

M.Sc.(Microbiology) (CBCS Pattern) Sem-III  
**PSMBT-11 - Paper-III : Bioprocess Technology**

P. Pages : 1

Time : Three Hours



**GUG/W/22/11293**

Max. Marks : 80

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- Notes : 1. All questions are compulsory and carry equal marks.  
2. Draw diagrams wherever necessary.

1. Explain in detail optimization of fermentation process. **16**

**OR**

- a) Explain Immobilized system and add a note on kinetics of a immobilized. **8**  
b) Explain the significance of solvent extraction, concurrent and counter current extractors in downstream processing. **8**

2. Discuss any two methods of purification of fermentation product. **16**

**OR**

Explain the principal and application of Adsorption chromatography in downstream processings. **16**

3. Discuss the rDNA technology for ethanol production. **16**

**OR**

- a) Write a note on Biopolymers. **8**  
b) Discuss about Steroid transformations. **8**

4. Give detail account on production and application of Vit. B<sub>12</sub>. **16**

**OR**

Discuss the industrial production of lactic acid from whey and write its application.

5. Write a short note on followings.

- a) Kinetics of immobilized reactors. **4**  
b) Types of Filters. **4**  
c) Production of Bio-preservatives. **4**  
d) Different sources of Bio-fuels production. **4**

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