Civil Services (Main) Examination, 2006

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. Write short notes on any three of the following in about 200 words each: **3×20=60**

- **(a)** Structure of plasma membrane
- **(b)** Polytene chromosomes
- **(c)** DNA damage and repair
- **(d)** Molecular markers in plant breeding

2. **(a)** Explain linkage and crossing-over. Describe the methods of construction of gene maps. **30**

(b) What are mutations? Describe different types of mutations and add a note on chemical mutagens. **30**

3. Explain the following with suitable examples:

- **(a)** Techniques of breeding self-pollinated crops. **20**
- **(b)** Protoplast culture and its importance. **20**
- **(c)** Uses and applications of correlation and regression analysis in plant genetics. **20**

4. **(a)** Explain the mechanism of DNA replication. **20**

- **(b)** Discuss cytoplasmic inheritance. **20**
- **(c)** Describe in brief the regulation of gene expression in eukaryotes. **20**

SECTION 'B'

5. Answer any three of the following. Each part should be answered in not more than 200 words: **20×3=60**

- **(a)** Discuss the role of any three trace elements in plant nutrition. Give their deficiency symptoms.
- **(b)** Explain the mechanisms of respiratory functions in plants.
- **(c)** Discuss the strategies for conservation of endemic and endangered plants.
- **(d)** Describe the causes and consequences of greenhouse effect

6. **(a)** Describe the photosynthetic carbon assimilation in C_3 and C_4 plants. **20**

(b) Explain the factors that affect photosynthesis. Define photosynthetic efficiency of crops. **20**

English version compiled from published transcriptions and cross-checked across sources; not a facsimile of the official UPSC question paper.

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7.	**(a)**	Write an account of the physiological changes that occur during high temperature stress. How plants have adopted physiologically for tolerance of high temperature stress?	**30**
	(b)	Describe the effects of metal stress on plant growth and development.	**30**
8.	**(a)**	Define succession. Explain different stages of succession with illustrations.	**30**
	(b)	Enumerate the structure and functions of an ecosystem.	**30**

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