

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.*

*Questions no. **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.*

SECTION A

- Q1. Write short notes on the following :** **8×5=40**
- (a) Chi-square test 8
 - (b) Polyribosomes 8
 - (c) Crossing over 8
 - (d) Non-coding RNA 8
 - (e) Cell signalling 8
- Q2.** (a) Define monohaploids. How can haploids be produced artificially ? Describe. *5+15=20*
- (b) How can genetically uniform plants be produced through micropropagation technique ? 10
 - (c) What is the utility of test cross in plant breeding ? 10
- Q3.** (a) Describe the structure of heterochromatin and euchromatin. How is constitutive heterochromatin different from facultative heterochromatin ? *15+5=20*
- (b) What are lysosomes ? Discuss various functions of lysosomes. 10
 - (c) Discuss the biogenesis of chloroplast. 10
- Q4.** (a) Write a detailed note on direct evidences of organic evolution. 20
- (b) Describe in brief the molecular map of Ti plasmid. 10
 - (c) Write a note on linear regression. What are 'residuals' and why are they important for statistical analysis ? 10

SECTION B

Q5. Write short notes on the following :

- (a) Convention on Biological Diversity 8
- (b) Role of Cytokinin in leaf senescence 8
- (c) Active ion transport in plants 8
- (d) Polarity of water and its significance 8
- (e) Inter-relationship between nitrogen and carbon assimilation in plants 8

Q6. (a) How is ethylene, 'as a phytohormone', different from other hormones ? Explain its mechanism of action and physiological effects. 5+5+10=20

(b) What is enzyme inhibition ? Describe reversible enzyme inhibition and its types, giving suitable examples. 10

(c) Explain the mechanism and factors causing dormancy of seeds. 10

Q7. (a) Name the complexes and their composition associated with electron transport chain in plant mitochondria. Describe the role of ubiquinone in ATP synthesis in mitochondria. 10+10=20

(b) "Calvin cycle is autocatalytic." – Justify the statement. 10

(c) Explain that C₂ cycle returns to the C₃ cycle, three-quarters of the carbon that would have been lost as glycolate. 10

Q8. (a) Write a detailed note on secondary succession sequence of a forest, post clear felling. Explain the importance of soil seed bank and vegetation diversity in adjacent areas of clear-felled area on the diversity of regenerated ecosystem. 10+10=20

(b) What are point and non-point sources of pollution ? Describe the role of gaseous emissions from a thermal power plant on the atmospheric pollution loads of the area where these thermal power plants are functional. 7+3=10

(c) Write a detailed note on biodiversity hotspots of India. Why is endemism high in such areas ? 7+3=10

