

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

