

[Time: 2½ Hours]

[Marks:60]

Please check whether you have got the right question paper.

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

- Q.1 Attempt any **two** of the following:
- a) Explain biosynthesis of an antibiotic by Complementation method. 06
 - b) Discuss general properties and commercial applications of bacterial polysaccharides. 06
 - c) Explain commercial production of Xanthan gum by using genetically engineered microbe. 06
 - d) Explain biosynthesis of polyhydroxyalkanoates. 06
- Q.2 Attempt any **two** of the following:
- a) Explain microbial synthesis of Indigo. 06
 - b) What is immobilization? Discuss lattice entrapment method of immobilization. 06
 - c) Give an account of immobilized enzyme reactors. 06
 - d) Discuss enzymes as tools used in diagnostic assays. 06
- Q.3 Attempt any **two** of the following:
- a) Explain steps involved in genetic engineering of nitrogenase gene. 06
 - b) Discuss the steps involved in genetic engineering of nodulation genes. 06
 - c) Comment on the mode of action and use of thuringiensis toxin. 06
 - d) Comment on marine natural products with respect to their medical potential. 06
- Q.4 Attempt any **two** of the following:
- a) Discuss use of algae in bioabsorption of metals. 06
 - b) Comment on phytoremediation and its use in biotechnology. 06
 - c) Explain the different types of bioleaching. 06
 - d) Comment on microorganisms used for bioleaching. 06
- Q.5 Write notes on any **Four** of the following:-
- a) Uses of aminoglycosides 03
 - b) Commercial application of agar 03
 - c) Covalent coupling method of immobilization 03
 - d) Use of biosensors 03
 - e) Hydrogenase 03
 - f) Fuels from algae 03
 - e) Bioabsorption of metals by fungi 03
 - f) Packed bed bioreactor 03