Fourth Semester B. Tech. (Biotechnology) (CBS) Examination

ANALYTICAL BIOTECHNOLOGY

Paper - BT BIT . 403T

Time : Three Hours] [Max. Marks : 80

N. B. : (1) All questions carry equal marks.
(2) Answer any **five** questions.
(3) Diagrams and Chemical equations should be given wherever necessary.
(4) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Give the theory of centrifugation. Explain differential and density gradient centrifugation technique. 8

   (b) Describe operation and applications of ultracentrifuge. 8

2. (a) Explain use of radioactive tracers in biotechnology research. 8

   (b) Describe in detailed proportional and scintillation counter alongwith its application. 8

3. (a) With well labelled diagram explain the principle, construction and working of UV-visible spectrophotometer. 10

   (b) Describe briefly various spectroscopic methods for study of protein structure prediction. 6

4. (a) Describe briefly neat instrumentation arrangement of high pressure liquid chromatography and explain applications of HPLC in Biological research. 8

(b) Write an account of concept of thin layer chromatography stating its applications in separation of biomolecules. 8

5. (a) Explain how will you separate nucleic acids using electrophoretic techniques. 6

(b) Write an account of SDS PAGE for determination of molecular weight of proteins. 5

(c) Give applications of Gel documentation system. 5

6. (a) Explain Gel Permeation Chromatography technique for determination of molecular wt. and homogeneity of proteins. 10

(b) Discuss the applications of mass spectrometry and LCMS in characterisation of proteins. 6

7. Answer any **two** :—

(a) Differentiate between Radioactive and non-radioactive isotopes.

(b) State applications of Infra Red (IR) and Raman spectroscopy in biotechnology.

(c) Explain paper chromatography technique for separation of amino acids. 16

8. Write note on :—

(a) Spectrofluorometer.

(b) Affinity chromatography.

(c) Western blotting technique.

(d) Magnetic resonance Imaging. 16