RRB

Railway Recruitment Board

Junior Engineer

Recruitment Examination

CBT-I & CBT-II

Civil Engineering

Includes

Practice Papers &
Solved Papers 2019 (4 Sets)
(CBT-I & CBT-II)

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Contents

CBT – I

MATHEMATICS

1.	Number System	1.1 - 1.9
2.	Percentage and Ratio & Proportion	2.1 - 2.16
3.	Problems On Age	3.1 - 3.4
4.	Alligations & Mixtures	4.1 - 4.5
5.	Time and Work	5.1 - 5.11
6.	Time and Distance	6.1 - 6.10
7.	Boats and Streams	7.1 - 7.3
8.	Simple Interest and Compound Interest	8.1 - 8.10
9.	Profit, Loss and Discount	9.1 - 9.9
10.	Average	10.1 - 10.12
11.	Algebra	11.1 - 11.10
12.	Trigonometric Ratios and Height & Distance	12.1 - 12.13
13.	Clock and Calendars	13.1 - 13.10
14.	Geometry	14.1 - 14.18
15.	Mensuration	15.1 - 15.12

GENERAL INTELLIGENCE & REASONING

1.	Alphabetical and Number Series	1.1 - 1.7
2.	Analogy	2.1 - 2.10
3.	Odd One Out	3.1 - 3.4
4.	Coding Decoding	4.1 - 4.10
5.	Blood Relations	5.1 - 5.7
6.	Direction Sense Test	6.1 - 6.4
7.	Venn Diagrams	7.1 - 7.7
8.	Syllogism	8.1 - 8.10
9.	Statement Conclusion	9.1 - 9.7
10.	Statement Assumption	10.1 - 10.6
11.	Mathematical Puzzles	11.1 - 11.6
12.	Cubes and Dice	12.1 - 12.4
13.	Analytical Reasoning	13.1 - 13.6
14.	Data Sufficiency	14.1 - 14.9

GENERAL SCIENCE*

1. Physics 1.1 - 1.32
2. Chemistry 2.1 - 2.22
3. Biology 3.1 - 3.43

GENERAL AWARENESS*

1. Indian History 1.1 – 1.36
2. India Geography 2.1 – 2.29
3. Constitution of India 3.1 – 3.19
4. Basics of economics and indian economy since independence 4.1 – 4.19
5. current affairs 5.1 – 5.27
- Practice Exercise 1 - 10

CBT – II

BASICS OF ENVIRONMENT AND POLLUTION CONTROL

- Basics of Environment and Pollution Control 1 - 16

BASICS OF COMPUTERS AND APPLICATIONS

- Basics of Computers and Applications 1 - 15

CIVIL

1. Engineering Mechanics 1.1 - 1.17
2. Theory of Structures 2.1 - 2.30
3. Design of Steel Structures 3.1 - 3.41
4. Concrete Technology 4.1 - 4.16
5. Design of Concrete Structures 5.1 - 5.25
6. Building Materials 6.1 - 6.51
7. Geo-technical Engineering 7.1 - 7.32
8. Hydraulics 8.1 - 8.32
9. Irrigation Engineering 9.1 - 9.30
10. Surveying 10.1 - 10.34
11. Environmental Engineering 11.1 - 11.53

PRACTICE PAPERS

- CBT-I 1 - 12
- CBT-II 1 - 11

SOLVED PAPERS 2019

- Solved Paper (22 May, 2019) CBT-I 1 - 16
- Solved Paper (23 May, 2019) CBT-I 1 - 17
- Solved Paper (28 August 2019) CBT-II Set 1 1 - 21
- Solved Paper (28 August 2019) CBT-II Set 2 1 - 22

* *Common for CBT-I and CBT-II*

Syllabus

RECRUITMENT PROCESS

Only single online application ***{common to all the notified posts in opted RRB*** - **Junior Engineer (JE), Junior Engineer (Information Technology) [JE(IT)], Depot Material Superintendant (DMS) and Chemical & Metallurgical Assistant (CMA)}** *has to be submitted by the candidate through the link provided on the official website of RRBs.*

The entire recruitment process shall involve, 1st stage Computer Based Test (CBT), 2nd stage CBT, and Document Verification / Medical Examination as applicable. Selection is made strictly as per merit, on the basis of CBTs.

