Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(Chemistry) (2015 to 2017) (Sem.–4)

ANALYTICAL PRINCIPLES & INSTRUMENTAL METHOD OF ANALYSIS

Subject Code : MSCH-403

M.Code : 71678

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt FIVE questions in ALL including COMPULSORY questions No. 1.
2. Select at least ONE question from I-IV UNIT.
3. All questions carry equal marks.

1. Answer briefly :

(a) Define the term 'Thermo-Metric Gravimetry'.

(b) Discuss the importance of sensitivity and noise in data handling.

(c) Describe the significance of 'voltametry'.

(d) Discuss the applications of supercritical fluid chromatography.

(e) Why only X-rays are used for the crystal structure determination?

(f) Describe Bragg's law.

(g) Why the magnifying power of electron microscope is very high in comparison to an optical microscope?

(h) What is the magnetic moment of neutron?

(i) Describe the term 'SAED'.

(j) Discuss the term scanning probe microscopy.

UNIT-I

2. Explain *'differential scanning calorimetry'* technique for the characterization of materials. With a labeled sketch of DSC, explain its working.

3. Discuss the importance of analytical methods in qualitative and quantitative analysis. Discuss the significance of computer aided analysis.

UNIT-II

4. Discuss the principle and Instrumentation used in supercritical fluid chromatography. Discuss the applications of SFC.

5. Write short note on :

   (a) Cyclic Voltammetry

   (b) Coulometry

   (c) Potentiometry

   (d) Polarography

UNIT-III

6. What is the importance of crystal structure determination in materials? Discuss the various methods in detail for the structure determination using X-ray diffraction.

7. With a general diagram of Transmission electron microscope, explain the function of various components. Discuss how it can be used for characterizing the materials.

UNIT-IV

8. Discuss the elementary theory of neutron diffraction. How it can be used for hydrogen containing compounds? Discuss its limitations also.

9. Discuss how electron diffraction is used for the molecular studies. Discuss its limitations also.

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.