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

Paper ID : [A2810]

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.

1. Answer briefly :

a) Give advantages of instrumental methods of analysis.

b) What is noise? Discuss its sources.

c) What are the factors affecting TGA curves?

d) What effect does complexation have on the voltammetric reduction of a metal ion?

e) What is a chemically modified electrode?

f) Give a comparison of SFC with HPLC.

g) The first maxima for Bragg diffraction of X-rays from KCI crystal (d = 0.314nm) appears at 14°. Calculate the energy of incident X-rays.

h) What are Miller indices?

i) Explain the neutron diffraction pattern of MnO.

j) What is the principle of diffraction? (10×2=20)

UNIT-I

2. Write short notes on the following :

   a) Sensitivity b) Detection limit

   c) Error d) Standard deviation (4×5=20)

3. Discuss in detail the TGA and DTA methods of analysis. (20)

UNIT-II

4. Discuss the basic principle, instrumentation and applications of cyclic voltammetry. (20)

5. Discuss the basic principle, instrumentation and applications of HPLC. (20)

UNIT-III

6. Discuss the basic principle, instrumentation and applications of SEM and TEM. (20)

7. Write short notes on the following :

   a) Crystal shapes and Miller indices.

   b) Bragg's law.

   c) Fourier synthesis. (6,6,8)

UNIT-IV

8. Discuss the theory of neutron diffraction. How it is applied for the study of hydrogen containing compounds and magnetism? (20)

9. Discuss the theory, applications and limitations of electron diffraction method of analysis. (20)