Time – 3 hr. **Marks - 100**

N.B. 1. All questions are compulsory.
2. Draw neat labelled diagrams wherever necessary.
3. All questions carry equal marks.

Q.1 Attempt any two **20**

a Describe in detail the structure of a pre mRNA molecule.
b Explain the steps involved in the process of elongation of a polypeptide chain during protein synthesis
c Explain degeneracy and Wobble as characteristics of the genetic code
d Describe the structure and function of nucleopore complex.

Q.2 Attempt any two **20**

a Define carriers and explain their role in transport of solutes across a cell membrane.
b Describe the anatomy of sieve tube elements and companion cells.
c Describe matric, solute and pressure potential as components of water potential
d What is meant by passive transport? Describe the modes of passive transport in plants.

Q.3 Attempt any two **20**

a What is bioremediation? Discuss the methods of *ex situ* bioremediation.
b What is Phytoremediation? Discuss the various processes involved in phytoremediation of metals.
c Describe the Monoclimax theory and Polyclimax theory in plant succession.
d Explain the process of succession observed in Xerosere giving examples of plants in each stage.

Q.4 Attempt any two **20**

a What is somatic embryogenesis? Give the method of inducing somatic embryogenesis.
b Explain the technique of isolation of protoplast. Add a note on its applications.
c What is plant cell suspension culture? Discuss its application for the production of secondary metabolites.
d Elaborate on the principle and methods involved in plant tissue culture with reference to micropropagation.

Q.5 Attempt any four **20**

a Sequestration of toxic compounds
b Role of transpiration in regulation of leaf temperature
c Concept of source and sink
d Factors involved in bioremediation.
e Phytostabilisation
f Advantages of synthetic seeds
