

M. Sc. (Biotechnology) Sem-II / M. Sc. (Medical Biotechnology) Sem- II
(CBCS 2018 Course) : SUMMER - 2019
SUBJECT : ANALYTICAL BIOTECHNOLOGY

Day : **Sunday**
Date : **21/04/2019**

S-2019-1428

Time : **10.00 AM TO 01.00 PM**
Max. Marks : **60**

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer books.

SECTION – I

- Q.1** Attempt any **FIVE** of the following: **(10)**
- a) Differentiate between micro-filtration and ultra-filtration.
 - b) How to create sucrose gradient for centrifugation experiment?
 - c) Which are the two mechanism by which solids are retained by a filter?
 - d) Enlist the various rotors used in centrifugation.
 - e) Name the various parts of atomic force microscopy (AFM).
 - f) Which properties of biomolecules can be determined by analytical centrifugation?
 - g) Define- **i) Fluorescence** **ii) Quenching**
- Q.2** Attempt any **TWO** of the following: **(10)**
- a) Define structural Biology. Explain the goal of structural biology with example.
 - b) Enlist physical methods of cell disruption and discuss any one in detail.
 - c) Explain various filtration methods. Add a note on merits and limitations of membrane filtration.
- Q.3** Attempt any **TWO** of the following: **(10)**
- a) Discuss the various types of centrifuge. Give their applications in Biotechnology.
 - b) Differentiate between bright field and dark field microscopes. Show schematically working of phase contrast microscope.
 - c) Explain principle and applications of confocal microscopy.

SECTION – II

- Q.4** Attempt any **FIVE** of the following: **(10)**
- a) Name the various components of HPLC system.
 - b) Define i) Shielding and ii) Deshielding in NMR.
 - c) Give different ionization methods in mass spectrometry.
 - d) Enlist the various detectors used in HPLC.
 - e) Give applications of ESR.
 - f) Differentiate between Normal phase and reverse phase HPLC.
 - g) Name the suitable spectroscopic technique for studying the secondary structure of protein.
- Q.5** Attempt any **TWO** of the following: **(10)**
- a) Show schematically working of double beam spectrophotometer. Define Beer-Lambert's law. What are the chromophores present in proteins and nucleic acids?
 - b) How protein structure is determined by XRD?
 - c) Describe various detectors used in mass spectrometry.
- Q.6** Attempt any **TWO** of the following: **(10)**
- a) Define radioisotopes. Describe properties of radioisotopes and their detection methods.
 - b) What is HPLC? What are the advantages does it offer over traditional gravity chromatographic separations?
 - c) Explain the principle of gas chromatography. Describe stationary phase and mobile phase in detail.

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