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Syllabus issued by
Government of India, Ministry of Railways,
Railway Recruitment Boards
Vide Detailed Centralized Employment Notice
CEN No. 03 / 2024

For Recruitment of Junior Engineer (JE), Depot Material Superintendent (DMS) and
Chemical & Metallurgical Assistant (CMA), Chemical Supervisor (Research) and
Metallurgical Supervisor (Research)

1st Stage CBT (Common for all notified posts of this CEN)

Duration : 90 minutes (120 Minutes for eligible PwBD candidates accompanied with Scribe)

No. of Questions : 100

a. Mathematics :

Number systems, BODMAS, Decimals, Fractions, LCM and HCF, Ratio and Proportion, Percentages, Mensuration, Time and Work, Time and Distance, Simple and Compound Interest, Profit and Loss, Algebra, Geometry, Trigonometry, Elementary Statistics, Square Root, Age Calculations, Calendar & Clock, Pipes & Cistern.

b. General Intelligence and Reasoning :

Analogies, Alphabetical and Number Series, Coding and Decoding, Mathematical operations, Relationships, Syllogism, Jumbling, Venn Diagram, Data Interpretation and Sufficiency, Conclusions and Decision Making, Similarities and Differences, Analytical reasoning, Classification, Directions, Statement – Arguments and Assumptions etc.

c. 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.

d. General Science :

Physics, Chemistry and Life Sciences (up to 10th Standard CBSE syllabus).

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

Subjects	No. of Questions	Marks for each Section
	Stage-I	Stage-I
Mathematics	30	30
General Intelligence &	25	25
General Awareness	15	15
General Science	30	30
Total	100	100
Time in Minutes	90	



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**For Recruitment of Junior Engineer (JE), Depot Material Superintendent (DMS) and
Chemical & Metallurgical Assistant (CMA)**

Computer Based Test (CBT – II stage)

RRB JE CBT 2 Exam

Total duration of RRB Junior Engineer CBT Stage 2 is 120 minutes and total number of questions is 150.

Subjects	No. of Questions	Marks
General Awareness	15	15
Physics & Chemistry	15	15
Basics of Computer and its Applications	10	10
Basic of Environment and Pollution Control	10	10
Technical Ability	100	100
Total	150	150
Time in minutes	120	

- Selection of candidates for the 2nd stage CBT exam will be based on the normalized marks obtained by them in 1st stage of CBT exam.
- Virtual calculator will be made available on the Computer Monitor during 2nd stage of CBT exam.
- Negative Marking** : 1/3rd of question mark will be deducted for each wrong answer from total.
- Same Minimum percentage of marks for eligibility in various categories as in 1st stage of CBT.
- There can be variation in the actual question papers. Total number of candidates to be shortlisted for 2nd Stage shall be 15 times the community wise total vacancy of Posts notified against the RRB as per their merit in 1st Stage CBT.

RRB JE 2nd Stage CBT 2024 Syllabus

Here questions will be of objective type with multiple choices (MCQ) and are likely to include questions pertaining to each syllabus sections.

RRRB JE CBT 2nd Stage General Awareness

Current Affairs Knowledge, Culture and history of India including freedom struggle, Indian Polity and Constitution, Indian Geography, Indian Economy, Environment issues concerning India and the world, Sports, General Scientific and technological developments

RRRB JE CBT 2nd Stage Physics and Chemistry

Questions shall be based of upto 10th standard CBSE syllabus.

RRRB JE CBT 2nd Stage Basic 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.

RRRB JE CBT 2nd Stage Basic of Environment and Pollution Control

Basic of Environment, Adverse effect environmental pollution and control strategies; Air, water and Noise pollution, their effect and control; Waste Management, Global warming; Acid rain; Ozone depletion.

