

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 15999/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Junior Engineer/Elect./G (Level-6).
Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.
(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Junior Engineer/Elect./G (Level-6), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16000/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Tech-III/Elect./G (Level-2).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Tech-III/Elect./G (Level-2), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16001/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Tech-III/Elect./AC (Level-2).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

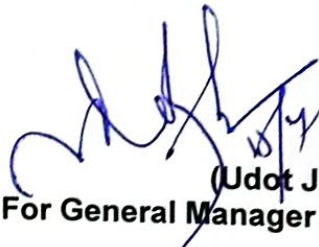
(ii) SEE/PIg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Tech-III/Elect./AC (Level-2), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16002/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Tech-III/Elect./TL (Level-2).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Tech-III/Elect./TL (Level-2), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16003/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of JE/Elect./TRD (Level-6).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of JE/Elect./TRD (Level-6), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above



(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16004/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Tech-III/Elect./TRD (Level-2).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

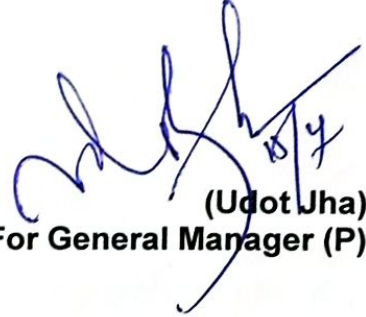
(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Tech-III/Elect./TRD (Level-2), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16005/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of JE/TRS (ELS & RSO) (Level-6).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

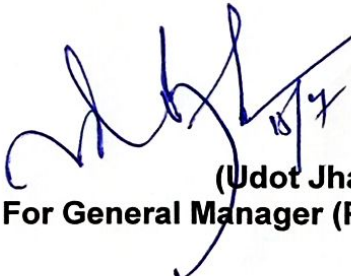
(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of JE/TRS (ELS & RSO) (Level-6), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda Housr, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16006/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

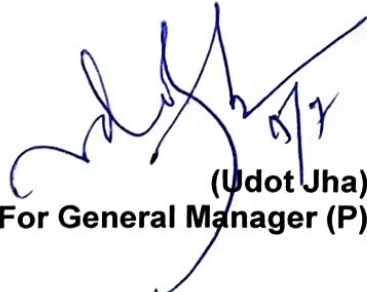
Sub: - Syllabus for selection for the post of Tech-III/TRS (ELS & RSO) (Level-2).
Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.
(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Tech-III/TRS (ELS & RSO) (Level-2), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda Housr, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16007/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Chief Loco Inspector (Level-7).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Chief Loco Inspector (Level-7), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16008/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Assistant Loco Pilot (Level-2).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

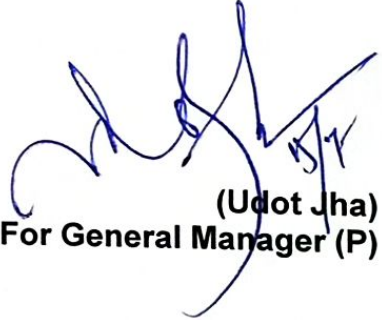
(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Assistant Loco Pilot (Level-2), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda House, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16009/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of JE/EMU (Level-6).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of JE/EMU (Level-6), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above



(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda Housr, NDLS for uploading on the website.

NORTHERN RAILWAY

Headquarters Office
Baroda House
New Delhi.

P.S.No. 16010/2025

NO: - 752-E/Elect./EIIA (317090)

Date: 15.07.2025

DRM:- DLI, UMB, FZR, MB, JAT & LKO.
CWM:- JUDW, AMV-LKO, CB-LKO & ASR

Sub: - Syllabus for selection for the post of Tech-III/EMU (Level-2).

Ref: -(i) PCPO letter no. PCPO/sel./2025 dated 15.05.2025.

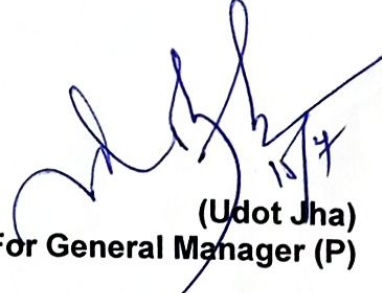
(ii) SEE/Plg/Elect. letter No. 186-Elect./G/Policy/EM/O, dated 23.06.2025

In reference to above subject, the syllabus for selection to the post of Tech-III/EMU (Level-2), is enclosed herewith for your information and necessary action please.

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

Hindi version will follow.
Please acknowledge the receipt.

DA/As above


(Udot Jha)
For General Manager (P)

Copy to:

1. All PHODs and All Officers of Personnel Deptt., HQ Office, Baroda House, New Delhi.
2. General Secy./NRMU, 12 Chelmsford Road, New Delhi.
3. General Secy./URMU, 166/2, P.K Road, New Delhi.
4. Genl. Secy./AIOBC Rly Emp. Asso. 171/A3, Basant Lane, New Delhi.
5. Zonal 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, HQ Office, Baroda Housr, NDLS for uploading on the website.

SYLLABUS FOR THE SELECTION IN THE CATEGORY OF JE (ELECT.)

I. GENERAL POWER SUPPLY:

- a. **BASIC ELECTRICAL UNITS:** Definitions and their relations, Volts, Amperes, Ohm, Capacitance, Impedance, Resistance, Series & Parallel connections.
- b. **ELECTRICAL MEASURING INSTRUMENTS & MEASUREMENTS:** Types of Electrical measuring Instruments and their applications, AC, DC instruments, their connections, arrangements, types, latest instruments.
- c. **ELECTRICAL MACHINES:** Various types of Motor viz. single phase and three phase induction motors, Generators/Alternators, their constructions, various parts, their functions and connections. Starters for motors, application of various types of motors.
- d. **TRANSFORMERS:** Power transformers, distribution transformers, Parallel operation of 3 phase transformers, Current transformers, Voltage Transformers, Transformation ratio functions, simple calculations, capacity rating, current voltage ratios.
- e. **CABLES:** Types, Grades construction, usage, rating, capacity, methods of laying underground and overhead cables, Fault detection, Methods of laying cables across Railway tracks, testing and commissioning.
- f. **WIRING:** Types and various accessories, testing types and various accessories, Quarter wiring/ Stair case wiring, commissioning, grades & capacity of wires used and safety equipment. Types, mechanism and proper rating of MCB, MCCB, RCCB, RCBO.
- g. **TRANSMISSION OF ELECTRICAL ENERGY:** Knowledge of 33 KV and 11 KV overhead and underground cables.
- h. **INSULATION MATERIALS:** Knowledge of various insulation methods, grades, insulation, types, compounds, break down values and units of measurements.
- i. **LIGHTING FITTINGS:** Various types of lights in stations, yards and other railways installations. High masts and their parts, various Lighting poles.
- j. **TOOLS & PLANT:** Knowledge of various tools used for electrical works and measuring testing instruments and knowledge of their use.
- k. **CONTROL SWITCHGEAR:** Knowledge of various control equipment, their purpose. grade, rating, capacity, various types of switches for LT & HT circuit.
- l. **SUB-STATION and EARTHING:** Layout of 33 KV, 11 KV substations. Protective equipment and maintenance schedule. Record keeping, procedures for arranging permit to work etc. Basics of earthing, Types of earthing, earthing values of various installations. Metering, Billing and Tariffs.
- m. **SAFETY PRECAUTIONS AND FIRST AID:** Precautions to be taken while working in electrical installations. Action to be taken in case of accidents viz. CPR, first aid. Firefighting and use of fire extinguishers in case of electrical fires.
- n. **PUMPS:** Types of pumps used in railway installations, their construction, names of various parts, efficiency rating, capacity, suction, delivery head, erection, testing

