

AGRICULTURE (Paper II)

Time Allowed : Three Hours

Maximum Marks : 300

QUESTION PAPER SPECIFIC INSTRUCTIONS

(Please read each of the following instructions carefully before attempting questions)

There are EIGHT questions divided in two Sections.

Candidate has to attempt FIVE questions in all.

Question Nos. 1 and 5 are compulsory and out of the remaining, any THREE are to be attempted choosing at least ONE question from each Section.

All questions carry equal marks.

Wherever any assumptions are made for answering a question, they must be clearly indicated.

Word limit in questions, wherever specified, should be adhered to.

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 ww and a dominant gene (G), the colour is yellow, but when G is absent (i.e. gg), the colour is green. Give the F₂ 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.
 - (a) Discuss the success/failures of Green Revolution.
 - (b) Comment upon fossil energy, fixation of energy and biomass.
3.
 - (a) What are the components of cytoplasm? Give their functions.
 - (b) (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 borne 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. (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. (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.