The date, time and venue for all the activities viz CBTs and DV or any other additional activity as applicable shall be fixed by the RRB and shall be intimated to the eligible candidates in due course. Request for postponement of any of the above activity or for change of venue, date and shift will not be entertained under any circumstances.

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

The *1st stage* CBT is of screening nature and the standard of questions for the CBT will be generally in conformity with the educational standards and/or minimum technical qualifications prescribed for the posts. The normalized score of *1st* stage exam shall be used only for short listing of candidates for *2nd* stage exam as per their merit. Candidates who are shortlisted for 2nd *stage* CBT availing the reservation benefits of a community, PwBD and ExSM shall continue to be considered only against that community for all subsequent stages of recruitment process.

The Questions will be of objective type with multiple choices and are likely to include questions pertaining to:

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 Stage-I	Marks for each Section Stage-I
Mathematics	30	30
General Intelligence & Reasoning	25	25
General Awareness	15	15
General Science	30	30
Total	100	100
Time in Minutes	90	

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

Minimum percentage of marks for eligibility in various categories: UR -40%, OBC-30%, SC-30%, ST -25%. These percentage of marks for eligibility may be relaxed by 2% for PwBD candidates in case of shortage of PwBD candidates against vacancies reserved for them.

2nd Stage CBT

Short listing of Candidates for the 2nd Stage CBT exam shall be based on the normalized marks obtained by them in the 1st Stage CBT Exam. 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. However, Railways reserve the right to increase/decrease this limit in total or for any specific category(s) as required to ensure availability of adequate candidates for all the notified posts.

Duration : 120 minutes *(160 Minutes for eligible PwBD candidates accompanied with Scribe)*

No of Questions : 150

Syllabus

The Questions will be of objective type with multiple choices and are likely to include questions pertaining to General Awareness, Physics and Chemistry, Basics of Computers and Applications, Basics of Environment and Pollution Control and Technical abilities for the post. The syllabus for General Awareness, Physics and Chemistry, Basics of Computers and Applications, Basics of Environment and Pollution Control is common for all notified posts under this CEN as detailed below:-

a) 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.

b) Physics and Chemistry

Up to 10th standard CBSE syllabus.

c) 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.

d) 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.

e) Technical Abilities:

The educational qualifications mentioned against each post shown in Annexure-A, have been grouped into

different exam groups as below. Questions on the Technical abilities will be framed in the syllabus defined for various Exam Groups

given at Annexure-VII-A, B, C, D, E, F & G.

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

Subjects	**No. of Questions Stage-II**	**Marks for each Section Stage-II**
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 variations in the actual question papers.

Minimum percentage of marks for eligibility in various categories: UR -40%, OBC-30%, SC-30%, ST -25%. This percentage of marks for eligibility may be relaxed by 2% for PwBD candidates, in case of shortage of PwBD candidates against vacancies reserved for them.

Virtual calculator will be made available on the Computer Monitor during 2nd Stage CBT.

Discipline Mapping Tables:-

(I)

Sl. No.	**Three years Diploma in Engineering or Bachelor's Degree in Engineering/Technology**	**Exam Group**
1.	Mechanical Engineering Production Engineering Automobile Engineering Manufacturing Engineering Mechatronics Engineering Industrial Engineering Machining Engineering Tools and Machining Engineering Tools and Die Making Engineering Combination of any sub stream of basic streams of above disciplines	Mechanical and Allied Engineering
2.	Electrical Engineering Combination of any sub stream of basic streams of Electrical Engineering	Electrical and Allied Engineering
3.	Electronics Engineering Instrumentation and Control Engineering	

	Communication Engineering Computer Science and Engineering Computer Engineering Computer Science Information Technology Combination of sub streams of basic streams of above disciplines.	Electronics and Allied Engineering
4.	Civil Engineering Combination of any sub stream of basic streams of Civil Engineering B.Sc., in Civil Engineering of 3years duration	Civil and Allied Engineering
5.	Printing Technology/Engineering	Printing Technology

(II)

Sl. No.	**Educational Qualifications**	**Exam Group**
1.	B.Sc., Chemistry and Physics	CMA

(III)

Sl. No.	**Educational Qualifications**	**Exam Group**
1.	BE/B.Tech., (Computer Science) BE/B.Tech., (Information Technology) PGDCA B.Sc. Computer Science BCA DOEACC "B" Level Course of 3 years duration or equivalent	Computer Science and Information Technology

