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GATE-2024

# ONLINE TEST SERIES

## SCHEDULE - CHEMICAL ENGINEERING

Number of Tests

| Topic Wise | Subject Wise | Mock Test | MSQ | Total |
|---|---|---|---|---|
| 40 | 22 | 12 | 10 | 84 |

## TOPIC WISE TESTS

- Each test carries 25 marks and 45 minutes duration
- Test consists of 5 one mark questions and 10 two marks questions

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| CH-01 | **Basic Level Process Calculations :** Steady and unsteady state mass and energy balances including multiphase, multicomponent, reacting and non reacting systems. Use of tie components: recycle bypass purge calculations: Gibbs phase rule and degree of freedom analysis. | Available Now |
| CH-02 | **Basic Level Thermodynamics-1 :** First and Second law of thermodynamics. Application of first law to close and open system(compressor turbine nozzles etc), Second law and Entropy. Equation of states | Available Now |
| CH-03 | **Basic Level Thermodynamics-2 :** Thermodynamics properties of pure substances, Residual properties, properties of mixture, partial molar properties, fugacity, excess properties and activity coefficients, phase equilibria, predicting VLE of systems, chemical reaction equilibrium. | Available Now |
| CH-04 | **Basic Level Chemical Technology-1 :** Inorganic chemical industries (sulfuric acid, phosphoric acid, chlor-alkali industry), fertilizers (Ammonia, Urea, SSP and TSP); | Available Now |
| CH-05 | **Basic Level Chemical Technology-2 :** Natural products industries (Pulp and Paper, Sugar, Oil, and Fats); petroleum refining and petrochemicals; polymerization industries (polyethylene, polypropylene, PVC and polyester synthetic fibers). | Available Now |
| CH-06 | **Basic Level Fluid Mechanics :** Fluid statics, Newtonian and non-Newtonian fluids, shell-balances including differential form of Bernoulli equation and energy balance, Macroscopic friction factors, dimensional analysis and similitude, flow through pipeline systems, flow meters, pumps and compressors, elementary boundary layer theory, flow past immersed bodies including packed and fluidized beds, Turbulent flow: fluctuating velocity, universal velocity profile and pressure drop. | Available Now |
| CH-07 | **Basic Level Mechanical Operation :** Particle size and shape, particle size distribution, size reduction and classification of solid particles; free and hindered settling; centrifuge and cyclones; thickening and classification, filtration, agitation and mixing; conveying of solids | Available Now |
| CH-08 | **Basic Level Heat Transfer-1 :** Steady and unsteady heat conduction, convection and radiation, thermal boundary layer and heat transfer coefficients. | Available Now |
| CH-09 | **Basic Level Heat Transfer-2 :** Boiling, condensation and evaporation; types of heat exchangers and evaporators and their process calculations. Design of double pipe, shell and tube heat exchangers, and single and multiple effect evaporators. | Available Now |
| CH-10 | **Basic Level Mass Transfer-1:** Fick's laws, molecular diffusion in fluids, mass transfer coefficients, film, penetration and surface renewal theories; momentum, heat and mass transfer analogies; stage-wise and continuous contacting and stage efficiencies; HTU & NTU concepts humidification, dehumidification. | Available Now |

