

BOTANY
(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. Giving reasons explain the following: **10×5=50**
- (a) In what way does Mendel's law of inheritance (dominance) differ from incomplete dominance?
 - (b) Selection of cytoplasmic-genetic male sterility in the development of hybrid varieties
 - (c) Use of FISH technique in tracking the target organisms
 - (d) Application of radiomimetic chemicals
 - (e) Tests of significance in biology
2. (a) Why do chromosomal aberrations happen? **15**
- (b) What are molecular probes? Mention their applications in biology. **15**
- (c) How would you develop improved variety of basmati rice for organic farming conditions? **20**
3. (a) When the glucose-grown cells of 'E. Coli' are transferred to the medium containing lactose, what will be the fate of 'Lac Operon'? **15**
- (b) What do you understand by the 'cell cycle'? Mention the important proteins that control the cell cycle. **20**
- (c) What makes the ribosomal RNA gene (rRNA) suitable for phylogenetic studies? **15**
4. (a) Briefly describe the various types of chromosomal aberrations. **20**
- (b) Give an experimental evidence to demonstrate that DNA is the genetic material. **15**
- (c) Describe in detail the structure and chemical composition of ribosomes. **15**

SECTION 'B'

5. Explain the following: **10×5=50**
- (a) Apical dominance
 - (b) IUCN classification of extinction risks
 - (c) Biological species concept

	(d)	Zinc deficiency in crop plants	
	(e)	Mechanism of drought resistance	
6.	(a)	What is seed germination? Define normal and abnormal seedlings.	15
	(b)	Describe the roles played by mesophyll cells and bundle sheath cells in C_4 pathway of CO_2 fixation.	20
	(c)	Define 'biodiversity' and discuss the measures to conserve it.	15
7.	(a)	Describe the role of national and international organisations established for germplasm conservation.	20
	(b)	Explain how proton-motive force drives the synthesis of ATP.	15
	(c)	Give a brief note on the concept of sustainable development.	15
8.	(a)	Explain how air and water pollution affect the agro-ecosystems.	20
	(b)	What are 'sympasmids'? Mention their role in root nodulation and N_2 -fixation in the leguminous plants.	15
	(c)	Does the process of nitrification synthesize ATP, and how is this energy conserved?	15