DN-003-1104002 Seat No. _____

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

March / April - 2022

(CPA) & (CPM) 402 : Chemistry

(Instrumental Techniques)

(New Course)

Faculty Code : 003

Subject Code : 1104002

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 fluorercence 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.