- &commissioning. Pressure gauges, control valves, strainer foot valve, precautions for starting, safety equipment & protection arrangement, trouble shooting and remedies.
- o. **AIR CONDITIONING & REFRIGERATION:** Basics of air conditioning viz. temperature, humidity, dehumidification, dry and wet bulb temperatures. Basic knowledge and types of AC's and water coolers used in Indian railways. Types of refrigerants, Type of compressors, Basic of refrigerator cycle. Operations and maintenance of various AC/refrigeration equipment. Trouble shooting and their remedies.
 - p. **BATTERIES:** Type of batteries, construction, knowledge of charging and discharging their maintenance, checking of Specific gravity, Precautions to be taken while maintenance.
 - q. **ENERGY CONSERVATION:** Various energy conservation measures adopted in Indian railways viz. Power factor improvement, Energy Efficient fittings, Solar energy harness, fuel consumption on DG Set, BEE star rating appliances, ECBC codes.
 - r. **LIFTS AND ESCALATORS:** Basics of Lifts and escalators and their parts, safety provision and basic troubleshooting in lifts and escalators. Maintenance schedule of lifts and escalators.
 - s. **DG Sets:** Basics of DG sets, Latest CPCB norms of DG sets, Basic operation and maintenance of DG sets.
 - t. **SOLAR PANELS:** Basic principle of Energy conversion from solar panels, Types of solar panels. Main parts of Solar plant, Basics of On-grid and Off grid solar plants. Net metering of solar plants.

2. TRAIN LIGHTING AND AIR CONDITIONING: Types of Coaches used in Indian railways. Systems of Train Lighting and Air conditioning in coaches, Self-Generating Coaches, ICF TL/AC Coach Generation system. Equipment, circuits and protection in ICF TL/AC coaches. Emergency feed extension in coaches. EOG and HOG systems in coaches - Hotel Load converter and Interlocking panel. Equipment, power circuits and protection systems in LHB TL/AC coaches, Power car and Pantry car. Air Conditioning in ICF/LHB coaches. Maintenance schedules of ICF and LHB coaches. Duties of ACCI/ACCA. Pre-cooling of AC Coaches. Fire causes and prevention measures in coaches. SMIs, Modification Sheets and Technical circulars issued by RDSO and instructions by Railway Board and RDSO, Schedule and procedure of thermal scanning.

3. MATERIAL MANAGEMENT IN RAILWAYS:

- a) Introduction to material management.
- b) Organizational structure of material management organization of Indian Railways
- c) Functions of material management- Planning and inventory management (Stock items, PL no. & non stock items), procurement, receipt and inspection & handling of rejection etc.
- d) Model SOP, IRS-condition of contract, Store Depot working, stock verification & audit, Scrap disposal.
- e) Non stock procurement under works programme, RSP, M&P, E-procurement, IREPS, GEM procurement etc.

4. CONTRACT MANAGEMENT & FINANCIAL MANAGEMENT:

- a) **Contract management**
 - Tenders & Contracts

- Vigilance

b) Financial Management

- Railway accounting and financial procedures
- Primary units, various demands
- Works programme, M&P and RS programme
- Stages of budgeting (Revised and Budget estimates, Review, Final Modification)
- Roles of JE & SSE in Tenders & Contracts

5. GENERAL & ESTABLISHMENT KNOWLEDGE:

- D&AR Rules: Various definitions, the applicability, suspension and issue of minor penalty charge sheet, appeals
- HOER Categories, Industrial relations and roles of trade unions.
- Various types of leaves which can be granted to staff.
- Railway Service Conduct Rules.
- General knowledge about working in various other departments in Railways
- Knowledge about Pass, PTO, Travel on duty, increment, Promotion of artisans, Quarters, Staff welfare, Allowances etc.
- Basics of RTI and Disabilities Acts and our obligations & responsibilities.
- Establishment powers of JE & SSE in open line.

6. COMPUTER FUNDAMENTALS:

- Basics of hardware and software, Semiconductors, Gates, Diodes.
- Operating systems basics
- Internet, E-mails, MS-office and useful apps.

8. राजभाषा

- राजभाषा- संवैधानिक प्रावधान,
- राजभाषा अधिनियम 1963 (यथा संशोधित 1976),
- संविधान की आठवीं अनुसूची में शामिल भाषाएँ,
- राजभाषा कार्यान्वयन समिति,
- राजभाषा प्रोत्साहन /पुरस्कार योजनाएँ,
- हिंदी प्रशिक्षण

9. General Knowledge, Reasoning, Aptitude.

SYLLABUS FOR THE SELECTION IN THE TECH POWER GRADE-3

1. Basic principles of electricity: clear understanding of current, voltage, power, resistance, impedance, use of common electrical measuring instruments.
2. Knowledge about Earthing, Overhead lines, transformers, wiring, Starters, etc.
3. Knowledge about various motors used in general power service.
4. Knowledge about ceiling fans, desert coolers, BLDC fans and other type of fans used in general power service. Different sizes of cables.
5. Basics of Wiring.
6. Different types of pumps for water supply.
7. Method of Energy conservation.
8. Protections to be taken in House Wiring.
9. Safety precautions to be taken while working on electric line/ equipment.
10. Tools used by a wireman.
11. Different types of light fittings.
12. Different type of lighting poles, high mast towers and their earthing.
13. Different types of Starters.
14. Solar Gate Light / Solar Water Heater
15. Basics of solar plant and inverters.
16. Various types of LED lights.
17. Parts of Lifts and escalators and basic troubleshooting during manning of lifts and escalators.
18. Establishment rules (HRMS, UMID, RESS, Leave rule, D&AR rule, Pass rules etc.),
19. Rajbhasha – Hindi Rajbhasha Rules 1976 and its applicability on Railways,
20. General Knowledge, Reasoning, Aptitude.

Syllabus for Selection for the post of **TECHNICIAN Air Conditioning Fitter**

1. Air Conditioning

Theory of SG/MOG/EOG/HG scheme and their schematic diagrams, Air Conditioning systems on Coaches-basis theory and practice of air conditioning, air conditioning system on coaches, LHB coaches alternator, Rectifier/regulator, types of alternator failures and their remedies familiarization with major equipment used and their rating, rating of batteries for different type of AC coaches, microprocessor based drives, maintenance schedule and practices of AC coaches. Transformer and their working and protection system. Use of luminaries in AC-TL coaches

Refrigeration cycle, water cooler, window/ split type window ac, split type water cooler, pantry equipment. Working of Dayna drive for Alternator testing. Maintenance schedule of AC-TL coaches: Trip maintenance, Monthly maintenance & IOH of coaches, Schedule and procedure of thermal scanning. Procedure of passing of AC-TL coaches in platform attention. Difference between conventional & RMPU type AC coaches. Troubleshooting of AC-TL coaches in passing trains. Troubleshooting of AC-TL coaches in Trip maintenance. Maintenance schedule of EOG rakes including power car. Earth test of AC/TL coaches.

2. Batteries

Types of batteries/comparison, care and maintenance of lead acid batteries and methods of charging of batteries. Initial charging of batteries, battery charger. Advantages of sealed maintenance free batteries.

