(3 Hours) **[Total Marks : 100]**

N.B.: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labeled diagrams wherever necessary.

Q.1 Answer any **Two** of the following:- **20**

A) Give an account of structure of vacuole in plant cells. Add a note on any two functions of vacuoles.
B) Describe the steps involved in elongation of the protein chain.
C) Describe the process of initiation of translation in eukaryotes.
D) What are Polytene chromosomes? Write a note on their structure, occurrence and possible functions.

Q.2 Answer any **Two** of the following:- **20**

A) "Transpiration is a necessary evil". Explain. Comment on various modes of transpiration.
B) Explain how water potential helps in the translocation of solutes in plants.
C) Describe the role of carriers in transport of solutes across cell membranes.
D) What are macronutrients? Describe the role and deficiency symptoms of any two macronutrients studied by you.

Q.3 Answer any **Two** of the following:- **20**

A) What is bioremediation? Explain the role of microbial population in bioremediation.
B) What is phytoremediation? Explain phytoremediation of organic pollutants by plants.
C) Define plant succession. Explain any three stages of a xerosere citing suitable examples of plants.
D) What is bioaccumulation? How does bioaccumulation take place in an ecosystem?

Q.4 Answer any **Two** of the following:- **20**

A) What are artificial seeds? State the various steps involved in production of artificial seeds.
B) Write a detailed note on aspects of micropropagation with reference to Orchid cultivation.
C) Explain the industrial method of production of Shikonin.
D) Give a detailed account of Somatic hybridisation.

Q.5 Answer any **Four** of the following:- **20**

a) Degeneracy of genetic code
b) Composition of phloem sap
c) Electrofusion of protoplasts
d) Characteristics of ecological succession
e) Monoclimax theory
f) Advantages of somatic embryogenesis

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