Civil Services (Main) Examination, 2013

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 consequences of:– **5×10=50**

(a) Exposing polytene chromosomes to actinomycin.

(b) Illegitimate crossing over between a normal and an accessory chromosome.

(c) Intra allelic recombination.

(d) Removal of H_1 histone from a cell.

(e) Exposing dividing cells to CdkI.

2. (a) Describe in detail the formation, structure and chemical composition of glycocalyx. **20**

(b) Citing a suitable example explain tripartite type of sex determination. **15**

(c) Explain how GISH can be used for identifying the putative ancestors of a plant. **15**

3. (a) "Genes do not arise de novo." Keeping in view this fact describe the phenomena that must have helped in increasing the number of genes during evolution. **20**

(b) Where are CMS genes located and how do these act? What are restorer genes? **15**

(c) With the help of any well established example explain how replacement of a purine by a pyrimidine can induce mutations. **15**

4. Briefly describe characteristics and importance of the following:– **5×10=50**

(a) Pachytene

(b) Neo-darwinism

(c) Balanced lethal system

(d) Chi-square test

(e) Linkage

SECTION 'B'

5. What would you conclude if:– **5×10=50**

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(a) A previously lichen-rich area is now devoid of lichens.

(b) A species is added to the Red Data Book.

(c) Saffron corms transplanted to Delhi in December 2010 did not flower in 2011 and 2012.

(d) A plant exhibits kranz anatomy.

(e) A pond is totally covered with Eichornia.

6. (a) What are secondary metabolites? What is their use to the plants and to the human beings? **20**

(b) Describe various sub types of the most abundant biological molecule present in plants. **15**

(c) What is the difference between afforestation and reforestation? What are the gains and pitfalls of monoculture in forestation practices? **15**

7. (a) Describe various phytogeographical zones and their characteristics in India. Give further details of the zone which experiences high temperatures, restricted snowfall and high rainfall, and has adundance of Rhododendrons, Ferns, Orchids and Oaks. **20**

(b) Differentiate between growth, development and differentiation and describe the factors that influence these processes. **15**

(c) Discuss how our understanding of stress physiology will help in mitigating problems expected to arise because of rapid changes in global environment. **15**

8. How are these accomplished?

5×10=50

(a) Transport of solutes in phanerophytes.

(b) Proper planning before undertaking any developmental project to avoid its adverse impact on environment.

(c) Energy trapping.

(d) Overcoming seed dormancy.

(e) Control pollution by biotic means.

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