3. General

Coach wiring diagram complete with connections of main switch, IE rules, tests checks of new wiring before energisation, basic electricity i.e. voltage, current, power, power factor and connections of voltmeter, ammeter, Wattmeter etc. energy consumption monitoring, steps to reduce energy consumption, calculation of energy consumption. Various types of switchgears. such as MCB, MCCB, ELCB, & their application and their maintenance schedules, maintenance/operation and protection system of coaches. Safeties while working on TL coach. Procedure of shock treatment, first-aid and firefighting, safety rules. Electrical accidents-precaution & prevention.

4. IE Rules and earthing arrangements

IE rules in-connection of distribution system and use of electricity, role of electrical inspector, Electrical inspector Govt. of India, procedure of earth testing of coach.

5. Energy Conservation and Energy Efficiency

Energy conservation measures for train lighting coach, short note of solar coach, what is power factor, disadvantages of low power factor and methods of power factor improvement, LED lights, BLDC fans.

6. Illumination

Knowledge of various types of lamps, their working & applications and their comparison, energy efficient lamps, lux levels for coaches.

7. Establishment rules

HRMS, UMID, RESS, Leave rule, D&AR rule, Pass rules, Allowances, HOER etc

8. Rajbhasha

Hindi Rajbhasha Rules 1976 and its applicability on Railways

9. General Knowledge, Reasoning, Aptitude.

Syllabus for selection for the post of **TECHNICIAN-Train Lighting Fitter**

1. Train lighting

Introduction to train lighting systems, theory of SG/MOG/EDG/HOG/schemes and their schematic diagrams, alternator, Rectifier/Regulator, types of alternator failures and their remedies, coach wiring, lighting and fan, BLDC fans, maintenance links, maintenance schedule and activities, trouble shooting of various types of failure of alternator, regulator and batteries and improvement suggestions. Causes of V-belts drop age in SG coaches and remedies. Fire prevention measures in coaches and fire-fighting familiarization with equipment used and their rating in coaches, rating of batteries for different type of coaches and fuses for different circuits. Maintenance schedule of AC-TL coaches: Trip maintenance, Monthly maintenance & IOH of coaches, Schedule and procedure of thermal scanning. Working of Dayna drive for Alternator testing. Maintenance schedule of AC-TL coaches, LHB Coaches, AC equipment's, Power cars: Trip maintenance, Monthly maintenance & IOH of coaches, Schedule and procedure of thermal scanning, Safety Features. Use of luminaries in AC-TL coaches. Troubleshooting of AC-TL coaches in passing trains.

2. Batteries

Types of batteries/comparison, care and maintenance of lead acid batteries and methods of charging of batteries, initial charging of batteries, battery charger. Advantages of sealed maintenance free batteries.

3. General

Coach wiring diagram complete with connections of main switch, IE rules, tests checks of new wiring before energisation basic electricity i.e. voltage, current, power, power factor and connections of voltmeter, ammeter Wattmeter etc. energy consumption monitoring, steps to reduce energy consumption, calculation of energy consumption. Various types of switchgears such as MCB MCCB, ELCB & their application and their maintenance schedules, maintenance/operation and protection system of coaches. Safety while working on TL coach Procedure of shock treatment, first-aid and firefighting, safety rules. Electrical accidents-precaution & prevention.

4. IE Rules and earthing arrangements

IE rules in-connection of distribution system and use of electricity, role of electrical inspector, Electrical inspector Govt. of India for Northern railway, procedure of earth testing of coach.

5. Energy Conservation and Energy Efficiency

Energy conservation measures for train lighting coach, short note of solar coach, what is power factor, disadvantages of low power factor and methods of power factor improvement, LED lights BLDC fans.

6. Illumination

Knowledge of various types of lamps, their working & applications and their comparison, energy efficient lamps, lux levels for coaches

7. Establishment rules

HRMS, UMID, RESS, Leave rule, D&AR rule, Pass rules, Allowances, HOER etc

8. Rajbhasha

Hindi Rajbhasha Rules 1976 and its applicability on Railways

9. General Knowledge, Reasoning, Aptitude.

Syllabus for the selection of Junior Engineer/TRD

1	Introduction to working of Railway organization and electrical department set up, functions of various streams	<ul style="list-style-type: none"> a. General introduction to Indian Railways – Brief History, salient features. b. Organizational structure - Railway administration/ Railway Board setup, Zonal/HQ setup, Divisional setup etc. c. Introduction to Electrical Department- organizational structure, functions, role of electrical department in Railways. d. Brief history and salient of electric traction on Indian Railway. e. Various units of Railways, Major Workshops, Production units, RDSO etc. f. Duties of JE/ SSEs.
2	General description of fixed installation	<ul style="list-style-type: none"> a. Power supply arrangement at Traction sub-stations. b. Power supply for signaling. c. Remote Control and Communication arrangements. d. Communication facilities. e. Traction Power Control. f. Overhead Equipment
3	Power supply for traction	<ul style="list-style-type: none"> a. Supply system. b. Liaison with power supply authorities. c. Tariff for traction. d. Monthly meter reading. e. Scrutiny of bills. f. Power factor improvement g. Shut down of traction supply. h. Statical data regarding energy consumption. i. Open Access
4	Principles for Layout Plans and Sectioning Diagrams	<ul style="list-style-type: none"> a. Introduction & Definitions. b. Sectioning arrangement. c. Numbering of OHE masts. d. Numbering of equipment. e. Numbering of elementary sections
5	Overhead Equipment-I	<ul style="list-style-type: none"> a. Duties of JE (OHE). b. Foundations for OHE Structures. c. OHE Structures d. Cantilever Assembly e. Regulating Equipment f. Section Insulator g. Isolators, Droppers h. Neutral Section i. Conductors j. Tension length k. Overlap l. Jumpers m. contact wire height n. Stagger o. Encumbrance p. Span Length q. Implantation/Setting Distance r. Turnout and Crossover s. Clearances

		<ul style="list-style-type: none"> t. Bonding and Earthing u. Transmission lines
6	Overhead Equipment-II	<ul style="list-style-type: none"> a. Maintenance schedule for overhead equipment. b. Foot patrolling of OHE. c. Footplate inspection. d. Tower wagon operation, maintenance and safety while working. e. Safety rules for OHE. f. Current collection test (OLIVER-G) g. Environment effect on OHE. h. Schedule of inspection. i. Investigation of OHE failure. j. Documents to be kept for work on OHE.
7	Power Supply Installations - I	<ul style="list-style-type: none"> a. Duties of JE (PSI) b. Traction Power Transformers c. Circuit breaker, Interrupter and Isolator d. Auxiliary Transformer e. Current Transformer f. Potential Transformer g. Lighting Arrestor h. Capacitor Bank i. Bonding and Earthing j. Batteries and Battery chargers k. Numbering Scheme in PSI
8	Power Supply Installations - II	<ul style="list-style-type: none"> a. Protective system and Relay setting calculations. b. Maintenance Schedule for power supply installations. c. Energy conservation measures for Traction installations d. Safety during working at power supply installations e. Uses of Thermo- Vision Camera, Conditioning Monitoring PSI Equipment's. f. Investigation of PSI failure.
9	2X25 kV ac Traction System	<ul style="list-style-type: none"> a. Introduction and description of 2X25kV ac Traction System.
10	High Rise OHE	<ul style="list-style-type: none"> a. Various parameters of High Rise OHE.
11	Remote Control and SCADA system	<ul style="list-style-type: none"> a. Introduction. b. Duties of JE (RC) c. Salient features of SACDA d. System Description e. Investigation of SCADA failure. f. Maintenance schedule.
12	Traction Power Control	<ul style="list-style-type: none"> a. Operation b. Duties of CTPC and TPC c. Power blocks and PTW d. Joint procedure order
13	Breakdown and Electrical accidents	<ul style="list-style-type: none"> a. Sub-station and switching station breakdown b. Breakdown of RC equipment c. OHE breakdown d. Electrical accidents e. Emergency stores and breakdown equipment
14	Railway Electrification	<ul style="list-style-type: none"> a. Introduction b. Survey Team & its work. c. Foot by foot survey. d. Abstract Estimate and Cost Benefit Analysis.

