

SEMESTER-III

Paper S-3054

Special methods of analysis

Time: 3 Hrs.

M.M. 75 marks

Note: The paper will be divided into two sections.

Section-A One question with 10 parts (short answer word limit 20) spread over whole syllabus. Each part will be of 1 mark and candidate is required to attempt all the ten parts

Total 10 marks

Section-B Five questions (answer not exceeding 500 words) are from each Unit with internal choice will be asked and the candidate is required to attempt all five questions. Each question will be of 13 marks

Total 65 marks

Unit-I

Thermo Gravimetric analysis (TGA) and derivative thermo gravimetric (DTG): Principle, Instrumentation and applications, factor affecting TG curves.

Differential thermal analysis (DTA): Principle, Instrumentation and applications, factor influencing TA curves.

Differential screening colorimeter (DSC): Principle, Instrumentation and applications, factor influencing DC curves, comparison with DTA.

Unit-II

D.C. Polarography: Basic principle, types of currents, experimental technique, Ilkovic equation (no derivation) and application of polarography.

Principle, technique and application of

(i) Voltammeter and cyclic voltmeter

(ii) Amperometry

(iii) Anodic stripping voltammeter

Unit-III

High performance liquid chromatography (HPLC): Introductory knowledge of adsorption, basic principle, instrumentation and application of HPLC, comparisons with gas liquid chromatography.

Gas liquid chromatography: Principle instrumentation and application.

Gel permeation or size exclusion chromatography: Introduction theory and application.

Unit-IV

Ion Exchange: Introduction, type- cationic, anionic, chelating and liquid ion exchangers, preparation action and properties of exchangers and application of ion exchangers.

Solvent extraction: ion association complexes.

Zone Electrophoresis: Introduction factor affecting ionic migration, detection of separated components and application of zone electrophoresis.

Unit-V

Radioactive technique: Tracer technique, neutron activation analysis, counting technique such as Geiger-Muller, ionization and proportional counters.

Light scattering techniques: Principal, instrumentation and application of nephelometry and Raman spectroscopy.

