



NORTHERN RAILWAY
(Personnel Department)

P.S. No. 16017/2025

Headquarters Office,
Baroda House,
New Delhi.

NO. 752-E/Mech Policy/EIIC

DATE: 16/07/2025

Divisional Railway Manager/NR: DLI, FZR, MB, UMB, LKO & JAT
Chief Workshop Manager/NR: AMV-LKO, CB-LKO, JUDW, ASR & RCNK-SNP,
CWM/Signal Shop, GZB.
CAO/C: K. Gate DLI & Satyam Complex, Trikuta Ngr/JAT.
MD/NRCH.
Chief Manager (Ptg. & Sty) Punjabi Bagh, Delhi
Dy.CMM: SSB, AMV-LKO & JUDW.
DY.CE/TMC/Line, State Entry Road, New Delhi.
Dy.CE/Bridge, CB-LKO, JUC & TKJ.

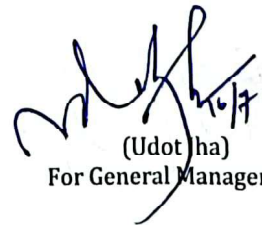
Sub: Syllabus of written examination for the post of Junior Engineer/Dsl/Mech.
Ref: (i) PCPO/NR's letter no. PCPO/Sel./2025 dated 15/05/2025.
(ii) Dy.CME/HQ's letter no. Confdl.Mech/Group C Selection/266 dated 14/07/2025.

In reference to above subject, the syllabus of written examination for the post of Junior Engineer/Dsl/Mech in Level-06, is enclosed herewith for your information and necessary action please.

The above PS.No. is available on the website given as under:-<https://nr.indianrailways.gov.in>

Please acknowledge the receipt

DA: As Above


(Udot ha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. Genl. Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. Genl. Secy./ URMU, 166/2, P.K.Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Genl. Secy./ All India SC/ST Rly Emp. Asso. North Zone Office, Baroda House, New Delhi.
6. Genl. Secy./ NRPOA Room No.301, HQ Office, Baroda House, New Delhi.
7. Dy.CPO/IT, HQs Office, Baroda House, NDLS for uploading on the website.
8. Dy.CPO/R&P, HQs Office, Baroda House, NDLS being policy matter.



**Syllabus for TQ/PQ examination for selection to the post of
Junior Engineer DSL/MECH**

Part 1: General Knowledge

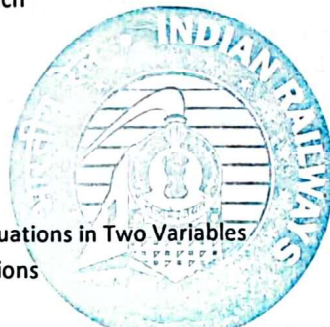
- 1.1 Important National & International Events, Authors, Places & Personalities etc.
- 1.2 Sports
- 1.3 "Who's Who"
- 1.4 Facts about Indian Railways & its Organization, Important events in Indian Railways
- 1.5 Current Affairs

Part-2: English

- 2.1 Antonyms and Synonyms
- 2.2 Idioms & Phrases
- 2.3 Tenses, Modals, Determiners, Prepositions
- 2.4 Active and Passive Voice
- 2.5 Direct and Indirect Speech
- 2.6 Unseen Passages

Part-3: Mathematics

- 3.1 Algebra
 - 3.1.1 Real Numbers
 - 3.1.2 Polynomials
 - 3.1.3 Pair of Linear Equations in Two Variables
 - 3.1.4 Quadratic Equations
- 3.2 Arithmetic
 - 3.2.1 Problems based on age, time, work, money, Profit and Loss, and Interest
- 3.3 Geometry
 - 3.3.1 Lines
 - 3.3.2 Triangles: Pythagoras' Theorem, Midpoint Theorem, Area, Congruence of Triangles, Angle Sum Property, Exterior Angle Property; Similar Figures, Similarity of Triangles
 - 3.3.3 Properties and area of Parallelogram
 - 3.3.4 Circles: Area and Perimeter of Circle, Angle Subtended by a Chord at a point, Perpendicular from the Centre to a Chord, Equal Chords and their distances from the Centre, Angle subtended by an Arc of a Circle, Cyclic Quadrilaterals, Tangent to a Circle, number of Tangents from a point on a Circle, Area of Sector and Segment of a Circle
 - 3.3.5 Surface Areas and Volumes of cuboid, cone, cylinder, and sphere; and Combination of Solids
- 3.4 Coordinate Geometry
 - 3.4.1 Basics of the Cartesian system
 - 3.4.2 Distance Formula



