

M.Sc.(Chem.) Semester - 3 (CBCS) Examination
Oct/Nov. -2019 - [NEW COURSE]
Separation Techniques (Core (New))

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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Q1 (A) Answer the following Question **04 Marks**

- 1 Write a note on Eddy Diffusion.

Q1 (B) Answer any two questions out of three **10 Marks**

- 1 What is Retention factor? Enlist factors affecting Retention factor.
- 2 Discuss procedure to perform column chromatography.
- 3 Give the details of following phenomenon
(i) adsorption (ii) Partition

Q2 (A) Answer the following Question **04 Marks**

- 1 Why HPTLC is superior then TLC?

Q2 (B) Answer any two questions out of three **10 Marks**

- 1 Write a note on circular paper chromatography.
- 2 Discuss visualization techniques for chromatography.
- 3 Discuss instrumentation of HPTLC

Q3 (A) Answer the following Question **04 Marks**

- 1 Draw schematic diagram of Thermal conductivity detector.
- 2 Give an account of gases use in Gas chromatography.

Q3 (B) Answer any two questions out of three **10 Marks**

- 1 Discuss Gas chromatography injection port in detail.
- 2 Draw schematic diagram of Head space GC instrument and explain the role of sample incubator and transfer line.
- 3 Write a note on Flame Ionization Detector.

Q4 (A) Answer the following Questions **04 Marks**

- 1 What is guard column? explain its role in HPLC
- 2 Define Peak Asymmetry.

Q4 (B) Answer any two questions out of three **10 Marks**

- 1 Write a note on PDA detector.
- 2 Explain LCMS inter-phase (APESI) with diagram
- 3 Based on following specification; calculate whether sample will pass or fail (Justify the answer briefly)
Specification:

- i) Product purity should not be less than 98.5%
- ii) Any single individual impurity should not be more than 1.5%
- iii) No Impurity should appear between RRT 1.85 to 1.95

HPLC data:

Peak	RT (min)	Area	Remarks
1	0.66	1001	Due to diluent
2	6.55	786	Impurity -1
3	9.14	271019	Product peak
4	11.20	2809	Impurity -2
5	17.44	101	Impurity -3

Q5 (A) Answer the following Question

04 Marks

- 1 What is solvent extraction? Which factors are considered for selection of proper solvent?

Q5 (B) Answer any two questions out of three

10 Marks

- 1 Discuss soxhlet extraction with figure.
- 2 Give an account of microwave extraction and infusion.
- 3 Give an account of supercritical fluid extraction.
