

**BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE**  
**Pilani-333031. Rajasthan**  
**Second Semester 2022-2023**

**Mid-semester Examination (Closed Book)**

Course Name: Modern Pharmaceutical Analytical Techniques

Course No: PHA G540

Marks: 30

Time: 90 Min

**Note:** Answer for all questions precisely with appropriate illustrations if required.

Give the answer for all sub-parts together in one place.

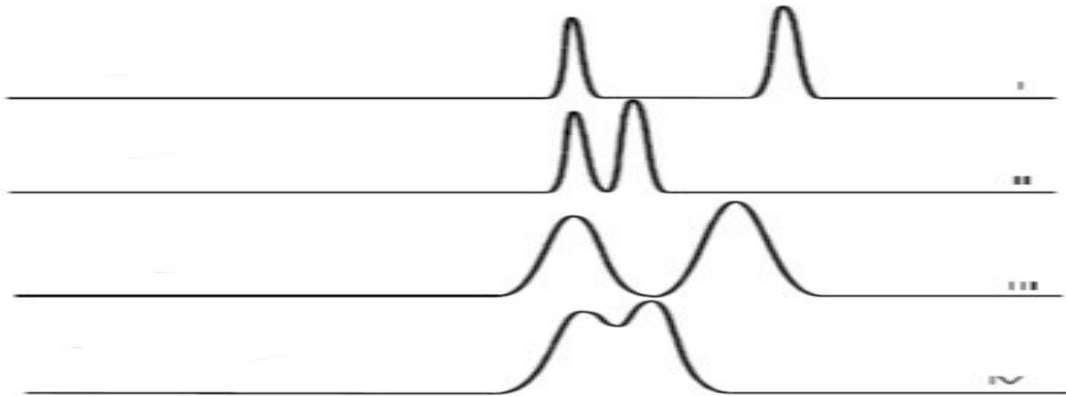
1) a) How will you prepare / pre-treat the given sample of chloramphenicol ointment for appropriate analysis and estimate the content of the same directly. (2X3=6)

b) Explain the role of membranes in sample preparation.

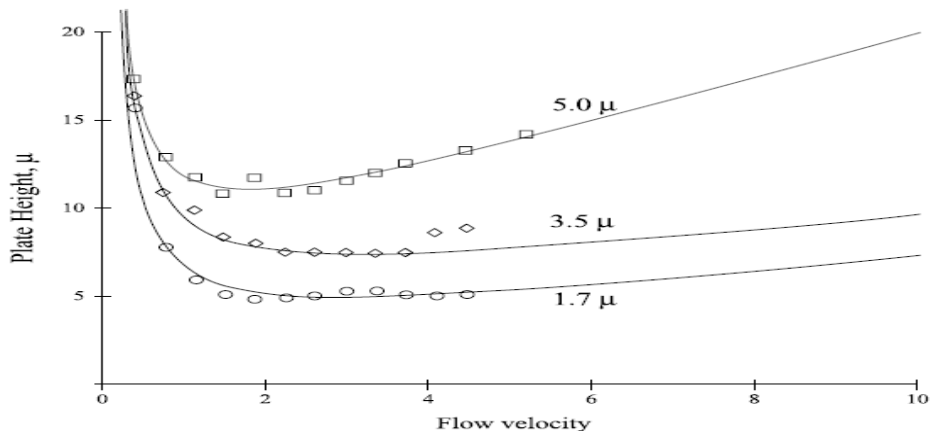
2) a) Write the work flow involved in the appropriate analytical technique mainly used for the separation and purification of a biomolecule with respect to biological function. (2X3=6)

b) Comment on S-Chamber, PEC

3) a) Comment on the following chromatogram with justification, assume column, flow rate, temperature was constant. (2X3=6)



b) Write your appropriate comments with justification correlating the parameters for the given graph.



4) a) Write the inference for the given summary of results obtained during the development of HPTLC method for Echitamine from *Alstonia scholaris* using various methods. **(2X3=6)**

Extraction technique	Echitamine added (ng)	Echitamine recovered (ng)	% Recovery $\pm$ SD (n=3)
Hot percolation	300	312.42	104.14 $\pm$ 9.33
	900	893.63	99.30 $\pm$ 5.48
	1200	1161.59	96.80 $\pm$ 4.49
% Average Recovery $\pm$ SD			100.07 $\pm$ 6.43
Sonication	300	314.32	104.78 $\pm$ 8.38
	900	908.89	100.98 $\pm$ 5.91
	1200	1182.45	98.53 $\pm$ 4.03
% Average Recovery $\pm$ SD			101.43 $\pm$ 6.11
Maceration	300	302.57	100.86 $\pm$ 6.08
	900	887.64	98.63 $\pm$ 1.56
	1200	1200.77	100.06 $\pm$ 3.93
% Average Recovery $\pm$ SD			99.85 $\pm$ 3.86
ARF	300	297.02	99.00 $\pm$ 4.24
	900	882.91	98.10 $\pm$ 3.03
	1200	1178.75	98.23 $\pm$ 5.25
% Average Recovery $\pm$ SD			98.44 $\pm$ 4.37

b) Write the construction, working methodology of Lippich prism.

5) a) What is the enantiomeric excess of a solution with a specific rotation of  $-80$  where the pure solution rotates at  $-140$ ? For the above same solution, how much of the  $(-)$  and  $(+)$  enantiomers are present? **(3X2=6)**

b) A spring is displaced by 5 cm and held in place with a force of 500 N. What is the spring constant of the spring according to Hooke's law?

c) W.r.t IR, comment on the following,

i) Effect of conjugation on the frequency of C=O absorption.

ii) Impact of Hydrogen bonding on the absorption frequency of carbonyl group.

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