		<ul style="list-style-type: none"> e. Detailed estimate. f. Format of the project report g. Commissioning of Electrical Installations and EIG Sanction. h. Works programme, machinery & plant Programme and rolling stock programme.
15	Preparation for commissioning	<ul style="list-style-type: none"> a. Pre-commissioning inspections of new lines/ sections. b. Commissioning of transformers, Circuit breakers, interrupters, current transformer, potential transformer & Auxiliary transformers etc. c. Detailed joint inspection of OHE. d. Insulation tests. e. Continuity tests.
16	Safety precautions on electrified section	<ul style="list-style-type: none"> a. Station working rules- movements of tower car, caution order, safe working rules in 25 kV & 2x25 kV territory, G&SR relating to tower car. b. Protection of staff against traffic movements and protection of trains. c. Induction effects of 25 kV ac 50 Hz Single Phase Traction. d. Working of Diesel locomotives and steam locomotive in electrified section. <ul style="list-style-type: none"> • Watering of carriage in electrified sections- basic precautions, watering section, sequence of interlocking & Operation, persons authorized to open switches, custody of keys, key register, Loss of keys. e. Loading & unloading of petroleum products: - f. Rules applicable to Permanent Way Staff. g. Rules for S&T installations. h. Over Dimensioned Consignments (ODC) & JPOs. i. Other Precautions: - <ul style="list-style-type: none"> • Movement of Rubber Tyred Vehicles on Railway Wagons. • Hording Boards. j. Competency Certificate: - <ul style="list-style-type: none"> • Competency certificate and courses for Station Masters/pointsman to operate isolators. k. Regulations for power line crossings of Railway track- Maintenance schedule & items to be attended. l. Induction effect on nearby LT lines and yard lighting. m. Safety precautions to be taken for PF shelters, fencing, FOBs while working in the vicinity of 25 kV. n. Operation & importance of locking of interlocked isolators. o. Importance of permit to work, earthing, bonding, temporary jumpering of rails in case of rail fracture/ rail changing. p. New technology & case studies.
17	Electrical Accidents	<ul style="list-style-type: none"> a. General safety rules, importance of safety belts, helmets, ladders. b. Electrical shock causes, Prevention & treatment etc. c. Preventive measures to avoid electrical accident. d. Measures to be taken in case of electrical accident. e. Case studies and discussion f. Fire causes and safety measures and various codes. g. First aid for injury, burns etc.

18	IE Rules and Energy Conservation	<ul style="list-style-type: none"> a. Brief on I.E. Rules, Energy Conservation Act, BEE, ECBC Code, Information on star rated products, etc. b. Global Warming & climate change, clean development mechanism and carbon credits, etc. c. Solar Energy Application d. Energy efficiency measures in Electrical department
19	Energy conservation	<ul style="list-style-type: none"> a. Monitoring of Energy Conservation b. Energy conservation measures for Traction Installation. c. New developments. d.
20	Familiarization with other departments to understand their working and inter department coordination	<ul style="list-style-type: none"> a. Electrical Inspector General (EIG) sanction b. Overview of Codes, manuals and other publications of electrical department issued by Railway board, RDSO etc. c. Renewable Energy Sources- Solar energy, wind energy etc. d. Working of control office/ TPC/ TLC. e. P-Way maintenance/ assets f. Sick lines, C&W depot/ activities g. Signalling & tele-communication/ RRI working
21	Disaster Management	<ul style="list-style-type: none"> a. Introduction to Disaster management, NDRF, SDRF etc. b. Organizational infrastructure to effectively combat disaster (medical accessories, relief train, essential materials). c. Accident & break down management, preventive steps. d. Analysis of breakdowns, case studies and discussion
22	MATERIAL MANAGEMENT IN RAILWAYS:	<ul style="list-style-type: none"> a) Introduction to material management. b) Organizational structure of material management organization of Indian Railways c) Functions of material management- Planning and inventory management (Stock items, PL no. & non stock items), procurement, receipt and inspection & handling of rejection etc. d) Model SOP, IRS-condition of contract, Store Depot working, stock verification & audit, Scrap disposal. e) Non stock procurement under works programme, RSP, M&P, E-procurement, IREPS, GEM procurement etc.
23	CONTRACT MANAGEMENT & FINANCIAL MANAGEMENT:	<ul style="list-style-type: none"> a) Contract management <ul style="list-style-type: none"> - Tenders & Contracts - Vigilance b) Financial Management <ul style="list-style-type: none"> - Railway accounting and financial procedures - Primary units, various demands - Works programme, M&P and RS programme - Stages of budgeting (Revised and Budget estimates, Review, Final Modification) - Roles of JE & SSE in Tenders & Contracts
24.	GENERAL & ESTABLISHMENT KNOWLEDGE:	<ul style="list-style-type: none"> a) D&AR Rules: Various definitions, the applicability, suspension and issue of minor penalty charge sheet, appeals

		<ul style="list-style-type: none"> b) Rules for engagement and discharge of casual labours / substitutes and knowledge of relevant sections, Industrial relations and roles of trade unions. c) Various types of leaves which can be granted to staff. d) Railway Service Conduct Rules. e) General knowledge about working in various other departments in Railways f) Knowledge about Pass, PTO, Travel on duty, increment, Promotion of artisans, Quarters, Staff welfare, Allowances, HOER etc. g) Basics of RTI and Disabilities Acts and our obligations & responsibilities. h) Establishment powers of JE & SSE in open line.
25	COMPUTER FUNDAMENTELS:	<ul style="list-style-type: none"> a) Basics of hardware and software, semiconductors, diodes and gates b) Operating systems basics c) Internet, E-mails, MS-office and useful apps
26	राजभाषा	<ul style="list-style-type: none"> a.राजभाषा- संवैधानिक प्रावधान, b.राजभाषा अधिनियम 1963 (यथा संशोधित 1976), c.संविधान की आठवीं अनुसूची में शामिल भाषाएँ, d.राजभाषा कार्यन्वयन समिति, e.राजभाषा प्रोत्साहन /पुरस्कार योजनाएं, f. हिंदी प्रशिक्षण
28	General Knowledge, Reasoning, Aptitude.	