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| CH-11 | **Basic Level Mass Transfer - 2 :** Design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption. | Available Now |
| CH-12 | **Basic Level Chemical Reaction Engineering - 1 :** Theories of reaction rates; kinetics of homogeneous reactions, interpretation of kinetic data, single and multiple reactions in ideal reactors, residence time distribution, single parameter model; non-isothermal reactors; | Available Now |
| CH-13 | **Basic Level Chemical Reaction Engineering - 2 :** Non-ideal reactors, Kinetics of heterogeneous catalytic reactions; diffusion effects in catalysis. | Available Now |
| CH-14 | **Basic Level Instrumentation and Process Control-1 :** Measurement of process variables; sensors, transducers and their dynamics, process modeling and linearization, transfer functions and dynamic responses of various systems, systems with inverse response, process reaction curve. | Available Now |
| CH-15 | **Basic Level Instrumentation and Process Control - 2 :** Controller modes (P, PI, and PID); control valves; analysis of closed loop systems including stability, frequency response, controller tuning, cascade and feed forward control. | Available Now |
| CH-16 | **Basic Level Plant Design and Economics :** Optimization in process design and sizing of chemical engineering equipments such as compressors, heat exchangers, multistage contactors.<br>Principles of process economics and cost estimation including depreciation and total annualized cost, cost indices, rate of return, payback period, discounted cash flow. | Available Now |
| CH-17 | **Basic Level Engineering Mathematics - 1 :**<br>**Linear Algebra:** Matrix Algebra, Systems of linear equations, Eigenvalues, Eigenvectors.<br>**Calculus**: Mean value theorems, Theorems of integral calculus, Evaluation of definite and improper integrals, Partial Derivatives, Maxima and minima, Multiple integrals, Fourier series, Vector identities, Directional derivatives, Line integral, Surface integral, Volume integral, Stokes's theorem, Gauss's theorem, Green's theorem.<br>**Differential equations:** First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's equation, Euler's equation, Initial and boundary value problems, Partial Differential Equations, Method of separation of variables. | Available Now |
| CH-18 | **Basic Level Engineering Mathematics - 2 :**<br>**Complex variables:** Analytic functions, Cauchy's integral theorem, Cauchy's integral formula, Taylor series, Laurent series, Residue theorem, Solution integrals.<br>**Probability and Statistics:** Sampling theorems, Conditional probability, Mean, Median, Mode, Standard Deviation, Random variables, Discrete and Continuous distributions, Poisson distribution, Normal distribution, Binomial distribution, Correlation analysis, Regression analysis.<br>**Numerical Methods**: Solutions of nonlinear algebraic equations, Single and Multi-step methods for differential equations.<br>**Transform Theory:** Fourier Transform, Laplace Transform, z-Transform. | Available Now |
| CH-19 | **Basic Level General Aptitude - 1 :** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction | Available Now |
| CH-20 | **Basic Level General Aptitude - 2 :** Numerical computation, numerical estimation, numerical reasoning and data interpretation | Available Now |

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| CH-21 | **Advance Level Process Calculations :** Steady and unsteady state mass and energy balances including multiphase, multicomponent, reacting and non reacting systems. Use of tie components: recycle bypass purge calculations: Gibbs phase rule and degree of freedom analysis. | Available Now |
| CH-22 | **Advance Level Thermodynamics - 1 :** First and Second law of thermodynamics. Application of first law to close and open system(compressor turbine nozzles etc), Second law and Entropy. Equation of states. | Available Now |
| CH-23 | **Advance Level Thermodynamics - 2 :** Thermodynamics properties of pure substances, Residual properties, properties of mixture, partial molar properties, fugacity, excess properties and activity coefficients, phase equilibria, predicting VLE of systems, chemical reaction equilibrium. | Available Now |
| CH-24 | **Advance Level Fluid Mechanics :** Fluid statics, Newtonian and non-Newtonian fluids, shell-balances including differential form of Bernoulli equation and energy balance, Macroscopic friction factors, dimensional analysis and similitude, flow through pipeline systems, flow meters, pumps and compressors, elementary boundary layer theory, flow past immersed bodies including packed and fluidized beds, Turbulent flow: fluctuating velocity, universal velocity profile and pressure drop. | Available Now |
| CH-25 | **Advance Level Mechanical Operation :** Particle size and shape, particle size distribution, size reduction and classification of solid particles; free and hindered settling; centrifuge and cyclones; thickening and classification, filtration, agitation and mixing; conveying of solids. | Available Now |
| CH-26 | **Advance Level Heat Transfer - 1 :** Steady and unsteady heat conduction, convection and radiation, thermal boundary layer and heat transfer coefficients. | Available Now |
| CH-27 | **Advance Level Heat Transfer - 2 :** Boiling, condensation and evaporation; types of heat exchangers and evaporators and their process calculations. Design of double pipe, shell and tube heat exchangers, and single and multiple effect evaporators. | Available Now |
| CH-28 | **Advance Level Mass Transfer - 1 :** Fick's laws, molecular diffusion in fluids, mass transfer coefficients, film, penetration and surface renewal theories; momentum, heat and mass transfer analogies; stage-wise and continuous contacting and stage efficiencies; HTU & NTU concepts humidification, dehumidification. | Available Now |
| CH-29 | **Advance Level Mass Transfer - 2 :** Design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption. | Available Now |
| CH-30 | **Advance Level Chemical Reaction Engineering - 1 :** Theories of reaction rates; kinetics of homogeneous reactions, interpretation of kinetic data, single and multiple reactions in ideal reactors, residence time distribution, single parameter model; non-isothermal reactors; | Available Now |
| CH-31 | **Advance Level Chemical Reaction Engineering - 2 :** Non-ideal reactors, Kinetics of heterogeneous catalytic reactions; diffusion effects in catalysis. | Available Now |
| CH-32 | **Advance Level Instrumentation and Process Control -1 :** Measurement of process variables; sensors, transducers and their dynamics, process modeling and linearization, transfer functions and dynamic responses of various systems, systems with inverse response, process reaction curve. | Available Now |
| CH-33 | **Advance Level Instrumentation and Process Control - 2 :** Controller modes (P, PI, and PID); control valves; analysis of closed loop systems including stability, frequency response, controller tuning, cascade and feed forward control. | Available Now |
| CH-34 | **Advance Level Plant Design and Economics - 1 :** Optimization in process design and sizing of chemical engineering equipments such as compressors, | Available Now |

