro of rice

iii. Early blight of potato

iv. Blackarm of cotton

b. What is parthenocarpy? State some important par-thenocarpic fruits. Explain how parthenocarpy is achieved by breeding and by chemicals.

c. Describe the preventive and curative measures for control of stored grain pests of wheat, rice and gram.

d. 'Resistance breeding is the only durable solution to the ever increasing disease problems.'

Discuss this statement with reference to economic, ecologic and agronomic angles.

6. Answer the following questions

a. What are the various methods of asexual propagation of horticultural crops? What are the advantages of each method?

b. Give the varities recommended, season of sowing, spacing seed rate and manurial schedule for the following crops

i. Potato

ii. Tomato

iii. Bhendi

iv. Cauliflower

c. What is dormancy. In what types of plants you come across dormancy? What factors help to break dormancy and what are the chemicals used for breaking dormancy?

d. What is ripening? State the factors affecting ripening. Explain various methods of ripening fruits.

7. Answer the following questions

a. Differentiate the following terms with suitable example:

i. Disease escape

ii. Disease tolerant

iii. Disease immune

iv. Disease protection

b. Explain the term ‘Biological control of pests and diseases’ Cite examples of biological control against insect pests and diseases and state its advantage over the conventional control measures.

c. What is a virus? How does it differ from bacteria and mycoplasma? State the important virus diseases of the following crops, their modes of spread, resistant varieties and control measures:

i. Banana

ii. Rice

iii. Tobacco

iv. Sugarcane

d. Write short notes on:

i. Powdery mildew

ii. Aflaloxin

iii. Alternate host

iv. Carbamate insecticide

8. Answer the following questions

a. Discuss how far will the increase in agricultural production meet the needs of the growing population of India. Justify your answer with necessary statistics.

b. What is the chief cause of protein malnutrition in India? Why is it more pronounced in young children? Suggest remedial measures.

c. Discuss the necessity of providing timely credit to the Indian farmer. How far do the existing financial institutions meet the need?

d. What are the causes of the wide price-spread of agricultural commodities, particularly fruits and vegetables in marketing? What remedies, in your opinion, would fetch the right price to the right price to the Indian farmer?