647510 **MSC3AnaC303x** **Seat No :_____**

M.Sc.(Chem.) Semester - 3 (*CBCS*) Examination
Oct/Nov-2021 (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.

Q.1(A)	**Answer the following question**	**(4)**
(1)	Briefly distinguish between normal phase and reverse phase chromatography.	2
(2)	Define: (a) elution (b) mobile phase	2
Q.1(B)	**Answer any two questions out of three.**	**(10)**
(1)	Explain adsorption and partition with figure.	5
(2)	Briefly elucidate eddy diffusion and longitudinal diffusion.	5
(3)	Discuss general characteristics of mobile phase and stationary phase in chromatography.	5
Q.2(A)	**Answer the following question**	**(4)**
(1)	Define R_f and give its equation.	2
(2)	List out the factors that affects the separation of components in paper and thin layer chromatography.	2
Q.2(B)	**Answer any two questions out of three.**	**(10)**
(1)	Explain various visualization techniques used in paper or thin layer chromatography	5
(2)	Write a note on circular paper chromatography.	5
(3)	Explain preparation and activation of traditional TLC plate.	5
Q.3(A)	**Answer the following question**	**(5)**
(1)	Discuss sample preparation and use of head space GC in short.	2
(2)	Which detector is known as universal detector? also name the most commonly used GC detector.	2
Q.3(B)	**Answer any two questions out of three**	**(10)**
(1)	Write a note on flame ionization detector.	5
(2)	Draw schematic diagram of GC and explain role of column and column oven.	5
(3)	Explain isocratic and gradient temperature programming in GC with suitable example.	5
Q.4(A)	**Answer the following question**	**(4)**
(1)	Enlist the applications of HPLC	4

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

(1) Draw schematic diagram of HPLC, enlist its major components and explain about any two components of the system. 5

(2) Explain classification of HPLC systems with brief justification. 5

(3) Calculate and decide, weather sample will pass or fail based on following specifications. 5

1. No peak should appear between RRT 0.60 to 0.95
2. No peak should appear after RRT 1.60
3. Any Individual impurities should be less than 0.1%
4. Total impurity should be less than 0.25%

Peak	Details	RT (min)	Area Under Curve
1	System peak	1.88	3866
2	Impurity 1	3.76	151.5
3	Impurity 2	5.98	195
4	Product peak	11.02	1,91,113
5	Impurity 3	17.01	99.4

Q.5(A) Answer the following question **(4)**

(1) Briefly explain the following (i) Percolation (ii) Maceration 4

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

(1) Give an account of Super critical fluid extraction. 5

(2) Write a note on soxhlet extraction. 5

(3) Name few non-conventional extraction methods, explain any one in detail. 5

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