



Seat No. \_\_\_\_\_

**HAJ-003-1103001**

**M. Sc. Chemistry (Sem.-III) (CBCS)**

**Examination**

**May - 2023**

**C-301 : Advance Chromatographic Techniques**

**Faculty Code : 003**

**Subject Code : 1103001**

Time :  $2\frac{1}{2}$  Hours / Total Marks : 70

- Instructions :**
- (1) All questions are compulsory.
  - (2) All questions carry equal marks.

**1** Answer the following : (any **seven**)

- (a) Define the terms  $R_{st}$ ,  $hR_f$ , elution and eluent.
- (b) Enlist the column and detector used in SFC.
- (c) Explain degassing system in HPLC.
- (d) Define the term interface with its importance.
- (e) Explain ion exchangers with their names.
- (f) Define total volume of gel bead ( $V_t$ ) and solvent volume ( $V_i$ ) inside the gel particles.
- (g) Enlist the development techniques for planar chromatography and explain any one.
- (h) How does gas chromatography work ?
- (i) How will you determine molecular weight by gel chromatography ?
- (j) Give the names of column used in GC and HPLC. Discuss any one of them.

**2** Answer the following : (any **two**)

- (a) Discuss with diagram the instrumentation of HPLC.
- (b) Discuss the pre and post chromatographic steps in HPTLC.
- (c) Explain quadrupole and TQM mass analyzers in detail.

**3** Answer the following :

- (a) Discuss the plate theory with example in chromatography.
- (b) Enlist the interface used in GC-MS. Discuss Watson Biemann effusion separator in detail.

**OR**

- (a) Discuss the importance of chamber saturation in planar chromatography.
- (b) What are the requirements of detectors in HPLC ? Explain any two detectors used in HPLC.

**4** Answer the following :

- (a) Draw the schematic diagram of GC instrument. Write the name of each component and discuss any one of them.
- (b) Give the various names of gel chromatography. Discuss gel filtration technique in detail.

**5** Answer the following : (any **two**)

- (a) Enlist the matrix used in SFC and discuss the advantages of CO<sub>2</sub> as an SFC matrix better than another matrix.
- (b) How HPLC is superior to TLC and HPLC ? Discuss in detail.
- (c) Describe the various types of matrices used in ion exchange chromatography.
- (d) Discuss applications of gas chromatography.

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