Syllabus for the selection of Tech-III/TRD

1	Introduction to working of Railway organization and electrical department set up, functions of various streams	<ul style="list-style-type: none"> a. General introduction to Indian Railways – Brief History, salient features. b. Organizational structure - Railway administration/ Railway Board setup, Zonal/HQ setup, Divisional setup etc. c. Introduction to Electrical Department- organizational structure, functions, role of electrical department in Railways. d. Brief history and salient of electric traction on Indian Railway. e. Various units of Railways, Major Workshops, Production units, RDSO etc. f. Duties of Tech./TRD.
2	General description of fixed installation	<ul style="list-style-type: none"> a. Power supply arrangement at Traction sub-stations(TSS). b. Power supply for signaling. c. Remote Control and Communication arrangements. d. Communication facilities. e. Traction Power Control. f. Overhead Equipment g. Numbering of elementary sections
3	Principles for Layout Plans and Sectioning Diagrams	<ul style="list-style-type: none"> a. Introduction & Definitions. b. Sectioning arrangement. c. Numbering of OHE masts. d. Numbering of equipments.
4	Overhead Equipment-I	<ul style="list-style-type: none"> a. Foundations for OHE Structures. b. OHE Structures c. Cantilever Assembly d. Regulating Equipment e. Section Insulator f. Isolators, Droppers g. Neutral Section h. Conductors i. Tension length j. Overlap k. Jumpers l. contact wire height m. Stagger n. Encumbrance o. Span Length p. Implantation/Setting Distance q. Turnout and Crossover r. Clearances s. Bonding and Earthing t. Transmission lines
5	Overhead Equipment-II	<ul style="list-style-type: none"> a. Maintenance schedule for overhead equipment. b. Foot patrolling of OHE. c. Footplate inspection. d. Tower wagon operation, maintenance and safety while working. e. Safety rules for OHE.

		<ul style="list-style-type: none"> f. Current collection test (OLIVER-G) g. Environment effect on OHE.
6	Power Supply Installations - I	<ul style="list-style-type: none"> a. Traction Power Transformers b. Circuit breaker, Interrupter and Isolator c. Auxiliary Transformer d. Current Transformer e. Potential Transformer f. Lighting Arrestor g. Capacitor Bank h. Bonding and Earthing i. Batteries and Battery chargers j. Numbering Scheme in PSI
7	Power Supply Installations - II	<ul style="list-style-type: none"> a. Protective system and Relay setting. b. Maintenance Schedule for power supply installations. c. Safety during working at power supply installations d. Uses of Thermo- Vision Camera, CONDITIONING Monitoring PSI Equipment's.
8	2X25 kV ac Traction System	<ul style="list-style-type: none"> a. Introduction and description of 2X25kV ac Traction System.
9	High Rise OHE	<ul style="list-style-type: none"> a. Various parameters of High Rise OHE.
10	Remote Control and SCADA system	<ul style="list-style-type: none"> a. Introduction. b. Salient features of SACDA c. System Description d. Maintenance schedule.
11	Traction Power Control	<ul style="list-style-type: none"> a. Operation b. Duties of CTPC and TPC c. Power blocks and PTW
12	Breakdown and Electrical accidents	<ul style="list-style-type: none"> a. Sub-station and switching station breakdown b. Breakdown of RC equipment c. OHE breakdown d. Electrical accidents
13	Preparation for commissioning of new assets	<ul style="list-style-type: none"> a. Pre-commissioning inspections. b. Detailed joint inspection of OHE.
14	Safety precautions on electrified section	<ul style="list-style-type: none"> a. Movements of tower car, caution order, safe working rules in 25 kV & 2x25 kV territory. b. Protection of staff. c. Induction effects of 25 kV ac 50 Hz Single Phase Traction. d. Over Dimensioned Consignments (ODC) & JPOs. e. Regulations for power line crossings of Railway track- Maintenance schedule & items to be attended. f. Safety precautions to be taken for PF shelters, fencing, FOBs while working in the vicinity of 25 kV. g. Operation & importance of locking of interlocked isolators. h. Importance of permit to work, earthing, bonding, temporary jumpering of rails in case of rail fracture. i. New technology & case studies.
15	Electrical Accidents	<ul style="list-style-type: none"> a. General safety rules, importance of safety belts, helmets, ladders. b. Electrical shock causes, Prevention & treatment etc. c. Preventive measures to avoid electrical accident.

		d. Measures to be taken in case of electrical accident. e. Fire causes and safety measures and various codes. f. First aid for injury, burns etc.
16	Establishment rules (HRMS, UMID, RESS, Leave rule, D&AR rule, Pass rules, HOER and Allowance etc.),	
17	Rajbhasha – Hindi Rajbhasha Rules 1976 and its applicability on Railways,	
18	General Knowledge, Reasoning, Aptitude.	

Syllabus for the selection/written test for promotion to the post of Junior Engineer (JE)

Level-06 (GP-4200) against 25% intermediate Quota in Electrical/TRS Department. (ELC LRSO)

1. Introduction to Railway organization and Electric department set up,

Basic Electrical Engineering, Measuring tools/equipment's, AC Motors, DC Motors, Transformer, Power Electronics, Circuit theory etc.

Conventional and Three-phase electric locomotives - Inspection schedules of electric locomotives & their periodicity, Loco equipment's their inspection schedules and overhauling & testing, VCB, PT, Pantograph, Loco bogie and body, Wheel, Axle, Axle box, Axle box bearing, Hurth coupling, Direct drive of loco, Battery, Compressors, Traction motor, Transformer, Traction converter, Auxiliary converter, VCU, Hotel load converter, Cab equipment, Relay, Pressure switch, Contactor, Auxiliary motors, Harmonic filter, Pneumatic brake system & Brake panels, Types of loco brakes, Pneumatic valves etc.

Loco lifting and lowering, Bogie assembling and disassembling & measurement, Safety items related to bogie, Clearances of bogie & body, Under frame checking, Wheel measurement, Wheel profiling, Fault diagnosis, Loco equipment's abbreviation, Codes/Manuals/SMIs/MS/TC pertaining to conventional and three-phase electric loco, Testing/Failure investigation/Case studies on electric locomotive, Power & control circuit of loco, Material handling jigs and fixtures, Up keep of work environment, Disaster management, Safety rules, Precautions, Earthing of equipment, Energy conservation, Working of PPIO and SLAM, Seasonal drives of loco like Summer; Winter & Monsoon, Fire prevention measures, Safety items of loco, M&P and T&P & their maintenance. Safety precaution of electrified area.

Important loco features - KAVACH, RTIS, CVVRS, VSS, RMS, DPWCS, Push-Pull Operation etc.

2. MATERIAL MANAGEMENT IN RAILWAYS:

- a) Introduction to material management.
- b) Organizational structure of material management organization of Indian Railways
- c) Functions of material management- Planning and inventory management (Stock items, PL no. & non stock items), procurement, receipt and inspection & handling of rejection etc.
- d) Model SOP, IRS-condition of contract, Store Depot working, stock verification & audit, Scrap disposal.
- e) Non stock procurement under works programme, RSP, M&P, E-procurement, IREPS, GEM procurement etc.

3. CONTRACT MANAGEMENT & FINANCIAL MANAGEMENT:

- a) Contract management
 - Tenders & Contracts
 - Vigilance
- b) Financial Management
 - Railway accounting and financial procedures
 - Primary units, various demands

- Works programme, M&P and RS programme
- Stages of budgeting (Revised and Budget estimates, Review, Final Modification)
- Roles of JE & SSE in Tenders & Contracts

4. GENERAL & ESTABLISHMENT KNOWLEDGE:

- a) D&AR Rules: Various definitions, the applicability, suspension and issue of minor penalty charge sheet, appeals
- b) Rules for engagement and discharge of casual labours / substitutes and knowledge of relevant sections, Industrial relations and roles of trade unions.
- c) Various types of leaves which can be granted to staff.
- d) Railway Service Conduct Rules.
- e) General knowledge about working in various other departments in Railways
- f) Knowledge about Pass, PTO, Travel on duty, increment, Promotion of artisans, Quarters, Staff welfare, HOER, Allowances etc.
- g) Basics of RTI and Disabilities Acts and our obligations & responsibilities.
- h) Establishment powers of JE & SSE in open line.