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| | heat exchangers, multistage contactors, Principles of process economics and cost estimation including depreciation and total annualized cost, cost indices, rate of return, payback period, discounted cash flow. | |
| CH-35 | **Advance Level Plant Design and Economics - 2 :** Optimization in process design and sizing of chemical engineering equipments such as compressors, heat exchangers, multistage contactors, Principles of process economics and cost estimation including depreciation and total annualized cost, cost indices, rate of return, payback period, discounted cash flow. | Available Now |
| CH-36 | **Advance Level Chemical Technology :** Inorganic chemical industries (sulfuric acid, phosphoric acid, chlor-alkali industry), fertilizers (Ammonia, Urea, SSP and TSP); natural products industries (Pulp and Paper, Sugar, Oil, and Fats); petroleum refining and petrochemicals; polymerization industries (polyethylene, polypropylene, PVC and polyester synthetic fibers). | Available Now |
| CH-37 | **Advance Level Engg. Mathematics - 1 :**<br>**Linear Algebra:** Matrix Algebra, Systems of linear equations, Eigenvalues, Eigenvectors.<br>**Calculus**: Mean value theorems, Theorems of integral calculus, Evaluation of definite and improper integrals, Partial Derivatives, Maxima and minima, Multiple integrals, Fourier series, Vector identities, Directional derivatives, Line integral, Surface integral, Volume integral, Stokes's theorem, Gauss's theorem, Green's theorem.<br>**Differential equations:** First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's equation, Euler's equation, Initial and boundary value problems, Partial Differential Equations, Method of separation of variables. | Available Now |
| CH-38 | **Advance Level Engg. Mathematics - 2 :**<br>**Complex variables:** Analytic functions, Cauchy's integral theorem, Cauchy's integral formula, Taylor series, Laurent series, Residue theorem, Solution integrals.<br>**Probability and Statistics:** Sampling theorems, Conditional probability, Mean, Median, Mode, Standard Deviation, Random variables, Discrete and Continuous distributions, Poisson distribution, Normal distribution, Binomial distribution, Correlation analysis, Regression analysis.<br>**Numerical Methods**: Solutions of nonlinear algebraic equations, Single and Multi-step methods for differential equations.<br>**Transform Theory:** Fourier Transform, Laplace Transform, z-Transform. | Available Now |
| CH-39 | **Advance Level General Aptitude - 1 :** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction. | Available Now |
| CH-40 | **Advance Level General Aptitude - 2 :** Numerical computation, numerical estimation, numerical reasoning and data interpretation. | Available Now |

