

SVKM's NMIMS University

Mukesh Patel School of Technology Management & Engineering, Mumbai

Department of Basic Sciences and Humanities

Syllabus for PhD Entrance Test

Effective from May, 2026

SECTION- A

Section A will include 25 compulsory objective-type questions, each carrying 2 marks. It will be focused on research aptitude. The section will be general in nature and aims to evaluate the candidate's research aptitude, with emphasis on reasoning ability, data interpretation, and quantitative skills.

SECTION-B

Section B will comprise 25 compulsory objective-type questions, each carrying 2 marks, based on the following syllabus:

Unit I: Organic Reaction mechanisms, reaction intermediates, Common name reactions

Unit II: Organic transformations and reagents, Retrosynthesis, disconnection, synthons, linear and convergent synthesis, umpolung of reactivity and protecting groups, chemistry of heterocycles

Unit III: Transition elements and coordination compounds: structure, bonding theories, spectral and magnetic properties, reaction mechanisms.

Unit IV: Concepts of acids and bases, Hard-Soft acid base concept, Non-aqueous solvents.

Unit V: Organometallic compounds- synthesis, bonding and structure, and reactivity. Organometallics in homogeneous catalysis, green chemistry

Unit VI: Polymer chemistry

Unit VII: Characterization of inorganic compounds by IR, Raman, NMR, EPR, Mössbauer, UV-vis, NQR, MS, electron spectroscopy and microscopic techniques.

Unit VIII: Molecular spectroscopy, Reaction Kinetics, Electrochemistry, colloids and surfaces and Solid State Chemistry