

M.Sc.(Chem.) Semester - 3 (CBCS) Examination
DEC/JAN. - 2020 - [NEW COURSE]
Separation Techniques (Core (New))

Time: 1:30 Hours

Marks: 42

Instructions:

1. Figure to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1 (a) Answer the following question **4**

- (1) Briefly explain Resolution (R_s) and Capacity Factor (k')

Q.1 (b) Answer any two questions out of three. **10**

- (1) Explain separation of components of mixture using column chromatography.
- (2) Give an account of Eddy diffusion and Longitudinal diffusion with graphical representation.
- (3) Give brief historical account of chromatography and discuss its classifications.

Q.2 (a) Answer the following question **4**

- (1) Write a note on Ascending paper chromatography.

Q.2 (b) Answer any two questions out of three. **10**

- (1) Define the term stationary phase and give an outline on stationary phases of paper and thin layer chromatography.
- (2) Give the principle and explain stepwise process for preparation of thin layer chromatographic plate on glass slide.
- (3) Discuss instrumentation of HP-TLC.

Q.3 (a) Answer the following question **4**

- (1) Differentiate between GC and HS-GC.

Q.3 (b) Answer any two questions out of three. **10**

- (1) Write a note on Electron capturedetector (ECD).
- (2) Explain construction and role of injection port in Gas Chromatography.
- (3) Briefly explain following
 - (i) Differentiate between Packed column and Capillary column
 - (ii) Name and ideal characteristics of GC carrier gases

Q.4 (a) Answer the following question **4**

What is Relative Retention Time (RRT)? Calculate the RRT for following data against product peak.

HPLC data table:

Peak	Retention Time (min)	Area	Remarks
1	0.99	1066	Due to diluent
2	1.24	307	Due to diluent
3	3.41	776	Impurity -1
4	7.22	388810	Product peak
5	10.84	2233	Impurity -2
6	15.55	432	Impurity -3

Q.4 (b) Answer any two questions out of three. 10

- (1) Write a note on Refractive Index detector (RI).
- (2) Draw schematic diagram of HPLC, enlist its major components and explain about any two components of the system.
- (3) Explain classification of HPLC systems with brief justification.

Q.5 (a) Answer the following question 4

- (1) Briefly explain the following (i) Digestion (ii) Infusion

Q.5 (b) Answer any two questions out of three. 10

- (1) Give an account of microwave assisted extraction.
- (2) Discuss percolation extraction with figure
- (3) Discuss soxhlet extraction with figure.
