

BOTANY (Paper II)

Time Allowed : Three Hours

Maximum Marks : 300

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.

SECTION 'A'

1. Explain any FOUR of the following in about 150 words each:— **15×4=60**
- (a) Signal transduction in Prokaryotes
 - (b) Spontaneous mutations
 - (c) RFLPs
 - (d) Origin of mitochondria
 - (e) Normal distribution.
2. (a) Explain FISH technique and its importance in understanding genomic relationships among species. **30**
- (b) Distinguish between:
- (b)(i) Smooth and rough ER **10**
 - (b)(ii) Ribosomes and Peroxisomes **10**
 - (b)(iii) Membrane proteins in ion transport. **10**
3. Differentiate between:
- (a) Negative and positive gene regulation. **15**
 - (b) Homologous and Heterologous recombinations. **15**
 - (c) Exons and Introns. **15**
 - (d) Transition and Transversion. **15**
4. (a) Describe in detail the Agrobacterium-mediated gene transfers in the development of transgenic crop plants. **30**
- (b) Describe the method of developing maize hybrids. **30**

SECTION 'B'

5. Explain any FOUR of the following in about 150 words each:— **15×4=60**
- (a) Secondary metabolites and plant protection
 - (b) Photolysis of water

	(c)	Calcium in plant growth	
	(d)	CDM	
	(e)	Progressive ecological efficiency.	
6.	(a)	How would you distinguish between enzymes and co-enzymes?	15
	(b)	Differentiate between climacteric and non-climacteric fruits.	15
	(c)	Explain the process of fruit ripening and its regulation.	30
7.	(a)	Explain photo-receptors and their role in regulation of plant growth.	30
	(b)	There are exceptions to the ecological pyramids. Explain.	15
	(c)	Explain the role of surface run-off in nutrient budget of ecosystems.	15
8.	(a)	Mention the attributes of a species to make it invasive.	15
	(b)	Describe the role of growth regulators in sex expression of plants.	15
	(c)	Mention the 'hot spots' of India, and the reasons to recognise them as hot spots.	15
	(d)	'Feedback loops' are the regulatory mechanisms that determine whatever changes take place in the ecosystem. Explain.	15