

H 1324

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

Sixth Semester

Industrial Biotechnology

IB 039 — CHROMATOGRAPHIC SEPARATIONS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. A gas chromatogram of an organic compound using a 20.0 cm column yielded a peak with a retention timer of 13.3 minutes and a width of 0.12 minutes. Calculate N and H.
2. What is HETP?
3. Compare Packed and Open columns in GC.
4. How does small particle size affect elution profile in HPLC?
5. Write a note on the TLC.
6. Give two resins commonly used in Ion-Exchange chromatography.
7. What is meant by isocratic elution?
8. A mixture of amino acids containing Histidine, Valine, Alanine, Glutamic acid and Asparagine are separated using HIC. What is the order of elution?
9. What is Capillary electrophoresis?
10. Define retention factor and selectivity.

PART B — (5 × 16 = 80 marks)

11. (i) Mathematically prove that a single step extraction is less efficient than a multi-step one.
- (ii) Explain the Plate and Kinetic theory of chromatography.
12. (a) Give a detailed explanation of the various factors that affect efficiency of a chromatographic system.

Or

- (b) Write short notes on :
- (i) Reverse phase chromatography
- (ii) Hydrophobic interaction chromatography.
13. (a) Give a detailed description of the GC system. What are the different detection systems used in GC systems?

Or

- (b) (i) How the sample is prepared for GC analysis? (8)
- (ii) Explain with example the interpretation of GC output result. (8)
14. (a) Give a detailed description of HPLC with diagrammatic representation.

Or

- (b) Justify the potential of HPLC as a valuable tool in biotechnology.
15. (a) Explain the theory of Capillary Electrophoresis along with its application.

Or

- (b) Write short notes on :
- (i) Ion exchange chromatography
- (ii) Gel permeation chromatography.