RRRB JE CBT 2nd Stage Technical Ability

RRB JE Syllabus for Civil and Allied Engineering

Chapter Name	Topics
Engineering Mechanics	Force (resolution of force, moment of force, force system, composition of forces), Equilibrium, Friction, Centroid and Center of gravity, Simple machines.
Building Construction	Building components (substructure, superstructure), type of structure (load bearing, framed and composite structures).
Building Materials	Masonry materials (stones, bricks, and mortars), Timber and miscellaneous materials (glass, plastic, fiber, aluminum steel, galvanized iron, bitumen, PVC, CPVC, and PPF).
Construction of Substructure	job layout, earthwork, foundation (types, dewatering, coffer dams, bearing capacity).
Construction of Superstructure	Stone masonry, brick masonry, Hollow concrete block masonry, composite masonry, cavity wall, doors and windows, vertical communication (stairs, lifts, escalators), scaffolding and shoring.
Building Finishes	Floors (finishes, process of laying), walls (plastering, pointing, painting) and roofs (roofing materials including RCC).
Building Maintenance	Cracks (causes, type, repairs- grouting, guniting, epoxy etc.), settlement (causes and remedial measures), and re- barring techniques.
Building Drawing	Conventions (type of lines, symbols), planning of building (principles of planning for residential and public buildings, rules and byelaws), drawings (plan, elevation, section, site plan, location plan, foundation plan, working drawing), perspective drawing.
Concrete Technology	Properties of various types/grades of cement, properties of coarse and fine aggregates, properties of concrete (water cement ratio, properties of fresh and hardened concrete), Concrete mix design, testing of concrete, quality control of concrete (batching, formwork, transportation, placing, compaction, curing, waterproofing), extreme weather concreting and chemical admixtures, properties of special concrete (ready mix, RCC, pre-stressed, fiber reinforced, precast, high performance).
Surveying	Types of survey, chain and cross staff survey (principle, ranging, triangulation, chaining, errors, finding area), compass survey (principle, bearing of line, prismatic compass, traversing, local attraction, calculation of bearings, angles and local attraction) leveling (dumpy level, recording in level book, temporary adjustment, methods of reduction of levels, classification of leveling, tilting level, auto level, sources of errors, precautions and difficulties in leveling), contouring (contour interval, characteristics, method of locating, interpolation, establishing grade contours, uses of contour maps), area and volume measurements, plane table survey (principles, setting, method), theodolite survey (components, adjustments, measurements, traversing), Tacheometric survey, curves (types, setting out), advanced survey equipment, aerial survey and remote sensing.
Computer Aided Design	CAD Software (AutoCAD, Auto Civil, 3D Max etc.), CAD commands, generation of plan, elevation, section, site plan, area statement, 3D view.

Geo Technical Engineering	Application of Geo Technical Engineering in design of foundation, pavement, earth retaining structures, earthen dams etc., physical properties of soil, permeability of soil and seepage analysis, shear strength of soil, bearing capacity of soil, compaction and stabilization of soil, site investigation and sub soil exploration.
Hydraulics	Properties of fluid, hydrostatic pressure, measurement of liquid pressure in pipes, fundamentals of fluid flow, flow of liquid through pipes, flow through open channel, flow measuring devices, hydraulic machines.
Irrigation Engineering	Hydrology, investigation and reservoir planning, percolation tanks, diversion head works.
Mechanics of Structures	Stress and strain, shear force and bending moment, moment of inertia, stresses in beams, analysis of trusses, strain energy.
Theory of Structures	Direct and bending stresses, slope and deflection, fixed beam, continuous beam, moment distribution method, columns.
Design of Concrete Structures	Working Stress method, Limit State method, analysis and design of singly reinforced and doubly reinforced sections, shear, bond and development length, analysis and design of T Beam, slab, axially loaded column and footings.
Design of Steel Structures	Types of sections, grades of steel, strength characteristics, IS Code, Connections, Design of tension and compression members, steel roof truss, beams, column bases.
Transportation Engineering	Railway Engineering (alignment and gauges, permanent way, railway track geometrics, branching of tracks, stations and yards, track maintenance), Bridge engineering (site selection, investigation, component parts of bridge, permanent and temporary bridges, inspection and maintenance), Tunnel engineering (classification, shape and sizes, tunnel investigation and surveying, method of tunneling in various strata, precautions, equipment, explosives, lining and ventilation).
Highway Engineering	Road Engineering, investigation for road project, geometric design of highways, construction of road pavements and materials, traffic engineering, hill roads, drainage of roads, maintenance and repair of roads.
Environmental Engineering	Environmental pollution and control, public water supply, domestic sewage, solid waste management, environmental sanitation, and plumbing.
Advanced Construction techniques and Equipment	Fibers and plastics, artificial timber, advanced concreting methods (under water concreting, ready mix concrete, tremix concreting, special concretes), formwork, pre- fabricated construction, soil reinforcing techniques, hoisting and conveying equipment, earth moving machinery (exaction and compaction equipment), concrete mixers, stone crushers, pile driving equipment, working of hot mix bitumen plant, bitumen paver, floor polishing machines.
Estimating and Costing	Types of estimates (approximate, detailed), mode of measurements and rate analysis.
Contracts and Accounts	Types of engineering contracts, Tender and tender documents, payment, specifications.