5. COMPUTER FUNDAMENTELS:

- a) Basics of hardware and software
- b) Operating systems basics
- c) Internet, E-mails, MS-office and useful apps.

6. राजभाषा

- a. राजभाषा- संवैधानिक प्रावधान,
- b. राजभाषा अधिनियम 1963 (यथा संशोधित 1976),
- c. संविधान की आठवीं अनुसूची में शामिल भाषाएँ,
- d. राजभाषा कार्यान्वयन समिति,
- e. राजभाषा प्रोत्साहन / पुरस्कार योजनाएँ,
- f. हिंदी प्रशिक्षण

8. General Knowledge, Reasoning, Aptitude.

Syllabus for the selection/written test for promotion to the post of Tech-III Level-02 (GP-1900) against 25% Intermediate Quota in Electrical/TRS Department. (ELS & RSO)

Introduction to Railway organization and Electric department set up,

Basic Electrical Engineering, Measuring tools/equipment's, etc.

Safety Precaution in Electrified areas, Conventional and Three-phase electric locomotives - Inspection schedules of electric locomotives & their periodicity, Loco equipment's their inspection schedules and overhauling & testing, VCB, PT, Pantograph, Loco bogie and body, Wheel, Axle, Axle box, Axle box bearing, Hurth coupling, Direct drive of loco, Battery, Compressors, Traction motor, Transformer, Traction converter, Auxiliary converter, VCU, Hotel load converter, Cab equipment, Relay, Pressure switch, Contactor, Auxiliary motors, Harmonic filter, Pneumatic brake system & Brake panels, Types of loco brakes, Pneumatic valves etc.

Loco lifting and lowering, Bogie assembling and disassembling & measurement, Safety items related to bogie, Clearances of bogie & body, Under frame checking, Wheel measurement, Wheel profiling, Fault diagnosis, Loco equipment's abbreviation, Codes/Manuals/SMIs/MS/TC pertaining to conventional and three-phase electric loco, Testing/Failure investigation/Case studies on electric locomotive, Power & control circuit of loco, Material handling jigs and fixtures, Up keep of work environment, Disaster management, Safety rules, Precautions, Earthing of equipment, Energy conservation, Working of PPIO and SLAM, Seasonal drives of loco like Summer; Winter & Monsoon, Fire prevention measures, Safety items of loco, M&P and T&P & their maintenance.

Important loco features - KAVACH, RTIS, CVVRS, VSS, RMS, DPWCS, Push-Pull Operation etc.

Establishment rules (HRMS, UMID, RESS, Leave rule, D&AR rule, Pass rules, Allowances, HOER etc.),

Rajbhasha – Hindi Rajbhasha Rules 1976 and its applicability on Railways,

General Knowledge, Reasoning, Aptitude.

ANNEXURE-I

Syllabus for the post of Chief Loco Inspector

S N	Subject	Contents
1	General data, description and operation of AC loco (Three Phase and conventional AC loco including microprocessor & SIV based locos)	General data, Description on safety items - undergear safety fittings & intactness control circuit, Power circuit, Aux. circuit, Pneumatic circuit and brake system, under gear component description, different procedures, trouble shooting and working in faulty/ equipment's isolation condition etc. MU loco operation and troubleshooting, Precaution to avoid load stalling. Wheel skidding causes and precautions, measurements & permissible limits. Push Pull loco operation, VCD, PTDC. Monitoring & grading of drivers, SPM analysis, CVVRS.
2	WAG-12 loco	General data, difference between WAG-9 & WAG-12, Pneumatic circuit and brake system, under gear component description, different procedures, Different switches and lamps in driving cab panels. Different MCBs in Cab, Fault diagnosis and troubleshooting, working in faulty/ equipment's isolation condition etc.
3	EMU/MEMU and Three Phase EMU	General data, difference between EMU/MEMU & 3 phase EMU, Pneumatic circuit and brake system, under gear component description, different procedures, trouble shooting and working in faulty/ equipment's isolation condition etc. Different switches and lamps in driving cab panels. Different MCBs in Cab, fault diagnostic and Isolation options, Passing of Neutral section, precaution in case of ACP, Fire and troubleshooting
4	Vande Bharat	General data, difference between train & Train set-18. Types of brake system, under gear component description. TCAS, Different switches and lamps in driving cab panels. Different MCBs in Cab. Pantograph, Composition, TC grounding, TCMS, DDU operation, Rake de-energization and Dead hauled, fault diagnostic and Isolation options, Passing of Neutral section, precaution in case of ACP, Fire and troubleshooting
5	General data, description and operation of all DSL locos (ALCO/HHP/GE locos)	General data, different Operational Procedures, Pneumatic circuit and brake system, under gear component description, loco starting and shut down procedures, trouble shooting and working in faulty/ equipment's isolation condition etc. APU and VCD. General description of all types ALCO/HHP/GE locos, summarizing of locations of safety & important equipment on diesel locomotives and their importance.
6	New Technology equipment's	Description and working of RTIS, DPWCS, TPWS, KAVACH, FSD, RDAS, HOG, SLAM.
7	Traction Distribution	General Description of power supply (TSS, FP, SSP,SP), different boards and bonds used, neutral section and types of neutral section, Cantilever arrangement, Panto entanglement – causes and precautions, ATD device, feed extension, OHE

		supply, OHE failure - duties of driver and precautions, Tower wagon working
8	Carriage and wagon	Different types of coaching and goods rolling stock, brake system- type and working, reasons of brake binding-remedies and precautions. Air suspension system of rolling stock, FIBA working and its trouble shooting, Types of coupling, H type coupler. Flat tyre causes and precautions, measurements 7 permissible limits, its effect on rack and rolling stock. BPC and continuity – needs brake power percentage calculation, validity of BPC, Instructions of Close circuit rakes, GDR, GDR preparation and Train operation with invalid BPC, Precaution while stabling and clearing loads from road side station. Permissible limits of leakage in rolling stock & Joint testing of loco/load for BP & FP pressure.
9	S & T	Signals- classification, types and description of signals, classification of stations, Types of interlocking. Signal overlap, overlapping block section, Defective signals and Duties of Loco Pilot in case of defective signals, Reporting of defects regarding signals.
10	G&SR	Provision of G & SR for working trains in normal and abnormal conditions in absolute block system and automatic block signaling system, correction slips, Different types of working systems and their description, Knowledge of use of detonating signals, Protection in different system of working and in different conditions, Fog signals, working time table, Station working rules. Operating authorities in all system of working during normal and abnormal working. Automatic signaling system including Mid-section semi-automatic signaling system. Ghat rules for train operations.
11	P.Way	Different engineering boards and signals, Permanent and temporary speed restriction, Protection of working site by Engineering staff, reporting of track defects, Duties of Loco pilots in case of jerk/ track defective, level crossing.
12	Accidents	Classification of accident duties of driver in case of accident, Protection of train and assistance in restoration, Disaster management, provision of accident manual, duties of driver in case of fire on train/ explosion on track, types and use of fire extinguisher, first aid. Working of trains during storm. Prevention of SPAD
13	MATERIAL MANAGEMENT IN RAILWAYS:	<ul style="list-style-type: none"> a) Introduction to material management. b) Organizational structure of material management organization of Indian Railways c) Functions of material management- Planning and inventory management (Stock items, PL no. & non stock items), procurement, receipt and inspection & handling of rejection etc. d) Model SOP, IRS-condition of contract, Store Depot working, stock verification & audit, Scrap disposal. e) Non stock procurement under works programme, RSP, M&P, E-procurement, IREPS, GEM procurement etc.