# SUBJECT WISE TESTS

- Each test carries 50 marks and 90 minutes duration.
- Test consists of 10 one mark questions and 20 two marks questions

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| CH-41 | **Basic Level Process Calculations & Thermodynamics :** Steady and unsteady state mass and energy balances including multiphase, multi-component, reacting and non -reacting systems. Use of tie components; recycle, bypass and purge calculations; Gibb's phase rule and degree of freedom analysis. First and Second laws of thermodynamics. Applications of first law to close and open systems. Second law and Entropy. Thermodynamic properties of pure substances: Equation of State and residual properties, properties of mixtures: partial molar properties, fugacity, excess properties and activity coefficients; phase equilibria: predicting VLE of systems; chemical reaction equilibrium. | Available Now |
| CH-42 | **Basic Level Fluid Mechanics & Mechanical Operation :** Fluid statics, Newtonian and non-Newtonian fluids, shell-balances including differential form of Bernoulli equation and energy balance, Macroscopic friction factors, dimensional analysis and similitude, flow through pipeline systems, flow meters, pumps and compressors, elementary boundary layer theory, flow past immersed bodies including packed and fluidized beds, Turbulent flow: fluctuating velocity, universal velocity profile and pressure drop. Particle size and shape, particle size distribution, size reduction and classification of solid particles; free and hindered settling; centrifuge and cyclones; thickening and classification, filtration, agitation and mixing; conveying of solids. | Available Now |
| CH-43 | **Basic Level Heat Transfer :** Steady and unsteady heat conduction, convection and radiation, thermal boundary layer and heat transfer coefficients, boiling, condensation and evaporation; types of heat exchangers and evaporators and their process calculations. Design of double pipe, shell and tube heat exchangers, and single and multiple effect evaporators. | Available Now |
| CH-44 | **Basic Level Mass Transfer :** Fick's laws, molecular diffusion in fluids, mass transfer coefficients, film, penetration and surface renewal theories; momentum, heat and mass transfer analogies; stage-wise and continuous contacting and stage efficiencies; HTU & NTU concepts; design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption. | Available Now |
| CH-45 | **Basic Level Chemical Reaction Engineering :** Theories of reaction rates; kinetics of homogeneous reactions, interpretation of kinetic data, single and multiple reactions in ideal reactors, non-ideal reactors; residence time distribution, single parameter model; non-isothermal reactors; kinetics of heterogeneous catalytic reactions; diffusion effects in catalysis. | Available Now |
| CH-46 | **Basic Level Instrumentation and Process Control :** Measurement of process variables; sensors, transducers and their dynamics, process modeling and linearization, transfer functions and dynamic responses of various systems, systems with inverse response, process reaction curve, controller modes (P, PI, and PID); control valves; analysis of closed loop systems including stability, frequency response, controller tuning, cascade and feed forward control. | Available Now |
| CH-47 | **Basic Level Plant Design and Economics :** Principles of process economics and cost estimation including depreciation and total annualized cost, cost indices, rate of return, payback period, discounted cash flow, optimization in process design and sizing of chemical engineering equipments such as compressors, heat exchangers, multistage contactors. | Available Now |

