

Non-Teaching Staff Recruitment
(Advertisement No. IITT/STAFFREC/01/2025 dated 14-07-2025)

Syllabus - Junior Technician (Chemical Engineering)

Level-I: Objective Test

Fluid Mechanics: Orifice meter, Venturi meter, Rotameter, Reynold's experiment, terminal settling velocity, Types of valves, Manometers, Types of pumps, Emptying of tanks, properties of water & air, compressors and vacuum pumps.

Heat Transfer: Types of thermometers and their principle of working, Fourier's law of heat conduction, Double pipe heat exchanger, Newton's law of cooling, Shell and Tube heat exchanger, natural convection principle, heat transfer by radiation and applicable laws.

Mass Transfer: Fick's laws, Molecular diffusion in fluids and gases, Mass transfer coefficients, Design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying and adsorption.

Chemical Reaction Engineering: Rate of reaction, order, rate constant; Design principles and analysis of batch reactors and ideal flow reactors.

Safety: Various symbols used to classify chemicals, gases & liquids, colour codes for marking various zones in a chemical lab, pressure relief valves, HAZOP related definitions.

General Aptitude: Analytical and logical reasoning.

Level-II: Descriptive Test

(Detailed answers, Solutions to Numerical Problems, etc.).

Fluid Mechanics: Orifice meter, Venturi meter, Rotameter, Reynold's experiment, terminal settling velocity, Types of valves, Manometers, Types of pumps, friction factor, Emptying of tanks, properties of water & air, compressors and vacuum pumps.

Heat Transfer: Types of thermometers and their principle of working, Fourier's law of heat conduction, Double pipe heat exchanger, Newton's law of cooling, Shell and Tube heat exchanger, natural convection principle, heat transfer by radiation and applicable laws.

Mass Transfer: Fick's laws, Molecular diffusion in fluids and gases, Mass transfer coefficients, Design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption.

Chemical Reaction Engineering: Fundamentals of Catalysts, Catalytic rates, Reaction mechanisms; Yield and Selectivity; Fundamentals of Reactor design for ideal flow reactors.

Safety: Various symbols used to classify chemicals, gases & liquids, color codes for marking various zones in a chemical lab, pressure relief valves, HAZOP related definitions.

Level-III: Trade test (Qualifying in nature)

Fluid Mechanics: Identification of various flow measuring devices and parts, Identification of types of valves, Identification of various types of pumps

Heat Transfer: Identification of various types of thermometers, Identification of various types of heat exchangers

Mass Transfer: Identification of various mass transfer equipment

Chemical Reaction Engineering: Identification of Reactors

Safety: Identification of Various symbols used to classify chemicals, gases & liquids, color codes for marking various zones in a chemical lab

Selection Criteria:

- Level-I : Objective Based Test (Level-I is a screening test to call a reasonable number of candidates for the Level-II & Level-III tests.)
- Level-II : Descriptive Test
- Level-III : Skill/Trade Test

Note: All the tests will be conducted based on the above-mentioned syllabus. Equal weightage shall be given to Level-I and Level-II tests for the purpose of preparing the merit list. The Level-III test will be qualifying in nature (Pass/Fail).
