Railway Recruitment Boards
Junior Engineer-2025
CBT-II
Online Test Series

Mechanical and AlliedEngineering - Schedule

No.of Tests : 20	
Subject wise Tests	**16**
Full Length Mock Tests	**4**

Note:

★ The syllabus is considered as per the notifications of the RRB. ACE Engineering Academy does not take responsibility for any changes or deviations in the final RRB-JE-2025 CBT-II examination syllabus. As per the RRB-JE-2025 notification, each question carries '1' mark, and there is negative marking of 1/3rd (i.e., 0.33 marks) for each wrong answer.

★ The test dates may change depending on the RRB-JE-2025 CBT-II examination schedule.

★ Tests will be activated at 6:00 PM on the scheduled day.

★ All tests will remain active until the RRB-JE-2025 CBT-II examination.

★ The test series is available only in English medium.

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Subject-wise Tests

(No.of Questions: 40, Time duration: 32 Minutes and Max Marks: 40 M)

Test No	Name of the Test	Date of Activation
Test-01	General Awareness	01-04-2026
Test-02	Engineering Mechanics	02-04-2026
Test-03	Material Science + Metrology	04-04-2026
Test-04	Physics & Chemistry	05-04-2026
Test-05	Strength of Materials	07-04-2026
Test-06	Heat transfer + Thermodynamics	08-04-2026
Test-07	Basics of Computers and Applications	10-04-2026
Test-08	Machining	11-04-2026
Test-09	Welding	13-04-2026
Test-10	Basics of Environment and Pollution Control	14-04-2026
Test-11	Fluid Mechanics & Hydraulic Machinery	16-04-2026
Test-12	Grinding & Finishing Process	17-04-2026
Test-13	General Awareness + Basics of Environment and Pollution Control	19-04-2026
Test-14	Industrial Management	20-04-2026
Test-15	Thermodynamics-Applications	22-04-2026
Test-16	Physics & Chemistry + Basics of Computers and Applications	23-04-2026

Full Length Mock Test Series

(No.of Questions: 150, Time duration: 120 Minutes and Max Marks: 150)

Test-17	Full Length Mock Test-01	30-04-2026
Test-18	Full Length Mock Test-02	04-05-2026
Test-19	Full Length Mock Test-03	08-05-2026
Test-20	Full Length Mock Test-04	12-05-2026

Syllabus for CBT-II
Mechanical and Allied Engineering

The section wise Number of questions and marks are as below:

Subjects	STAGE-II (CBT-II)	
	No. of Questions	Marks for each Section
General Awareness	15	15
Physics & Chemistry	15	15
Basics of Computers and Applications	10	10
Basics of Environment and Pollution Control	10	10
Technical Abilities	100	100
Total	150	150
Time in Minutes	120	

*** The section wise distribution given in the above table is only indicative and there may be some variationsin the actual question papers.**

General Awareness	Knowledge of Current affairs, Indian geography, culture and history of India including freedom struggle, Indian Polity and Constitution, Indian Economy, Environmental issues concerning India and the World, Sports, General Scientific and Technological Developments etc.
Physics and Chemistry	Up to 10th standard CBSE syllabus.
Basics of Computers and Applications	Architecture of Computers; input and Output devices; Storage devices, Networking, Operating System like Windows, Unix, Linux; MS Office; Various data representation; Internet and Email; Websites & Web Browsers; Computer Virus
Basics of Environment and Pollution Control	Basics of Environment; Adverse effect of environmental pollution and control strategies; Air, water and Noise pollution, their effect and control; Waste Management, Global warming; Acid rain; Ozone depletion.

