L 1034

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Fourth Semester

Bio-Technology

BT 1251 — BASIC INDUSTRIAL BIOTECHNOLOGY

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why are secondary metabolites referred to as "Biochemical Appendices"?

2. Give the scheme of a plant for the production of absolute alcohol.

3. Differentiate between liqueurs and spirits.

4. With the help of a flow chart show the production of citric acid by the precipitation method?

5. Define mutasynthesis.

6. Give an example of an aminoglycoside antibiotic, its application and a producing strain.

7. Name two methods by which enzyme productivity can be increased many-fold.

8. What is nisin and its application?

9. Give two methods by which L-glutamate production in C. glutamicum be increased.

10. Differentiate between "Callus" cultures and "Suspension" cultures.

PART B — (5 × 16 = 80 marks)

11. (i) Write a note on the commercial use of amino acids. (3)

(ii) Discuss strategies to improve production of amino acids. (3)

(iii) Give a scheme for the material flow in L-glutamate production plant and discuss the production process along with a scheme of the main reactions in L-glutamate formation from glucose. (10)

12. (a) How is citric acid produced? Give a flow chart for the manufacture of citric acid.

What are the applications of citric acid?

Or

(b) (i) Write a note on PHA, PHB and biopol and its importance in medicine and commerce. (4)

(ii) How is PHB metabolism regulated? (2)

(iii) Discuss production of PHA by plants microbial sources. (6)

(iv) Describe the 2-stage bioprocess for the production of PHA. (4)

13. (a) (i) What are the different types of reactors used in the biotech industry? (10)

(ii) On what basis is the selection of a reactor made? (6)

Or

(b) (i) Give a flow chart for the production of cheese. (6)

(ii) Write a detailed note on the manufacture of cheese. (10)

14. (a) (i) How can the production of secondary metabolites be enhanced? (6)

(ii) What is the process for production of β-lactam antibiotics and the recovery of the product? (10)

Or

(b) How can you recover and isolate α-amylase from Bacillus amyloliquefaciens?

15. (a) (i) Outline the process for the cultivation of mammalian cells. (6)

(ii) How are mammalian cells genetically engineered? (6)

(iii) How can perfusion cultures be used in biomass production of mammalian cells? (4)

Or

(b) Discuss a strategy for the production of biopesticides from Bacillus sphaericus.