



DN-003-1104004

Seat No. _____

M. Sc. (Sem. IV) (CBCS) Examination

March / April - 2022

(CPA) & (CPM) 402 : Chemistry

(Instrumental Techniques)

(New Course)

Faculty Code : 003

Subject Code : 1104004

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) **14**
- (a) Define x-ray absorption, x-ray diffraction and x-ray fluorescence methods and give its importance.
 - (b) Give the miscellaneous application of x-ray diffraction.
 - (c) State the principle of TGA and DTA.
 - (d) Draw a hypothetical DSC thermogram and label the transitions.
 - (e) What is polarization ? Explain linear and circularly polarization.
 - (f) What is optical activity ? Give its example.
 - (g) Give the application of scanning electron microscopy.
 - (h) Give the principle of transmission electron microscopy.
 - (i) Give the advantages of automation.
 - (j) Give the classification of automatic analyzer.
- 2** Answer the following : (any two) **14**
- (a) Give the x-ray diffraction methods and discuss law method in detail.
 - (b) Discuss powder crystal method in detail.
 - (c) Give the application of x-ray diffraction method.

- 3 Answer the following : 14
- (a) Discuss the various physical and chemical properties evaluated by DSC methods. State the various field of chemistry in which this techniques are used.
 - (b) What is optical rotatory dispersion ? Discuss theory and instrumentation of it.

OR

- 3 Answer the following : 14
- (a) What are the various factors affecting DTA ? Give the application, advantages and disadvantages of DTA.
 - (b) Discuss with diagram circular dichroism and give advantages and dis-advantages of in its.
- 4 Answer the following : 14
- (a) Explain the theory of transmission electron microscopy.
 - (b) Explain instrumentation of scanning electron microscopy.
- 5 Answer the following : (any two) 14
- (a) Give the principle of organic elemental analyzer and explain the analysis procedure with diagram.
 - (b) What is flow injection analysis technique ? Discuss in detail with suitable example.
 - (c) Write note on usefulness of DSC and TGA in the field of chemistry.
 - (d) Discuss Bragg x-ray spectrometer method in detail.
