

Principle paper BT 203 Instrumentation and analytical techniques

Section I

Unit 1

- 1.1. Electrochemistry : pH and buffers, potentiometric and conductometric titration.
- 1.2. Principle and application of light, phase contrast, fluorescence microscopy.
- 1.3. Principle and application of scanning and transmission electron microscopy, scanning tunneling microscopy,
- 1.4. Principle and application of , atomic force microscopy and confocal microscopy; Cytophotometry and flow cytometry.

Unit 2

- 2.1. Principle and application of gel- filtration, ion-exchange, affinity chromatography, Thin layer chromatography.
- 2.2. Principle and application of GC,HPLC, FPLC.
- 2.3. Principle and application of Centrifugation: Basic principle and application; Differential, density and Ultracentrifugation
- 2.4. Principle and application of X ray diffraction, fluorescence, UV -Visible,IR, NMR and ESR.

Section II

Unit 3

- 3.1. Principle and application of Atomic absorption and plasma emission spectroscopy;
- 3.2. Principle of MALDI.
- 3.3. Principle of electrophoresis- agarose and PAGE ,SDS-PAGE.
- 3.4. Pulse gel and 2D gel electrophoresis.

Unit 4

- 4.1. Principle and applications of tracer technique in biology
- 4.2. ; Radioactive isotopes and half life of isotopes; Effect of radiation on biological system;
- 4.3. Autoradiography; Cerenkov radiation; liquid scintillation spectrometry Cell cycle regulation and cancer
- 4.4. Biosensors and their applications .

References

1. Sharma B K, Instrumental method of chemical analysis
2. D.A. Skoog, Instrumental methods of analysis
3. Plumner, An introduction to practical Biochemistry
4. Chatwal and Anand, Instrumentation
5. **Boyer**, Modern experimental Biology