



BBB-003-1104002-1104004 Seat No. _____

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

June / July - 2021

C(PA) & C(PM) 402 : Chemistry

(Instrumental Techniques (2017))

(New Course)

Faculty Code : 003

Subject Code : 1104002-1104004

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) All questions carry equal marks.
(2) Attempt any five questions out of ten.

- 1** Answer the following : **14**
- (a) Define : X-ray absorption, X-ray diffraction and X-ray fluorescence.
 - (b) How will you measure λ and d by Bragg's law ?
 - (c) What is polaroid ? How these are constructed and give their uses.
 - (d) Draw a hypothetical DSC curve and label various types of transitions.
 - (e) Differentiate automatic and automated methods of chemical analysis.
 - (f) Give the principle of scanning electron microscopy.
 - (g) Define : Topography and morphology.
- 2** Answer the following : **14**
- (a) How will you determine state of anneal in metals by X-ray diffraction ?
 - (b) Define : Optical activity and polarized light.
 - (c) What is full form of DTA ? Draw and interpret DTA thermogram.
 - (d) List the steps of unit operations in chemical analysis.
 - (e) Define polarimetry and list their applications.
 - (f) Define circular polarized light and plane polarized.
 - (g) How will you determine linkage isomerism by X-ray diffraction ?

- 3 Answer the following : 14
(a) Discuss the theory of transmission electron microscopy.
(b) Explain with diagram the instrumentation of scanning electron microscopy.
- 4 Answer the following : 14
(a) Give the X-ray diffraction methods and discuss Laue method in detail.
(b) Give an account of application of X-ray diffraction method.
- 5 Answer the following : 14
(a) Give the principle of analysis based upon multilayer films. How will you analyze glucose in blood sample ?
(b) Give the principle of flow injection analysis and discuss the measurement of mercury by this technique.
- 6 Answer the following : 14
(a) Discuss the factors affecting DTA.
(b) Discuss the principle and working of TGA technique.
- 7 Answer the following : 14
(a) What is circular dichroism ? Discuss theory and instrumentation of it.
(b) What is optical rotatory dispersion ? Discuss theory and instrumentation of it.
- 8 Answer the following : 14
(a) Explain the instrumentation of transmission electron microscopy.
(b) Discuss the effect of various operating parameters in thermal analysis.
- 9 Answer the following : 14
(a) Discuss powder crystal method in detail.
(b) Describe Bragg X-ray spectrometer method in detail.
- 10 Answer the following : 14
(a) Discuss the principle and working of DSC.
(b) Give the principle of automatic organic elemental analyzer. Discuss the functioning of it with diagram.