

Total No. of Questions :6]

SEAT No. :

[Total No. of Pages :3

P1879

[5223] - 316

M.Sc. -II

ANALYTICAL CHEMISTRY

CHA-392: Advanced Analytical Techniques

(2013 Pattern) (Credit System) (Semester - III)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.*
- 2) All questions are compulsory.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Use of logarithmic table / non programmable calculator is allowed.*

SECTION-I

Q1) Answer the following questions:

[10]

- a) What is emulsion in liquid - liquid extraction?
- b) Give the stages of solid phase extraction.
- c) Name the component present in microwave system.
- d) Give the operating conditions for MAE.
- e) Give the applications of SFE.

Q2) Attempt any two of the following:

[10]

- a) Explain major components of SPE instrumentation with diagram.
- b) What is liquid-liquid extraction? Explain the theory of liquid - liquid extraction.
- c) What is microwave assisted extraction? Explain its theoretical basis.
- d) Explain the advantages of CO₂ supercritical fluid.

P.T.O.

Q3) Attempt any one of the following: **[5]**

- a) Explain applications of MAE.
- b) Give the applications of SFE.

SECTION-II

Q4) Attempt the following: **[10]**

- a) What is Resonant Ionisation Spectroscopy [RIS]?
- b) State two application of AES.
- c) Explain the effect of temperature on FES.
- d) Explain the term mass to charge ratio.
- e) What is direct current plasma emission spectroscopy?

Q5) Attempt any two of the following: **[10]**

- a) What is mass analyzer? Explain the construction and working of quadrupole mass analyzer.
- b) Mention the importance of micronutrients for the growth of plants. Explain the estimation of Boron from soil sample.
- c) State the principle of AAS and explain its instrumentation with block diagram.
- d) Enlist the sources used in atomic Fluorescence Spectroscopy. Explain any one in detail.

Q6) Solve any one of the following

[5]

- a) In determination of Mn at 403.3 nm the analyte gives a meter reading 45. The analyte solution with 100 $\mu\text{g/ml}$ of standard Mn gives meter reading 83.5. Calculate the amount of Mn in analyte.
- b) A soil sample was analysed for determination of Fe at 535 nm in air-acetylene flame by AAS. The observation is as follows:

Fe (ppm)	0.0	0.1	0.2	0.3	0.4	0.5	Sample
Absorbance	0.004	0.032	0.065	0.098	0.131	0.164	0.078

Determine the concentration of Fe in sample.

EEE