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T 3100

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Fourth Semester

Biotechnology

BT 1254 – INSTRUMENTAL METHODS OF ANALYSIS

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How is signal-to-noise ratio relevant in measurement?
2. What is a transistor and what role does it play in an electronic circuit?
3. What is the source of UV in a spectrophotometer?
4. What is a transducer?
5. Write the Lambert Beer's law and define the various parameters
6. Indicate the region of IR in the electromagnetic spectrum
7. Name any two chromophores that absorb in the Visible region
8. What is plate number and how is it related to resolution?
9. What is the principle of gas chromatography?
10. Write a short note on flow through detectors.

PART B — (5 × 16 = 80 marks)

11. (a) Write an essay on the importance of calibration and what methods are available for calibrating any three common analytical instruments used in Biotechnology? (16)

Or

- (b) Write an essay on the principle of working and uses of various optical instruments used in Biotechnology. (16)

12. (a) Describe the theory and instrumentation associated with Raman Spectroscopy. (16)

Or

- (b) Describe how IR is useful in analytical spectrometry as well as in other instrumentations relevant to biological research. (16)

13. (a) Give a detailed account of functioning of differential scanning calorimetry and its utility. (16)

Or

- (b) Give a comprehensive account of any four spectroscopic measurements employed in the analysis of biological materials. (16)

14. (a) Describe how Fourier transform measurements are utilized in various optical methods or spectrometric methods. (16)

Or

- (b) Describe the various parameters that govern separation in a chromatography set-up. (16)

15. (a) Describe the salient features of HPLC that contribute to high resolution separation. (16)

Or

- (b) Write an essay on the principle, types and uses of ion-exchange chromatography. (16)