

BOTANY

PAPER—II

Time Allowed : Three Hours

Maximum Marks : 200

**QUESTION PAPER SPECIFIC INSTRUCTIONS**

**Please read each of the following instructions carefully before attempting questions**

There are EIGHT questions in all, out of which FIVE are to be attempted.

Question Nos. 1 and 5 are compulsory. Out of the remaining SIX questions, THREE are to be attempted selecting at least ONE question from each of the two Sections A and B.

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.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Neat sketches may be drawn, wherever required.

Answers must be written in ENGLISH only.

1. Write short notes on the following : 8×5=40
- (a) Cell adhesion
  - (b) Structure of mitochondria and their role in the production of ATPs
  - (c) Sex-linked inheritance
  - (d) Tests of significance and their uses
  - (e) Male sterility and its role in plant breeding
2. (a) Give a brief account of numerical and structural variations in chromosomes and their significance. 20
- (b) Give a brief account of multigene families. 10
- (c) Describe in detail the backcross and pedigree methods of plant breeding. 10
3. (a) Give a detailed account of regulation of gene expression. 20
- (b) Explain the structure and significance of polytene and B chromosomes. 10
- (c) Comment on the role of RNA in origin and evolution. 10
4. (a) What is cell signalling? Give a brief account of cell receptors. 20
- (b) Explain the structure and functions of extracellular matrix. 10
- (c) Write a note on different methods of gene mapping. 10

## SECTION—B

5. Write short notes on the following : 8×5=40
- (a) Role of apospory and diplospory in plant breeding
  - (b) Photoperiodism
  - (c) RuBisCO
  - (d) Sovereign Rights and Intellectual Property Rights
  - (e) Phosphorus and nitrogen cycles
6. (a) Give a brief account of direct and indirect methods of gene transfer in plants. 20
- (b) What are enzymes and coenzymes? Describe their mechanism of action. 10
- (c) What are the various threats to plant diversity? Give a detailed account of *in situ* and *ex situ* methods of its conservation. 10
7. (a) Describe the patterns and trends of ecological succession. Discuss its significance. 20
- (b) What are secondary metabolites? Discuss their importance. 10
- (c) What are the various applications of micropropagation? 10
8. (a) Give an account of the causes and consequences of global warming. Write down the different measures to control this phenomenon. 20
- (b) What are Nif genes? Describe their role in the regulation of nitrogenase enzyme. 10
- (c) Discuss pentose phosphate pathway and its significance. How does it differ from glycolytic pathway? 10

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