DBJ-003-1103001 Seat No. _____

M. Sc. (Sem. III) Examination

June - 2022

Chemistry : C-301

(Advance Chromatographic Techniques)

(New Course)

Faculty Code : 003

Subject Code : 1103001

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions carry equal marks.

(2) Answer any five questions.

1 Answer the following : **14**

(a) Draw the block diagram of HPTLC and write their functioning.

(b) Define hypnenated techniques. Give their name and mention advantages of them.

(c) Define : Elution, isocratic and gradient elution.

(d) Enlist the column used in GC and discuss any one.

(e) Explain voide volume and eleution volume in exclusion chromatography.

(f) Enlist the application of LC-MS and discuss any one.

(g) Briefly discuss the properties of SFC.

2 Answer the following : **14**

(a) Explain the term Gel-chromatography.

(b) Give brief note on cation exchanger.

(c) What is the importance of mobile phase selection in HPLC ?

(d) Write the classification of chromatography.

(e) Give the principle of gas-chromatography and its advantages.

(f) Differentiate normal phase and reverse phase chromatography.

(g) Write the principle of adsorption and partition chromatography and give the examples each of them.

3 Answer the following : **14**

(a) Describe any two detectors used in gas chromatography.

(b) Discuss advantages of SFC over HPLC and its limitations.

4 Answer the following : **14**

(a) Enlist the difficulties aries in coupling of GC with MS. Discuss the John-membrane separator interface device of GC-MC.

(b) Explain the principle of liquid chromatography. Draw the labelled diagram of HPLC instrument and give the function of each.

5 Answer the following : **14**

(a) Define number of theoretical plates and plate heights. If retention time is 407 S, base width of the band is 13 S, column length is 12.2 m them find the number of plates and plate height.

(b) What is resolution ? Derive relation between plate numbers and resolution.

6 Answer the following : **14**

(a) Discuss the general characteristics of stationary phase and mobile phase for planner chromatography.

(b) Give a brief account on atmospheric pressure chemical ionization (APCI).

7 Answer the following : 14

(a) Enlist the detector used in HPLC and discuss PDA in detail.

(b) What are mass analyzer ? Discuss TQM in detail.

8 Answer the following : 14

(a) Write the application of ion exchange chromatography in detail.

(b) What is Super critical fluid chromatography ? Discuss it's advantage and disadvantage.

9 Answer the following : 14

(a) Draw the hypothetical chromatogram and explain the information it gives.

(b) Draw the schematic diagram of LC-NMR and write the function of each component.

10 Answer the following : 14

(a) Discuss the pre and post chromatographic steps in HPTLC.

(b) What are the different name of gel-chromatography ? Discuss gel chromatography in details.