- 3.5 Introduction to Trigonometry
 - 3.5.1 Trigonometric Ratios
 - 3.5.2 Trigonometric Ratios of Specific Angles
 - 3.5.3 Trigonometric Identities
 - 3.5.4 Applications of Trigonometry: Heights and Distances
- 3.6 Statistics
 - 3.6.1 Mean, Mode, Median of Grouped Data
 - 3.6.1 Mean Deviation & Standard Deviation

Part-4: General Science

- 4.1 Matter in Our Surroundings: Physical Nature of Matter, Characteristics of Particles of Matter, States of Matter, Mixture, Solution, Concentration of a Solution, Compound
- 4.2 Atoms, Molecules and Chemical Reactions, Structure of the Atom, Valency, Atomic Number, Mass Number, Isotopes, Isobars, Laws of Chemical Combination, Chemical Equations, Types of Chemical Reactions, Oxidation and Reduction, Acids, Bases and Salts, Name of salts and compounds, Types of Oxides, Properties and Laboratory Preparation of Oxygen, Hydrogen, and Nitrogen
- 4.3 Metals and Non-metals (Physical Properties, Chemical Properties), Ores of Metals, Corrosion and its prevention
- 4.4 Carbon and Its Compounds: Bonding in Carbon, Versatile Nature of Carbon, Chemical Properties of Carbon Compounds, Important Carbon Compounds – Ethanol and Ethanoic Acid, Soaps and Detergents
- 4.5 Force and Laws of Motion: Motion Along a Straight Line, Uniform Motion and Non-Uniform Motion, Speed with Direction, Acceleration, Equations of Motion, Uniform Circular Motion, Balanced and Unbalanced Forces, Laws of Motion, Inertia and Mass
- 4.6 Gravitation: Universal Law of Gravitation, Free Fall, Mass & Weight, Thrust and Pressure, Buoyancy, Archimedes' Principle
- 4.7 Work and Energy: Scientific Conception of Work, Forms of Energy, Potential Energy, Potential Energy of an Object at a Height, Law of Conservation of Energy, Power, Method of Heat Transfer
- 4.8 Sound: Propagation of Sound, Characteristics of a Sound Wave, Reflection of Sound, Echo, Reverberation, Range of Hearing, Applications of Ultrasound
- 4.9 Light: Reflection and Refraction, Spherical Mirrors, Sign Convention for Reflection by Spherical Mirrors, Refractive Index, Refraction through a Rectangular Glass Slab & prism, Atmospheric Refraction, Refraction by Spherical Lenses, Image Formation by Lenses, The Human Eye, Dispersion of White Light by a Glass Prism
- 4.10 Electricity: Electric Current and Circuit, Electric Potential and Potential Difference, Symbols of some commonly used components in circuit diagrams, Ohm's Law, Factors affecting the Resistance, Resistance of a System of Resistors, Heating Effect of Electric Current, Electric Power, Domestic Electric Circuits
- 4.11 Magnetic Effects of Electric Current: Magnetic Field and Field Lines, Magnetic Field due to a Current-Carrying Conductor, Force on a Current-Carrying Conductor in a Magnetic Field

Part-5: Establishment Rules

- 5.1 Pass Rules
- 5.2 Leave Rules
- 5.3 Payment of Wages Act
- 5.4 Hours of Employment Regulations
- 5.5 D&AR (Disciplinary & Appeal Rules)
- 5.6 Workmen's Compensation Act
- 5.7 Factory Act
- 5.8 Basic Knowledge about HRMS, RESS, HIMS, NPS/UPS, and UMID web portals/App

Part-6 Stores

- 6.1 System of receiving and issuing goods from the store, local purchase, and inventory control
- 6.2 Stock and Non-Stock Items, PL Number
- 6.3 Basic Knowledge about UDM, GEM, IMMS, IREPS

Part-7 राजभाषा

- 7.1 संघ की राजभाषा नीति का सामान्य परिचय
- 7.2 राजभाषा अधिनियम 1963
- 7.3 राजभाषा संशोधन नियम 1976
- 7.4 राजभाषा संकल्प 1968
- 7.5 राजभाषा से संबन्धित वार्षिक पाठ्यक्रम एवं प्रचलित शब्दावली