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| CH-48 | **Basic Level Chemical Technology :** Inorganic chemical industries (sulfuric acid, phosphoric acid, chlor-alkali industry), fertilizers (Ammonia, Urea, SSP and TSP); natural products industries (Pulp and Paper, Sugar, Oil, and Fats); petroleum refining and petrochemicals; polymerization industries (polyethylene, polypropylene, PVC and polyester synthetic fibers). | Available Now |
| CH-49 | **Basic Level Engineering Mathematics :**<br>**Linear Algebra:** Matrix algebra, systems of linear equations, eigenvalues and eigenvectors.<br>**Calculus:** Functions of single variable, limit, continuity and differentiability, mean value theorems, indeterminate forms; evaluation of definite and improper integrals; double and triple integrals; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima, Fourier series; gradient, divergence and curl, vector identities, directional derivatives, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems.<br>**Differential equations:** First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems; Laplace transforms; solutions of heat, wave and Laplace's equations.<br>**Complex variables:** Analytic functions; Cauchy-Riemann equations; Cauchy's integral theorem and integral formula; Taylor and Laurent series.<br>Probability and Statistics: Definitions of probability, sampling theorems, conditional probability; mean, median, mode and standard deviation; random variables, binomial, Poisson and normal distributions.<br>**Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations; integration by trapezoidal and Simpson's rules; single and multi-step methods for differential equations.<br>**Transform Theory:** Fourier Transform, Laplace Transform, z-Transform. | Available Now |
| CH-50 | **Basic Level General Aptitude :** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction, Numerical computation, numerical estimation, numerical reasoning and data interpretation. | Available Now |
| CH-51 | **Advanced Level Fluid Mechanics & Mechanical Operation, Chemical Reaction Engineering :** Fluid statics, Newtonian and non-Newtonian fluids, shell-balances including differential form of Bernoulli equation and energy balance, Macroscopic friction factors, dimensional analysis and similitude, flow through pipeline systems, flow meters, pumps and compressors, elementary boundary layer theory, flow past immersed bodies including packed and fluidized beds, Turbulent flow: fluctuating velocity, universal velocity profile and pressure drop.<br>Particle size and shape, particle size distribution, size reduction and classification of solid particles; free and hindered settling; centrifuge and cyclones; thickening and classification, filtration, agitation and mixing; conveying of solids.<br>Theories of reaction rates; kinetics of homogeneous reactions, interpretation of kinetic data, single and multiple reactions in ideal reactors, non-ideal reactors; residence time distribution, single parameter model; non-isothermal reactors; kinetics of heterogeneous catalytic reactions; diffusion effects in catalysis. | Available Now |
| CH-52 | **Advanced Level Heat Transfer & Mass Transfer :** Steady and unsteady heat conduction, convection and radiation, thermal boundary layer and heat transfer coefficients, boiling, condensation and evaporation; types of heat exchangers and evaporators and their process calculations. Design of double pipe, shell and tube heat exchangers, and single and multiple effect evaporators. | Available Now |

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| | Fick's laws, molecular diffusion in fluids, mass transfer coefficients, film, penetration and surface renewal theories; momentum, heat and mass transfer analogies; stage-wise and continuous contacting and stage efficiencies; HTU & NTU concepts; design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption. | |
| CH-53 | **Advanced Level Process Calculations & TD, PDE :** Steady and unsteady state mass and energy balances including multiphase, multi-component, reacting and non -reacting systems. Use of tie components; recycle, bypass and purge calculations; Gibb's phase rule and degree of freedom analysis.<br>First and Second laws of thermodynamics. Applications of first law to close and open systems. Second law and Entropy. Thermodynamic properties of pure substances: Equation of State and residual properties, properties of mixtures: partial molar properties, fugacity, excess properties and activity coefficients; phase equilibria: predicting VLE of systems; chemical reaction equilibrium.<br>Principles of process economics and cost estimation including depreciation and total annualized cost, cost indices, rate of return, payback period, discounted cash flow, optimization in process design and sizing of chemical engineering equipments such as compressors, heat exchangers, multistage contactors. | Available Now |
| CH-54 | **Advanced Level Instrumentation and Process Control & CT:**<br>Measurement of process variables; sensors, transducers and their dynamics, process modeling and linearization, transfer functions and dynamic responses of various systems, systems with inverse response, process reaction curve, controller modes (P, PI, and PID); control valves; analysis of closed loop systems including stability, frequency response, controller tuning, cascade and feed forward control.<br>Inorganic chemical industries (sulfuric acid, phosphoric acid, chlor-alkali industry), fertilizers (Ammonia, Urea, SSP and TSP); natural products industries (Pulp and Paper, Sugar, Oil, and Fats); petroleum refining and petrochemicals; polymerization industries (polyethylene, polypropylene, PVC and polyester synthetic fibers). | Available Now |
| CH-55 | **Advanced Level Engineering Mathematics :**<br>**Linear Algebra:** Matrix algebra, systems of linear equations, eigenvalues and eigenvectors.<br>**Calculus:** Functions of single variable, limit, continuity and differentiability, mean value theorems, indeterminate forms; evaluation of definite and improper integrals; double and triple integrals; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima, Fourier series; gradient, divergence and curl, vector identities, directional derivatives, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems.<br>**Differential equations:** First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems; Laplace transforms; solutions of heat, wave and Laplace's equations.<br>**Complex variables:** Analytic functions; Cauchy-Riemann equations; Cauchy's integral theorem and integral formula; Taylor and Laurent series.<br>Probability and Statistics: Definitions of probability, sampling theorems, conditional probability; mean, median, mode and standard deviation; random variables, binomial, Poisson and normal distributions.<br>**Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations; integration by trapezoidal and Simpson's rules; single and multi-step methods for differential equations.<br>**Transform Theory:** Fourier Transform, Laplace Transform, z-Transform. | Available Now |