14	CONTRACT MANAGEMENT & FIANANCIAL MANAGEMENT:	<p>a) Contract management</p> <ul style="list-style-type: none"> - Tenders & Contracts - Vigilance <p>b) Financial Management</p> <ul style="list-style-type: none"> - Railway accounting and financial procedures - Primary units, various demands - Works programme, M&P and RS programme - Stages of budgeting (Revised and Budget estimates, Review, Final Modification) - Roles of JE & SSE in Tenders & Contracts
15.	GENERAL & ESTABLISHMENT KNOWLEDGE:	<p>a) D&AR Rules: Various definitions, the applicability, suspension and issue of minor penalty charge sheet, appeals</p> <p>b) Rules for engagement and discharge of casual labours / substitutes and knowledge of relevant sections, Industrial relations and roles of trade unions.</p> <p>c) Various types of leaves which can be granted to staff.</p> <p>d) Railway Service Conduct Rules.</p> <p>e) General knowledge about working in various other departments in Railways</p> <p>f) Knowledge about Pass, PTO, Travel on duty, increment, Promotion of artisans, Quarters, Staff welfare etc.</p> <p>g) Basics of RTI and Disabilities Acts and our obligations & responsibilities.</p> <p>h) Establishment powers of JE & SSE in open line.</p>
16	COMPUTER FUNDAMENTELS:	<p>a) Basics of hardware and software, Semiconductors, Gates and diodes.</p> <p>b) Operating systems basics</p> <p>c) Internet, E-mails, MS-office and useful apps</p>
17	राजभाषा	<p>a.राजभाषा- संवैधानिक प्रावधान, b.राजभाषा अधिनियम 1963 (यथा संशोधित 1976), c.संविधान की आठवीं अनुसूची में शामिल भाषाएँ, d.राजभाषा कार्यान्वयन समिति, e.राजभाषा प्रोत्साहन /पुरस्कार योजनाएं, f. हिंदी प्रशिक्षण</p>
28	General Knowledge, Reasoning, Aptitude.	

Syllabus for the Post of ALP for 50% Departmental Quota

S N	Subject	Contents
1	Duties of Assistant loco Pilot	Roles, responsibilities, safety procedures, and operational protocols
2	General introduction/information of Diesel and Electric locomotives.	Basic working principles Types of locos, components, and systems involved
3	Speed Time and Distance	Concepts of motion Relative speed, time and work, trains, etc.
4	Establishment	Leave Duty Hours and Rest rules Pay Structures of Running staff Running allowances Other allowances Overtime allowances
5	General Awareness and Current Affairs	Indian Politics History Geography Economy Culture National and International Events Sports Awards Railway News
6	General Mathematics	Algebra Geometry Trigonometry Mensuration Statistics
7	Ratio and Proportion	Concepts and application of ratio Proportion, and partnership
8	General science	Basic concepts of physics, chemistry, and biology
9	General intelligence	Decision making Classification Coding-decoding Spatial orientation
10	Quantitative Aptitude	Basic arithmetic Number systems Simplification Percentages Averages
11	Reasoning Ability	Logical reasoning Puzzles Series Analogies Syllogism
12	Common Abbreviation	Frequently used abbreviations in railways and general administration
13	Important Government organization	Overview of major national and railway-related organizations and their roles

Syllabus for the selection/written test for promotion to the post of Junior Engineer Level-06 (GP-4200) against 25% intermediate Quota in Electrical/EMU Department.

1. INTRODUCTION TO WORKING OF RAILWAY ORGANIZATION AND ELECTRICAL DEPARTMENT SET UP

- a) General introduction to Indian Railways- Brief History, salient features.
- b) Organizational structure- Railway administration/ Railway Board setup, Zonal/HQ setup, Divisional setup etc.
- c) Introduction to Electrical Department- organizational structure, functions, role of electrical department in Railways.
- d) Organizational structure of Sheds/Workshops, sections of the shed & their functions.
- e) Various units of Railways, Major workshops, Production units, RDSO etc.
- f) Duties of JE/SSEs.

2. CONDITION MONITORING

- a) Basic concepts of Condition Monitoring of Electrical Equipment
- b) Condition Monitoring Techniques
 - DC tests- Insulation Resistance test etc.
 - AC tests- Capacitance & Tan Delta measurement, Partial Discharge, Transformer Electrical tests, etc.
- c) Condition Monitoring of Transformers- Theory and Practice of Dissolved Gas Analysis (DGA), BDV, Capacitance & Tan Delta measurement of winding and Bushings etc.
- d) Condition Monitoring of power cables
- e) Non-destructive testing techniques for crack detection like visual testing, Dye Penetrate Testing, Eddy current testing and Ultrasonic testing etc.

3. BASIC TECHNICAL KNOWLEDGE:

- a) Basic principles of electricity and magnetism, properties of electric materials, AC and DC power supply, Conductor, semi-conductor and insulators, Voltage, resistance, Power, Ohms law, Series and parallel connections, colour code for resistor, batteries etc.
- b) Basic electronics diodes, transistors, rectifiers, voltage stabilization and its applications.
- c) Knowledge of electric measuring instruments, their principles and construction
- d) General knowledge of servo motors, stepper motors welding control and servo control
- e) Knowledge of various electromechanical/magnetic control relay, contractors, micro switches, limit switch proximity or sensor switches etc. and their application in various machine tools and workshop equipment.

4. MAINTENANCE AND SERVICING:

- a) Trouble shooting techniques and modern repair techniques, proper use of electrical test instruments/equipment for trouble shooting and servicing of electrical/electronic systems.
- b) Knowledge of modern test and measuring equipment available in electrical repair shop and their application.
- c) Importance of preventive maintenance use of check lists, scheduling/ planning for maintenance work, maintenance log cards regarding EMU/MEMU rakes.
- d) Knowledge of Electrical installation of machinery and plant with specific attention to power space requirement and installation illumination, grounding methods of improving grounding resistance with special attention to electronically controlled machine.

- e) Knowledge of power and control circuit drawings component layout nomenclature, code of practice of engineering drawing, schematic symbols, free hand sketching of electrical circuits, relays contractor timers etc.

5. DISCIPLINE SPECIFIC KNOWLEDGE-EMU:

- a) General description of EMU/MEMU conventional & 3 phase rakes, their Acceleration and retardation, regenerative braking
- b) Difference between EMU and MEMU Type of Coaches (MC, TC and vendor coaches), Unit information of EMU and MEMU
- c) Maintenance schedule of Periodicity and major activities in conventional & 3 phase EMU/MEMU rakes, codes/manuals/SMIs related to EMU/MEMU, Trip/schedule inspection, testing protective device and relays, OHE isolation.
- d) Description of Mechanical items, Bogie, wheels, Gear, axle box, Coupler, side bearers, centre pivot, cattle guard, Roller bearings, air suspension bearing, Axle clearances, wheel defects, lubricants used etc.
- e) Traction Motor and Aux Motors, OHE, Pantograph, SPM and Pneumatic items- Compressor, Main reservoir, air dryer, Braking system, Brake binding etc.
- f) Function of Major and ratings equipment (Circuit breaker, ABB/VCB). Bushing/CHT, TF, Choke tank, Rectifier, switch gear, Tap changer. Function of Traction control management systems, HMI, PAPIS, Master controller, deadman's handle, all types of converters, DC link, electronic cards etc.
- g) General description of train lighting, cab items, battery items, Head light, flasher light, jumper, charger, Carriage fans, MCBs, fuses & their ratings, electrical equipment in HT/LT compartments.
- h) Passenger amenity items, body furnishing items, bio-toilets, RTIS, Fire Suppression & smoke detection system, Kavach working & limitations.

