

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

**SUMMER - 2019**

**Subject: Analytical Techniques**

Day: Monday  
Date: 15/04/2019

**S-2019-1383**

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 SAME answer books.
- 5) Draw a labeled diagram WHEREVER necessary.

**SECTION - 01**

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

- a) What are the two subtypes of density gradient centrifugation?
- b) What is the principle of separation by paper chromatography?
- c) Define-sublimation
- d) What is isopycnic density?
- e) Name the various components of HPLC system.
- f) Explain the term shielding and deshielding in NMR.

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

- a) What are the ideal properties of density gradient media,
- b) Explain the principal and applications of lyophilization.

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

- a) What are the advantages and disadvantages of lyophilization process?
- b) Explain the principle of paper chromatography and its applications

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

- a) Nutraceuticals
- b) Analytical HPLC

**SECTION - 02**

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

- a) Define chemical shift and give its unit of measurement.
- b) What is  $^1\text{H}$  and  $^{13}\text{C}$  NMR?
- c) Define isotopes.
- d) What is X-ray diffraction? Give any two applications?
- e) Name the different counters used in radiation measurement.
- f) Enlist the different components of X-ray diffraction technique.

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

- a) Explain principle of NMR.
- b) Describe the various counters used for radiation measurement.

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

- a) Discuss the use of GC in quality control analysis.
- b) Explain the methodology of SDS-PAGE technique.

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

- a) Factors affecting agarose gel electrophoresis separation
- b) AFM (Atomic force microscopy)

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