Part-8 Professional Knowledge

8.1 ALCO Locomotive

- 8.1.1 Design and construction of Diesel engine of ALCO Locomotive
- 8.1.2 Tri mounted fabricated bogie and all its components
- 8.1.3 Basic Systems: Fuel oil, Lube oil, Water cooling system and their components
- 8.1.4 Turbo supercharging in ALCO Locomotive
- 8.1.5 Testing: Load box test, self load, Auto test, Dry run test, ETS
- 8.1.6 IRAB brake system, sanding system
- 8.1.7 Basic design and features of CBC and its components
- 8.1.8 Various schedule maintenance: T1, T2, M1, M2, M6, M18, M24, M72

8.2 HHP Locomotive

- 8.2.1 Various types and features and nomenclature of GM locomotives
- 8.2.2 Design and construction of Engine block used in GM Locomotives
- 8.2.3 Basic knowledge of Design, Features and maintenance of HTSC bogie
- 8.2.4 Basic Systems of GM loco: Fuel oil, Lube oil and water cooling system
- 8.2.5 Design and overhauling of Cylinder liner, cylinder head and valve mechanism
- 8.2.6 Design and features of CBC and its components
- 8.2.7 Under gear components and their maintenance in GM Locomotives
- 8.2.8 CCB brake system and its components
- 8.2.9 Various schedules: 30 Days, 90 Days, 180 Days, Yearly 3 yearly and 6 yearly

8.3 Electric Locomotive

- 8.3.1 Design and construction of Electric Locomotive
- 8.3.2 Bogie used in electric locomotive and its components
- 8.3.3 Design, construction and maintenance of Pantograph
- 8.3.4 Design, construction and maintenance of Transformer and its auxiliaries
- 8.3.5 Design, working and maintenance of Tap changer
- 8.3.6 Under gear maintenance of electric locomotive
- 8.3.7 CBC and its components
- 8.3.8 Various maintenance schedules IA, IB, IC and TOH



8.4 T-18 (Vande Bharat)

- 8.4.1 Basic Knowledge of T-18, Formation of T-18
- 8.4.2 Bogie used in T-18 & its components
- 8.4.3 Pantograph System Maintenance
- 8.4.4 Main transformer and Auxiliary Systems
- 8.4.5 Brake Systems and its components
- 8.4.6 Basic idea of equipment fitted in different coaches of Train-18
- 8.4.7 Fire and Smoke Detection System (FSDS), Fire Detection and Suppression System (FDSS), VESDA
- 8.4.8 Wheels and Axles
- 8.4.9 Various schedule checks of Train-18: Trip, Monthly, Quarterly and 9 monthly

8.5 DEMU

- 8.5.1 Configuration of DEMU
- 8.5.2 Bogie used in DEMU
- 8.5.3 Design and construction of diesel engine of Driving Power Car
- 8.5.4 Passenger Amenities & safety items
- 8.5.5 Basic knowledge of various under frame equipment of Driving Power Car
- 8.5.6 Various schedule checks of DPC: A check, B check, C check and D check

8.6 MEMU/EMU

- 8.6.1 Basic idea of configuration and purpose of EMU/MEMU trains
- 8.6.2 Basic knowledge of bogie, coupler and other under frame equipment
- 8.6.3 Passenger Amenities & safety items
- 8.6.4 Basic idea of schedule maintenance IA and IC of EMU/MEMU

8.7 General

- 8.7.1 Types of bolts and nuts: Lock bolts, Hex bolts, Carriage bolts and Eye bolts
- 8.7.2 Common Nut types including hex nuts, lock nuts and wing nuts
- 8.7.3 Different types of Rivets: Snap head and Counter sunk
- 8.7.4 Basic knowledge & advantages of CNC machines and their major applications
- 8.7.5 Industrial safety, Fire safety, Housekeeping and First Aid
- 8.7.6 Knowledge of the Time office, Progress, Procedure for the Gate Pass etc.
- 8.7.7 Basic knowledge of computers (MS Word, MS Excel, MS PowerPoint, working of computers and applications)
- 8.7.8 Procedure of Ferrous and Non-Ferrous scrap disposal
- 8.7.9 Knowledge of hazardous work and its disposal
- 8.7.10 Procedure of condemnation of locomotives
- 8.7.11 Basic knowledge of e-Office and SLAM portal
- 8.7.12 Duties, responsibilities, and role of Junior Engineer: To motivate the staff working under him for punctuality, developing a positive attitude and increasing production

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