All the candidates with the above qualification shall be tested in the Exam Group mapped as per the above chart. However, candidates with educational qualification of BE/B.Tech (Computer Science) or BE/B.Tech (Information Technology), applying for both the posts of JE(S&T Department) and JE (IT), have to opt for either Electronics and Allied Engineering Exam Group or Computer Science and Information Technology Exam Group. The educational qualification for the post of DMS (Depot Material Superintendent) is Three Years Diploma in Engineering i.e a candidate with Three Years Diploma in any of Engineering disciplines, can apply for these posts as applicable. Candidates with educational qualifications not figuring in the above chart and eligible for DMS posts have to choose any one of the above listed Exam Groups other than CMA Exam Group, during the registration for online applications of this CEN.

A candidate possessing more than one minimum educational qualification, mapped to different Exam Groups, can choose any one Exam Group. These candidates would be eligible for all the posts for which they possess minimum educational qualifications.

SHORTLISTING OF CANDIDATES FOR 2nd STAGE CBT, DV AND EMPANELMENT:

Short listing of Candidates for the DV shall be based on the normalized marks obtained by them in 2nd Stage CBT. The normalization scheme to be adopted for short listing the candidates from 1st Stage CBT to 2nd Stage CBT and for DV on the basis of performance in 2nd Stage CBT is detailed below:

NORMALISATION OF THE MARKS:

Whenever CBT is conducted in multiple sessions for the same syllabus, the raw marks obtained by the candidates in different sessions will be converted to normalized marks.

The raw marks for single session paper and normalized marks for multi session paper will be used for computing Merit Index, which is a common benchmark for generating merit for candidates from different Exam Groups.

CALCULATION OF NORMALIZED MARKS FOR MULTI-SESSION PAPERS:

In 1st Stage CBT and for some Exam Groups in 2nd Stage CBT, the examination may be conducted in multi-sessions. Hence, for these multisession papers, a suitable normalization is applied to take into account any variation in the difficulty levels of the question papers across different sessions.

The formula for calculating the normalized marks for the multi-session papers is detailed below:

Normalization mark of j^{th} candidate in i^{th} session $\hat{M}_{ij}$ is given by :

$$\hat{M}_{ij} = \frac{\bar{M}_t^g - M_q^g}{M_{ti} - M_{iq}}\left(M_{ij} - M_{iq}\right) + M_q^g$$

M_{ij} : is the actual marks obtained by the j^{th} candidate in i^{th} session.

$\bar{M}_t^g$: is the average marks of the top 0.1% of the candidates considering all sessions.

M_q^g : is the sum of mean and standard deviation marks of the candidates in the paper considering all sessions.

$\bar{M}_{ti}$: is the average marks of the top 0.1% of the candidates in the i^{th} session or marks of topper if session strength is less than 1000.

M_{iq} : is the sum of the mean marks and standard deviation of the i^{th} session.

CALCULATION OF MERIT INDEX FOR ALL PAPERS :

In order to generate a common merit list comprising of candidates who gave examination from different Exam Groups, but eligible for a common post, merit index will be computed. For all papers for which there is only one session, actual marks obtained by the candidates will be used for calculating Merit Index, while for papers in multi-sessions, normalized marks will be calculated corresponding to the raw marks obtained by a candidate and the Merit Index will be calculated based on the normalized marks.

The Merit Index will be computed using the formula given below :

$$\text{Merit Index} = S_q + (S_t - S_q)\frac{M - M_q}{\bar{M}_t - M_q}$$

(Merit Index is the relative score of a candidate within the discipline.)

M: Marks obtained by the candidate (actual/raw marks for single session exam and normalized marks for multi session exam.

M_q: The qualifying marks for general category candidate in the paper (40).

$\bar{M}_t$: The mean marks of top 0.1% or top 10 whichever is larger of the candidates who appeared in the paper (in case of multi session exam including all sessions)

Sq: 350 is the score assigned to M_q.

St: 900 is the score assigned to $\bar{M}_t$.

The qualifying marks (M_q) for general category candidate is 40.

The Merit Index will be calculated for UR, OBC, SC, ST candidates whose actual marks for single session exam and normalized marks for multi session exam are equal or above the community qualifying marks prescribed in Para 13.2. Based on the Merit Index generated, a combined merit list of the candidates of different disciplines/ Exam Group will be prepared in the descending order of merit and the allotment of the preference will be done on the basis of this merit list.