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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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CEN No. 03 / 2024

**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

→ 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

Exam paper has been framed into 7 group based on the technical ability.

1. Civil & Allied Engineering-JE
2. Electrical & Allied Engineering-JE
3. Electronic & Allied Engineering-JE
4. Mechanical & Allied Engineering-JE
5. Computer Science and Information Technology – JE
6. Printing Technology – JE
7. Chemical & Metallurgical Assistant (CMA)

RRB JE Syllabus for Electrical and Allied Engineering

Chapter Name	Topics
Basic concepts	Concepts of resistance, inductance, capacitance, and various factors affecting them. Concepts of current, voltage, power, energy and their units.
Circuit law	Kirchhoff's law, Simple Circuit solution using network theorems.
Magnetic Circuit	Concepts of flux, mmf, reluctance, Different kinds of magnetic materials, Magnetic calculations for conductors of different configuration e.g. straight, circular, solenoidal, etc. Electromagnetic induction, self and mutual induction.
AC Fundamentals	Instantaneous, peak, R.M.S. and average values of alternating waves, Representation of sinusoidal wave form, simple series and parallel AC Circuits consisting of R.L. and C, Resonance, Tank Circuit. Poly Phase system – star and delta connection, 3 phase power, DC and sinusoidal response of R-Land R-C circuit.
Measurement and measuring instruments	Measurement of power (1 phase and 3 phase, both active and re-active) and energy, 2 wattmeter method of 3 phase power measurement. Measurement of frequency and phase angle. Ammeter and voltmeter (both moving oil and moving iron type), extension of range wattmeter, Multimeters, Megger, Energy meter AC Bridges. Use of CRO, Signal Generator, CT, PT and their uses. Earth Fault detection.
Electrical Machines	(a) D.C. Machine – Construction, Basic Principles of D.C. motors and generators, their characteristics, speed control and starting of D.C. Motors. Method of braking motor, Losses and efficiency of D.C. Machines. (b) 1 phase and 3 phase transformers – Construction, Principles of operation, equivalent circuit, voltage regulation, O.C. and S.C. Tests, Losses and efficiency. Effect of voltage, frequency and wave form on losses. Parallel operation of 1 phase / 3-phase transformers. Auto transformers. (c) 3 phase induction motors, rotating magnetic field, principle of operation, equivalent circuit, torque-speed characteristics, Starting and speed control of 3 phase induction motors. Methods of braking, effect of voltage and frequency variation on torque speed characteristics, Fractional Kilowatt Motors and Single Phase Induction Motors: Characteristics and applications.
Synchronous Machines	Generation of 3-phase e.m.f. armature reaction, voltage regulation, parallel operation of two alternators, synchronizing, control of active and reactive power. Starting and applications of synchronous motors.
Generation, Transmission and Distribution	Different types of power stations, Load factor, diversity factor, demand factor, cost of generation, inter-connection of power stations. Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults.
Switchgears and Protection	Rating of circuit breakers, Principles of arc extinction by oil and air, H.R.C. Fuses, Protection against earth leakage / over current, etc. Buchholz relay, Merz-Price system of protection of generators & transformers, protection of feeders and bus bars. Lightning arresters, various transmission and distribution system, comparison of conductor materials, efficiency of different system. Cable– Different type of cables, cable rating and derating factor.
Estimation and costing	Estimation of lighting scheme, electric installation of machines and relevant IE rules. Earthing practices and IE Rules.
Utilization of Electrical Energy	Illumination, Electric heating, Electric welding, Electroplating, Electric drives and motors.
Basic Electronics	Working of various electronic devices e.g. PN Junction diodes, Transistors (NPN and PNP type), BJT and JFET. Simple circuits using these devices.