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| CH-56 | **Advanced Level General Aptitude :** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction, Numerical computation, numerical estimation, numerical reasoning and data interpretation. | Available Now |
| CH-57 | **Process Calculations & Thermodynamics, FM & MO :**<br>Steady and unsteady state mass and energy balances including multiphase, multi-component, reacting and non -reacting systems. Use of tie components; recycle, bypass and purge calculations; Gibb's phase rule and degree of freedom analysis.<br>First and Second laws of thermodynamics. Applications of first law to close and open systems. Second law and Entropy. Thermodynamic properties of pure substances: Equation of State and residual properties, properties of mixtures: partial molar properties, fugacity, excess properties and activity coefficients; phase equilibria: predicting VLE of systems; chemical reaction equilibrium.<br>Fluid statics, Newtonian and non-Newtonian fluids, shell-balances including differential form of Bernoulli equation and energy balance, Macroscopic friction factors, dimensional analysis and similitude, flow through pipeline systems, flow meters, pumps and compressors, elementary boundary layer theory, flow past immersed bodies including packed and fluidized beds, Turbulent flow: fluctuating velocity, universal velocity profile and pressure drop.<br>Particle size and shape, particle size distribution, size reduction and classification of solid particles; free and hindered settling; centrifuge and cyclones; thickening and classification, filtration, agitation and mixing; conveying of solids. | Available Now |
| CH-58 | **Heat Transfer & Mass Transfer :** Steady and unsteady heat conduction, convection and radiation, thermal boundary layer and heat transfer coefficients, boiling, condensation and evaporation; types of heat exchangers and evaporators and their process calculations. Design of double pipe, shell and tube heat exchangers, and single and multiple effect evaporators.<br>Fick's laws, molecular diffusion in fluids, mass transfer coefficients, film, penetration and surface renewal theories; momentum, heat and mass transfer analogies; stage-wise and continuous contacting and stage efficiencies; HTU & NTU concepts; design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption. | Available Now |
| CH-59 | **Chemical Reaction Engineering & Chemical Technology :** Theories of reaction rates; kinetics of homogeneous reactions, interpretation of kinetic data, single and multiple reactions in ideal reactors, non-ideal reactors; residence time distribution, single parameter model; non-isothermal reactors; kinetics of heterogeneous catalytic reactions; diffusion effects in catalysis.<br>Inorganic chemical industries (sulfuric acid, phosphoric acid, chlor-alkali industry), fertilizers (Ammonia, Urea, SSP and TSP); natural products industries (Pulp and Paper, Sugar, Oil, and Fats); petroleum refining and petrochemicals; polymerization industries (polyethylene, polypropylene, PVC and polyester synthetic fibers). | Available Now |
| CH-60 | **Instrumentation and Process Control & PDE :**<br>Measurement of process variables; sensors, transducers and their dynamics, process modeling and linearization, transfer functions and dynamic responses of various systems, systems with inverse response, process reaction curve, controller modes (P, PI, and PID); control valves; analysis of closed loop systems including stability, frequency response, controller tuning, cascade and feed forward control.<br>Principles of process economics and cost estimation including depreciation and total annualized cost, cost indices, rate of return, payback period, discounted cash flow, optimization in process design and sizing of chemical engineering equipments such as compressors, heat exchangers, multistage contactors. | Available Now |

