

**D 41694**

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**Name.....**

**Reg. No.....**

**THIRD SEMESTER M.Sc. DEGREE EXAMINATION, FEBRUARY 2008**

General Biotechnology

**GBT 212—BIOPROCESS TECHNOLOGY**

Time : Three Hours

Maximum : 80 Marks

**Section A**

*Answer any **two** questions.  
Each question carries 10 marks.*

1. How to meet the nutritional requirements of microorganisms in a large scale nutritive medium using cheaper inputs ?
2. What are the methods of immobilization of microbial cells ? Discuss their industrial usefulness.
3. Brief the process of industrial production of ethanol. What are the advantages and disadvantages in using *Zymomonas mobilis*.

(2 x 10 = 20 marks)

**Section B**

*Answer any **ten** questions.  
Each question carries 5 marks.*

4. Explain CSTR (Continuous Stirred Tank Reactor).
5. Why air has to be sterilized ? What is the large scale method of air sterilization ?
6. How to prevent the formation of foams in the large scale operations ?
7. How vinegar is produced ?
8. What is the downstream process involved in streptomycin production ?
9. How to treat the effluent originating from penicillin production industries ?
10. How to prepare inoculum for the industrial processes ?
11. Differentiate "homo" and "hetero" fermentative processes citing an example.
12. What are the major parameters to be monitored and controlled in an industrial fermentation process ? Brief the type of devices used.
13. What are the chemical and physical factors controlling the growth of microorganism ?
14. How the large scale media are sterilized using spiral heat exchangers ?
15. How continuous centrifugation is achieved in downstream processing ?

(10 x 5 = 50 marks)

**Turn over**

**Section C**

*Answer all questions.*

*Each question carries 2 marks.*

16. What are the different phases in microbial growth ?
17. How to preserve anaerobic microorganisms ?
18. Differentiate “fermenters” and “bioreactors”.
19. What is “Saccharification” ?
20. How to achieve continuous culturing of microbes ?

(5 x 2 = 10 marks)