

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.

Answers must be written in **ENGLISH** only.

Neat sketches may be drawn, wherever required.

SECTION 'A'

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| 1. | Write short notes on each of the following : | 8×5=40 |
| 1.(a) | Complexes in electron transport chain of mitochondria. | 8 |
| 1.(b) | Molecular basis of sex determination. | 8 |
| 1.(c) | Significance of accessory chromosomes. | 8 |
| 1.(d) | Merits and demerits of GM plants in India. | 8 |
| 1.(e) | Chi-square test. | 8 |
| 2.(a) | Describe the number and structural variations in chromosome. Add a note on their significance. | 15+5=20 |
| 2.(b) | Describe with illustrations about chromosomal behaviour during meiosis with translocation, inversion and duplication. | 10+10=20 |
| 3.(a) | Elucidate the role of RNA in the origin and evolution of living organisms. | 10+10=20 |
| 3.(b) | With suitable example, explain the tripartite sex-determination. | 20 |

- 4.(a) Explain the bio-chemical and molecular basis of mutations. 10+10=20
- 4.(b) Narrate briefly the various methods of gene transfer in plants. 20

SECTION 'B'

5. Write brief notes on each of the following: 8×5=40
- 5.(a) Allelopathy 8
- 5.(b) Intellectual property rights 8
- 5.(c) Molecular markers in plant breeding 8
- 5.(d) Role of carotenoids in plants 8
- 5.(e) Evidences of organic evolution 8
- 6.(a) "Calvin cycle is said to be autocatalytic" — Justify the statement. Compare the mode of CO₂ assimilation in C₃ and C₄ plants. How does C₄ pathway differ from C₃ pathway in terms of efficiency? 5+10+5=20
- 6.(b) Describe the role of phytohormones in agri-horticulture. 20
- 7.(a) With illustration describe the structure of phytochrome. Explain the role of phytochrome in flower development process. 8+12=20
- 7.(b) Describe the methods of breaking seed dormancy. Trace the physiological changes involved during seed germination. 8+12=20
- 8.(a) Phytoremediation is not an ultimate solution to all the maladies of air and water. Explain in detail with specific examples. 20
- 8.(b) Describe the various phytogeographical zones met within India and add their salient features. In an ideal situation, there will be a high temperature and rainfall with restricted snowfall plus *Rhododendron*, Oaks, Orchids and Ferns – what is your inference? 15+5=20