

31 – CS/11
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 three of the remaining questions, selecting at least one from each Section.

Section – A

- 1. Discuss any three of the following : $20 \times 3 = 60$**
 - (a) Nuclear pore complex**
 - (b) Mechanism of oxidative phosphorylation**
 - (c) Cytoplasmic inheritance**
 - (d) Heterosis**
- 2. (a) Give a comparative account of co-translational and post-translational**

- translocation of secretory proteins into the endoplasmic reticulum. 20
- (b) What are the modes of cell-cell signaling ? Discuss the important pathways of intracellular signal transduction. 20
- (c) Discuss briefly the regulators of cell cycle progression. 20
3. (a) What is the significance of mutation in evolution ? Discuss the molecular mechanism of mutation. 20
- (b) Explain briefly the repressible operon system with suitable example. 20
- (c) What are the characteristics of sex-linked inheritance ? Explain with suitable example. 20
4. (a) Give an illustrated account of Ti plasmid with special reference to its T-DNA and vir regulon. Explain the mechanism of its transfer in plant genome, 20
- (b) Distinguish between selectable and scorable markers used for gene transfer in plants. 20

- (c) Explain the methods applied in plant breeding for crop improvement. 20

Section – B

5. Answer any three of the following in about 200 words each : $20 \times 3 = 60$

(a) How enzyme catalyses the biochemical reactions ? Give the derivation of the rate equation for one substrate one enzyme catalyzed reaction.

(b) What is biological N_2 fixation ? Describe the mechanism of biological N_2 – fixation.

(c) Give an account of the bioremediation.

(d) Give an account the strategies adapted to conserve the forest ecosystem.

6. (a) "Photorespiration is an unavoidable evil of the existence of oxygen in the atmosphere and of active site chemistry of RUBP carboxylase/oxygenase". Discuss. 30

(b) What is Phosphorylation ? Give an account of the various types of phosphorylation linked to the generation of ATP. 30

7. (a) Give an account of the effects of salinity and drought on the photosynthetic CO_2 assimilation. 30
- (b) What are growth substances ? Discuss their role and applications in agrihorticulture. 30
8. (a) What do you mean by afforestation and deforestation ? How does deforestation cause deterioration of the quality of life in a society ? 20
- (b) Give an account of the forests of Odisha. 20
- (c) Give an account of the causes and consequences of global warming. 20



Examrace