| TEST NO | TEST NAME : SYLLABUS | DATE OF ACTIVATION |
|---|---|---|
| CH-61 | **Engineering Mathematics :**<br>**Linear Algebra:** Matrix algebra, systems of linear equations, eigenvalues and eigenvectors.<br>**Calculus:** Functions of single variable, limit, continuity and differentiability, mean value theorems, indeterminate forms; evaluation of definite and improper integrals; double and triple integrals; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima, Fourier series; gradient, divergence and curl, vector identities, directional derivatives, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems.<br>**Differential equations:** First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems; Laplace transforms; solutions of heat, wave and Laplace's equations.<br>**Complex variables:** Analytic functions; Cauchy-Riemann equations; Cauchy's integral theorem and integral formula; Taylor and Laurent series.<br>Probability and Statistics: Definitions of probability, sampling theorems, conditional probability; mean, median, mode and standard deviation; random variables, binomial, Poisson and normal distributions.<br>**Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations; integration by trapezoidal and Simpson's rules; single and multi-step methods for differential equations.<br>**Transform Theory:** Fourier Transform, Laplace Transform, z-Transform. | Available Now |
| CH-62 | **General Aptitude :** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction, Numerical computation, numerical estimation, numerical reasoning and data interpretation. | Available Now |

# MOCK TESTS

- Each test carries 100 marks and 3 hours duration

| TEST NO | TEST NAME | DATE OF ACTIVATION |
|---|---|---|
| CH-63 | Full Syllabus Test - 1 (Basic Level) | Available Now |
| CH-64 | Full Syllabus Test - 2 (Basic Level) | Available Now |
| CH-65 | Full Syllabus Test - 3 (Basic Level) | Available Now |
| CH-66 | Full Syllabus Test - 1 (Advance Level) | Available Now |
| CH-67 | Full Syllabus Test - 2 (Advance Level) | Available Now |
| CH-68 | Full Syllabus Test - 3 (Advance Level) | Available Now |
| CH-69 | GATE MOCK TEST - 1 | Available Now |
| CH-70 | GATE MOCK TEST - 2 | Available Now |
| CH-71 | GATE MOCK TEST - 3 | Available Now |
| CH-72 | GATE MOCK TEST - 4 | Available Now |
| CH-73 | GATE MOCK TEST - 5 | Available Now |
| CH-74 | GATE MOCK TEST - 6 | Available Now |

## MSQ TYPE TESTS (Topic Wise)

- Each test carries 25 marks and 45Minutes duration

| TEST NO | TEST NAME | DATE OF ACTIVATION |
|---|---|---|
| CH-75 | Fluid Mechanics | Available Now |
| CH-76 | Mechanical Operations | Available Now |
| CH-77 | Chemical Technology | Available Now |
| CH-78 | Process Control | Available Now |

## MSQ TYPE TESTS (Subject Wise)

- Each test carries 40 marks and 60 Minutes duration

| TEST NO | TEST NAME | DATE OF ACTIVATION |
|---|---|---|
| CH-79 | Heat Transfer | Available Now |
| CH-80 | Process Calculation | Available Now |
| CH-81 | Thermodynamics | Available Now |
| CH-82 | Mass Transfer | Available Now |
| CH-83 | Chemical Reaction Engineering | Available Now |
| CH-84 | General Aptitude | Available Now |