

[Time: 2½ Hours]

[ Marks:60]

Please check whether you have got the right question paper.

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

- Q.1 Give an account of degradation and monitoring of pollutants from a biological origin. 12
- OR**
- Q.1 a) Explain modalities and local influences in Environmental biotechnology. 06  
b) Describe metabolic pathways in environmental biotechnology. 06
- Q.2 Explain microbial growth kinetics in batch fermentation. 12
- OR**
- Q.2 a) Explain different types of continuous culture. 06  
b) Explain types and application of Fed- batch culture. 06
- Q.3 Explain mechanism, principle and working of biosensors. 12
- OR**
- Q.3 a) Explain genetic indicators used in monitoring pollution. 06  
b) Explain land (site) Sampling, water sampling and air sampling methods used in Environmental monitoring. 06
- Q.4 Explain the role of production of protoplasts, somaclonal variation and protoplast fusion in somatic cell genetics. 12
- OR**
- Q.4 a) Explain germplasm and biodiversity in transgenic animals. 06  
b) Enumerate various concerns regarding safety of transgenic crops. 06
- Q.5 Write short notes on **any three** 12
- a) Biomass productivity in continuous culture.
  - b) Importance of EIA.
  - c) Haploid production.
  - d) Proteomics in environmental monitoring.
  - e) Scope of environmental biotechnology.
  - f) Bioindicators