6. WELDING TECHNOLOGY:

- a) Basics of welding, Classification of various types of welding techniques, gas cutting, laser cutting etc. and their application
- b) Safety during welding and gas cutting
- c) Welding defects and prevention
- d) Classification, properties and selection of electrodes.

7. SHOP MANAGEMENT:

- a) Knowledge of functions of Time Office and procedure orders for gate passes. Knowledge of incentive scheme, work order system, booking of labour hours, documents processing.
- b) Various registers maintained in shops and their need. Stock verification authorities and periodicity.
- c) Various safety measures to be followed on the shop floor in general and for various machines and equipment in particular, availability of first aid, Earthing, insulation, circuit protection, Fire safety in electrical systems.
- d) Staff protective clothing and their entitlements.

8. MATERIAL MANAGEMENT IN RAILWAYS:

- a) Introduction to material management.
- b) Organizational structure of material management organization of Indian Railways
- c) Functions of material management- Planning and inventory management (Stock items, PL no. & non stock items), procurement, receipt and inspection & handling of rejection etc.
- d) Model SOP, IRS-condition of contract, Store Depot working, stock verification & audit, Scrap disposal.
- e) Non stock procurement under works programme, RSP, M&P, E-procurement, IREPS, GEM procurement etc.

9. CONTRACT MANAGEMENT & FINANCIAL MANAGEMENT:

a) Contract management

- Tenders & Contracts
- Vigilance

b) Financial Management

- Railway accounting and financial procedures
- Primary units, various demands
- Works programme, M&P and RS programme
- Stages of budgeting (Revised and Budget estimates, Review, Final Modification)
- Roles of JE & SSE in Tenders & Contracts

10. GENERAL & ESTABLISHMENT KNOWLEDGE:

- D&AR Rules: Various definitions, the applicability, suspension and issue of minor penalty charge sheet, appeals
- Industrial relations and roles of trade unions.
- Various types of leaves which can be granted to staff.
- Railway Service Conduct Rules.
- General knowledge about working in various other departments in Railways
- Knowledge about Pass, PTO, Travel on duty, increment, Promotion of artisans, Quarters, Staff welfare, Allowances, HOER etc.
- Basics of RTI and Disabilities Acts and our obligations & responsibilities.
- Establishment powers of JE & SSE in open line.

11. COMPUTER FUNDAMENTALS:

- Basics of hardware and software, Semiconductors, Gates and Diodes.
- Operating systems basics
- Internet, E-mails, MS-office and useful apps.

13. राजभाषा

- राजभाषा- संवैधानिक प्रावधान,
- राजभाषा अधिनियम 1963 (यथा संशोधित 1976),
- संविधान की आठवीं अनुसूची में शामिल भाषाएँ,
- राजभाषा कार्यन्वयन समिति,
- राजभाषा प्रोत्साहन / पुरस्कार योजनाएँ,
- हिंदी प्रशिक्षण

14. General Knowledge, Reasoning, Aptitude.

Syllabus for selection to the post of 'Tech.-III/EMU' is as follows:

1. INTRODUCTION TO WORKING OF RAILWAY ORGANIZATION AND ELECTRICAL DEPARTMENT SET UP:

- a. General introduction to Indian Railways- Brief History, salient features.
- b. Organizational structure- Railway administration/ Railway Board setup, Zonal/HQ setup, Divisional setup etc.
- c. Introduction to Electrical Department- organizational structure, functions, role of electrical department in Railways.
- d. Organizational structure of Sheds/Workshops, sections of the shed & their functions.
- e. Various units of Railways, Major workshops, Production units, RDSO etc.

2. BASIC SCIENCE AND ENGINEERING:

- a. Physics fundamentals: -Units, Measurements, Mass, Weight, Density, Work, Power, and Energy, Speed and velocity; Heat and Temperature.
- b. Electricity and Magnetism: Electric Charge, Field, and Intensity, Electric Potential and Potential Difference, Simple Electric Circuits, Conductors, Non-conductors/Insulators, Ohm's Law, Kirchhoff's Laws, series and parallel circuits.
- c. Electronic Devices and Circuits: Semiconductor devices, diodes, transistors, and basic electronic circuits

3. MATHEMATICS: Number system, BODMAS, Decimals, Fractions, LCM, HCF, Ratio and Proportion, Percentages, Mensuration, Time and Work; Time and Distance, Simple and Compound Interest, Profit and Loss, Square Root.

4. BASIC COMPUTER FUNDAMENTELS: Computer architecture, Input/Output devices, Storage devices, Networking, Operating systems, MS Office, Internet and Email & Computer Viruses.

5. DISCIPLINE SPECIFIC KNOWLEDGE-EMU:

- a. General description of EMU/MEMU conventional & 3 phase rakes, their Acceleration and retardation, regenerative braking.
- b. Difference between EMU and MEMU Type of Coaches (MC, TC and vendor coaches), Unit information of EMU and MEMU.
- c. Maintenance schedule of Periodicity and major activities in conventional & 3 phase EMU/MEMU rakes, codes/manuals/SMIs related to EMU/MEMU, Trip/schedule inspection, testing protective device and relays, OHE isolation.
- d. Description of Mechanical items, Bogie, wheels, Gear, axle box, Coupler, side bearers, centre pivot, cattle guard, Roller bearings, air suspension bearing, Axle clearances, wheel defects, lubricants used etc.
- e. Traction Motor and Aux Motors, OHE, Pantograph, SPM and Pneumatic items- Compressor, Main reservoir, air dryer, Braking system, Brake binding etc.
- f. Function of Major and ratings equipment (Circuit breaker, ABB/VCB). Bushing/CHT, TF, Choke tank, Rectifier, switch gear, Tap changer. Function of Traction control management systems, HMI, PAPIS, Master controller, deadman's handle, all types of converters, DC link, electronic cards etc.
- g. General description of train lighting, cab items, battery items, Head light, flasher light, jumper, charger, Carriage fans, MCBs, fuses & their ratings, electrical equipment in HT/LT compartments.
- h. Passenger amenity items, body furnishing items, bio-toilets, RTIS, Fire Suppression & smoke detection system, Kavach working & limitations.

8. MAINTENANCE AND SERVICING:

- a. Trouble shooting techniques and modern repair techniques, proper use of electrical test instruments/equipment for trouble shooting and servicing of electrical/electronic systems.
- b. Knowledge of modern test and measuring equipment available in electrical repair shop and their application.
- c. Importance of preventive maintenance use of check lists, scheduling/ planning for maintenance work, maintenance log cards regarding EMU/MEMU rakes.
- d. Knowledge of various drives- summer, winter, monsoon & safety drive etc.

9. Establishment rules (HRMS, UMID, RESS, Leave rule, D&AR rule, Pass rules, Allowances, HOER etc.),

10. Rajbhasha – Hindi Rajbhasha Rules 1976 and its applicability on Railways,

11. General Knowledge, Reasoning, Aptitude.