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MBT-003-1104002

Seat No. _____

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

April / May- 2018

C(PM)-402 & C(PA)-402 : Instrumental Techniques

(Physical & Material Chemistry Pharma - Analytical Chemistry)

(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**)

(a) Define: X-ray absorption, Morphology, Optical activity, Thermal analysis.

(b) Give the principle of flow injection analysis.

(c) Give a brief account of determination of linkage isomerism by X-ray diffraction.

(d) Draw a hypothetical DSC curve and label various types of transitions.

(e) State the various- applications of X-ray diffraction.

(f) Give the advantage and disadvantage of automatic analysis.,

(g) What are the advantages and disadvantages of DTA?

(h) Give the principle of transmission electron microscope.

(i) What is 'Polaroid? Haw these are constructed? Give their uses.

(j) Give an account of applications of scanning electron microscopy.

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

(a) Discuss ORD and cotton effect

(b) Explain instrumentation of transmission electron microscope.

(c) Describe the factors affecting thermal analysis.

(d) Explain Laue's method in detail

3 (a) Describe the principle and instrumentation, of automatic organic elemental analyzer.

(b) What are the physical and chemical properties determined by DSC? Explain.

OR

3 (a) What is enantiomeric excess? What is the enantiomeric excess of a mixture containing 25% (+)-2-butanol and 75% (–)–2-butanol, if the specific rotation of (+)-2-butanol, is 13.5.

(b) Discuss the separations in flow injection analysis.

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

(a) Explain Bragg's method.

(b) Give an account of unit operation in a -chemical analysis. Explain the determination of blood urea nitrogen by multilayer film technique.

(c) State the different methods of single heating rate for the determination of kinetic parameters, by TGA. Give equation for any one of them with significance of all the terms involved in it.

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

(a) Discuss the working of TGA and DTA.

(b) Describe the flow injection determination of chloride with instrumentation.

(c) Discuss optical rotation dispersion spectroscopy.

(d) Give an account of powder crystal method.