

**SL No of QP :9334**

Scheme/Mode of Examination : NEP-UGCF  
Name of the Paper : Applications of Microbes in Biotechnology  
UPC/Subject Code : 2534001203  
Maximum marks : 60  
Time : 2 hours

**Instructions for candidates**

Attempt any five questions. All questions carry equal marks. Attempt all parts of the question together.

1. Differentiate between the following: - 3x4=12
  - a. Biogas and biofuel
  - b. Transgenic drought and frost stress-resistant plants
  - c. Insect and virus-resistant plants
  
2. Write short notes on the following: 3X4=12
  - a. Bioplastic
  - b. Genetically engineered microbes
  - c. Gene Therapy
  
3. a. What is microbial biotechnology? Discuss its importance in environmental management with suitable example. (1+5=6)  
b. Describe the applications of biofertilizers and biopesticides with suitable examples. (6)
  
4. a. Briefly discuss the advantages and disadvantages of Bt Cotton. (4)  
b. Who developed Golden rice and how it can solve the Vitamin A deficiency syndrome? (4)  
c. Briefly explain the production of insulin. (4)
  
5. Discuss the production and application of the following:
  - a. Glutamic acid
  - b. Microbial biosensor
  - c. High fructose corn syrup (3X4=12)
  
6. a. What do you understand by bioleaching? Describe the roles of microbes in metal recovery citing suitable examples. (1+5=6)  
b. Comment on Covishield vaccine. (3)  
c. What do you understand by superbug? Discuss its importance. (3)