

AGRICULTURE (Paper II)

Time Allowed : Three Hours

Maximum Marks : 250

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.

The number of marks carried by a question/part is indicated against it.

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

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

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

SECTION 'A'

1. Answer the following questions in maximum of 150 words each:

10×5=50

 - (a) Discuss the usefulness of field inspection for seed certification.
 - (b) Briefly describe the molecular mechanisms involved in heterosis.
 - (c) Discuss the usefulness of autopolyploidy in crop improvement.
 - (d) Which measure of heritability (broad sense or narrow sense) will be appropriate for selection in a mixture of homozygous lines and for segregating generations. Explain the basis for your answer.
 - (e) Briefly describe the salient features of cytoplasmic inheritance, and give the reasons therefor.
2. Discuss/Explain the reasons for the following in maximum of 200 words each:

12½×4=50

 - (a) Purelines become genetically variable with time.
 - (b) Interspecific hybrids show variable degrees of sterility.
 - (c) Horizontal disease resistance is preferable to vertical resistance.
 - (d) Cross-pollinated species show more inbreeding depression than self-pollinated species.
3. Write short notes on the following (maximum of 200 words each):

12½×4=50

 - (a) The Protection of Plant Varieties and Farmer's Rights Act (2001).
 - (b) Classes of improved seed.
 - (c) Genetically modified food.
 - (d) Sex-influenced and sex-limited characters.
4. Explain the following in maximum of 200 words each:

12½×4=50

 - (a) Usefulness of somatic hybridization for creating genetic variation.
 - (b) Genetic consequences of repeated backcrossing.

- (c) DNA fingerprinting in plant variety registration/protection.
- (d) Transgenic plants for disease/insect resistance.

SECTION 'B'

5. Briefly describe the following in 150 words each: **10×5=50**
- (a) The mechanisms of ion transport across membranes.
 - (b) The relative responses of photosynthesis in C_3 and C_4 plants to temperature and CO_2 concentration.
 - (c) The roles of curing and degreening in reducing post-harvest losses of fruits and vegetables.
 - (d) Woolly apple aphid and its control.
 - (e) Various methods of planting onions, and post-harvest management of onions.
6. Describe/Explain the following in 200 words each (maximum): **12½×4=50**
- (a) Mechanism of translocation of water from roots to leaves.
 - (b) Powdery mildew of rose and its control.
 - (c) Effects of dormant pruning on trees.
 - (d) Use of root stocks in apple cultivation.
7. Write short notes on the following in 200 words each (maximum): **12½×4=50**
- (a) Water potential of plant cells.
 - (b) Fermentation for fruit and vegetable preservation.
 - (c) Cotton whitefly and its control.
 - (d) Cauliflower cultivation under the following heads: transplanting and post-harvest management.
8. Discuss the following in 200 words each (maximum): **12½×4=50**
- (a) Biochemical functions of N and K in plants.
 - (b) Role of gibberellins in plant growth and development.
 - (c) Preservation of fruits and vegetables by sugar.
 - (d) The strengths and weaknesses of the public distribution system in India.