CSM – 15/17

Botany

Paper – II

Time : 3 hours

Full Marks : 300

The figures in the right-hand margin indicate marks.

*Candidates should attempt Q. No. 1 from Section – A and Q. No. 5 from Section – B which are compulsory and any **three** of the remaining questions selecting at least **one** from each Section.*

SECTION – A

1. Write explanatory notes on any **three** of the following : 20×3 = 60

   (a) Ultrastructure and functions of eukaryotic ribosome

   (b) Electroporation as a tool for direct gene transfer

   (c) Cytoplasmic inheritance

   (d) Apomixis in plant breeding

2. (a) Describe the different types of structural alterations of chromosomes and comment on their significance.

(b) Describe the biochemical properties of prions. Explain prion hypothesis with suitable example.

(c) Give an illustrated account of **Agrobacterium** mediated gene transfer in plants. 20×3 = 60

3. (a) What is a nucleosome ? Describe the ultra-structure of chromosome based on nucleosome concept.

(b) What is hybridization ? Describe the different steps involved in the process of hybridization for the development of a new crop variety.

(c) Describe, with diagrams, the different sub-stages of meiotic prophase. Comment on the significance of meiosis. 20×3 = 60

4. (a) Give an account of the signal transduction system with reference to different signals and receptors.

(b) Discuss the biotechnological approaches towards the development of insect-resistant transgenic plants.

(c) What are sex chromosomes ? Describe the different methods of chromosomal sex determination. 20×3 = 60

SECTION – B

5. Explain any **three** of the following : 20×3 = 60

(a) Mechanism of photorespiration

(b) Importance of secondary metabolites

(c) Molecular basis of fruit ripening

(d) Components of ecosystem

6. (a) What are micronutrients ? Describe the role of micronutrients in plant metabolism.

(b) Define germination of seed. Explain the physio-biochemical processes involved in seed germination.

(c) Write a detailed account of the measures adopted for the conservation of biodiversity. 20×3 = 60

7. (a) What do you mean by plant succession ? Describe the various stages of succession in hydrosere.

(b) What is endemism ? Write an account of endemism in India.

(c) What are the main aims of conservation ? Discuss the strategies followed for the conservation of soil and water. 20×3 = 60

8. Write explanatory notes on the following : 20×3 = 60

(a) Chemiosmotic theory and ATP synthesis

(b) Physiology and biochemistry of salt tolerance in plant

(c) Kreb's cycle and its significance