Technical Abilities

Engineering Mechanics	Resolution of forces, Equilibrium and Equilibrant, parallelogram law of forces, triangle law of forces, polygon law of forces and Lami's theorem, couple and moment of a couple, condition for equilibrium of rigid body subjected to number of coplanar non-concurrent forces, definition of static friction, dynamic friction, derivation of limiting angle of friction and angle of repose, resolution of forces considering friction when a body moves on horizontal plane and inclined plane, calculation of moment of inertia and radius of gyration of : (a) I-Section (b) channel section (c) T-Section (d) L-Section (Equal & unequal lengths) (e) Z-Section (f) Built up sections (simple cases only), Newton's laws of motion (without derivation), motion of projectile, D'Alembert's principle, definition law of conservation of energy, law of conservation of momentum.
Material Science	Mechanical properties of engineering materials – tensile strength, compressive strength, ductility, malleability, hardness, toughness, brittleness, impact strength, fatigue, creep resistance. Classification of steels, mild steel and alloy steels. Importance of heat treatment. Heat treatment processes – annealing, normalizing, hardening, tempering, carburizing, nitriding and cyaniding.
Metrology	Linear measurement – Slip gauges and dial indicators, angle measurements, bevel protractor, sine bar, angle slip gauges, comparators (a) mechanical (b) electrical (c) optical (d) pneumatic. Measurement of surface roughness; methods of measurements by comparison, tracer instruments and by interferometry, collimators, measuring microscope, interferometer, inspection of machine parts using the concepts of shadow projection and profile projection.
Strength of Materials	Stress, strain, stress strain diagram, factor of safety, thermal stresses, strain energy, proof resilience and modules of resilience. Shear force and bending moment diagram – cant leaver beam, simply supported beam, continuous beam, fixed beam. Torsion in shafts and springs, thin cylinder shells.
Thermal Engineering	**Heat transfer + Thermodynamics:** Laws of thermo dynamics, conversion of heat into work vice versa , laws of perfect gases, thermo dynamic processes – isochoric, isobaric, isothermal hyperbolic, isentropic, polytrophic and throttling, modes of heat transfer, thermal conductivity, convective heat transfer coefficient, Stefan Boltzman law by radiation and overall heat transfer coefficient.
Machining	Working principle of lathe. Types of lathes – Engine lathe – construction details and specifications. Nomenclature of single point cutting tool, geometry, tool signature, functions of tool angles. General and special operations – (Turning, facing, taper turning thread cutting, knurling, forming, drilling, boring, reaming, key way cutting), cutting fluids, coolants and lubricants. Introduction to shaper, slotter, plainer, broaching, milling and manufacture of gears, heat treatment process applied to gears.
Welding	key way cutting), cutting fluids, coolants and lubricants. Introduction to shaper, slotter, plainer, broaching, milling and manufacture of gears, heat treatment process applied to gears.

Fluid Mechanics & Hydraulic Machinery	Properties of fluid, density, specific weight, specific gravity, viscosity, surface tension, compressibility capillarity, Pascal's law, measurement of pressures, concept of buoyancy. Concept of Reynold's number, pressure, potential and kinetic energy of liquids, total energy, laws of conservation, mass, energy and momentum, velocity of liquids and discharge, Bernoulli's equation and assumptions, venturi meters, pitot-tube, current meters. Working principle & constructional details of centrifugal pump, efficiencies – manometric efficiency, volumetric efficiency, mechanical efficiency and overall efficiency, cavitation and its effect, working principle of jet & submersible pumps with line diagrams.
Grinding & Finishing Process	Principles of metal removal by grinding, abrasives, natural and artificial, bonds and binding processes, vitrified, silicate, shellac rubber, grinding machines, classification: cylindrical, surface, tool & cutter grinding machine, construction details, relative merits, principles of centreless grinding, advantages & limitations of centreless grinding work, holding devices, wheel maintenance, balancing of wheels, coolants used, finishing by grinding, honing, lapping, super finishing, electroplating, basic principles – plating metals, applications, hot dipping, galvanizing tin coating, parkerising, anodizing, metal spraying, wire process, powder process and applications, organic coatings, oil base paint, lacquer base enamels, bituminous paints, rubber base coating.
Industrial Management	Job analysis, motivation, different theories, satisfaction, performance reward systems, production, planning and control, relation with other departments, routing, scheduling, dispatching, PERT and CPM, simple problems. Materials in industry, inventory control model, ABC Analysis, Safety stock, re-order, level, economic ordering quantity, break even analysis, stores layout, stores equipment, stores records, purchasing procedures, purchase records, Bin card, Cardex, Material handling, Manual lifting, hoist, cranes, conveyors, trucks, fork trucks.
Thermal Engineering	**Thermodynamics-Applications:** Air standards cycles – Carnot cycle, Otto cycle, Diesel cycle, construction and working of internal combustion engines, comparison of diesel engine and petrol engine. Systems of internal combustion engine, performance of internal combustion engines. Air compressors their cycles refrigeration cycles, principle of a refrigeration plant.