

<b>CSM – 15/19</b>
<b>Botany</b>
<b>Paper – II</b>

*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. Answer any **three** of the following in not more than **200** words each : 20×3 = 60
- (a) Salient features of genetic code
  - (b) RNA as genetic material
  - (c) *Agrobacterium*-mediated transformation
  - (d) Both plastids and mitochondria are said to be "semiautonomous" organelles. Explain.

2. (a) Discuss the structural variation in chromosomes. 20
- (b) Write short note on nuclear pore complex. 20
- (c) How are paracrine, endocrine and synaptic signaling mode different from each other ? How does the binding of a single signal molecule to a cell surface receptor result in an amplified response within the target cell ? 20
3. (a) What is epistasis ? Explain the mechanism of epistasis with suitable examples. 20
- (b) What is cytoplasmic / extranuclear inheritance ? How it is different from Mendelian / nuclear inheritance ? 20
- (c) Give an account of the different methods of gene mapping. 20
4. (a) What are transgenic plants ? With suitable examples ? Discuss the applications of plant transformation for crop improvement. 20
- (b) Discuss the use of molecular markers in plant breeding. 20
- (c) Write short note on heterosis. 20

## SECTION - B

5. Answer any **three** of the following in not more than **200** words each : 20×3 = 60

- (a) Give an account of plant succession.
- (b) Write short note on chemiosmotic theory.
- (c) Give an account of impacts of global warming.
- (d) Write a short note on pigments as photoreceptors.

6. (a) Explain the mechanism of photorespiration in detail. Highlight its significance. 20

(b) Explain the process of rhizobial infection and root nodulation in legumes. 20

(c) Discuss the applications of growth substances in agrihorticulture. 20

7. (a) Describe  $\text{CO}_2$  fixation in  $\text{C}_3$ ,  $\text{C}_4$  and CAM plants. 20

(b) What are secondary metabolites ? Discuss their roles in plant defense. 20

- (c) What is phosphorylation ? Differentiate between photophosphorylation and oxidative phosphorylation giving suitable example. 20
8. (a) Enumerate the survival strategies developed by the plants of arid regions. 20
- (b) Enumerate physiological changes associated with fruit ripening. Write a brief account of the molecular basis of fruit ripening. 20
- (c) What are the health hazards of radioactive pollution ? Enumerate their preventive measures. 20

