

**S. Y. B. Sc. (Biotechnology) SEM – IV (CBCS - 2015 COURSE) :**  
**WINTER - 2018**

**SUBJECT: ANALYTICAL TECHNIQUES**

Day: Friday  
Date: 02/11/2018

**W-2018-1181**

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

**N.B.:**

- 1) Q1 and Q5 are compulsory.
- 2) Answer ANY TWO questions from Q 2, 3, 4 in Section I.
- 3) Answer ANY TWO questions from Q 6, 7, 8 in Section II.
- 4) Answers to Both the sections to be written in SEPARATE answer books.
- 5) Draw a labeled diagram WHEREVER necessary.

**SECTION - I**

Q.1) Answer the following: (ANY FIVE) (2 Marks X 5 = 10)

- a) What is the principle of separating molecule by gas chromatography?
- b) Name any two lyophilized products.
- c) What is osmotic pressure?
- d) Name any two gradient medium used in density gradient centrifugation.
- e) State two names of ion exchange resins
- f) Name the various components of HPLC system.

Q.2) Answer the following: (5 Marks X 2 = 10)

- a) Discuss merits and limitations of filtration technique.
- b) Explain the various chromatography techniques?

Q.3) Explain the following: (5 Marks X 2 = 10)

- a) Explain the principal and applications of isopycnic density gradient centrifugation.
- b) Describe the purification of enzymes by chromatography.

Q.4) Write short notes on the following: (5 Marks X 2 = 10)

- a) Lyophilization
- b) MALDI-TOF

**SECTION - II**

Q.5) Answer the following: (ANY FIVE) (2 Marks X 5 = 10)

- a) Explain the term- retention time.
- b) Name the various sub- types of HPLC.
- c) Give the role of mercaptoethanol and SDS in electrophoresis.
- d) Define radio isotopes.
- e) Which are the two factors involved in protein separation by 2D-PAGE?
- f) Differentiate between analytical and preparatory gas chromatography.

Q.6) Answer the following: (5 Marks X 2 = 10)

- a) What are the advantages and disadvantages of gas chromatography.
- b) Explain applications of isotopes and radioisotopes in health and research.

Q.7) Explain the following: (5 Marks X 2 = 10)

- a) Discuss the applications of HPLC in biological research.
- b) Explain the methodology of X-ray diffraction

Q.8) Write short notes on the following: (5 Marks X 2 = 10)

- a) Agarose gel electrophoresis
- b) AFM (Atomic force microscopy)

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