



PBC No. 276/2024

दक्षिण रेलवे Southern Railway
प्रधान मुख्य कार्मिक अधिकारी कार्यालय
Office of the Principal Chief Personnel Officer
प्रधान कार्यालय, कार्मिक विभाग, चेन्नै-600003
Headquarters, Personnel Department, Chennai-600003

सं/No: P(S)608/IX/JE/Sig. & JETele(Both PRQ&LDCE)

दिनांक/Dated: 23. 12.2024

All PHODs/ DRMs/ CWMs/ CEWE/ CAO/ CPM/ PDA/ Dy.CPOs/ Sr.DPOs/Secy to GM,
Chairman/RRB/MAS,TVC, Addl.Registrar/RCT/MAS, Secretary/RRT/MAS,
Principal /TC/PTJ Principal MDZTI/TPJ, SRCETC/TBM, ZETTC/AVD,
DPOs/SPOs/WPOs/APOs of HQ/Divisions /Workshops/Units.

विषय/Sub: Syllabus for the post of Junior Engineer/Signal(PRQ-40% & LDCE 20%)
and Junior Engineer/ Telecom (PRQ-30% & LDCE -20%) in Level- 6 –
S&T Dept- reg.

संदर्भ/Ref.: Rly. Bd's letter No.E(NG)/I/2022/PM1/36/dated 08.02.2024.

The Syllabus for the post of Junior Engineer/Signal (both PRQ-40% &LDCE-20%)
Junior Engineer/Telecom (**both PRQ-30% & LDCE-20%**) in Level- 6 for **Signal &
Telecom Department** duly approved by the Competent authority is enclosed
for information, guidance and necessary action.

संलग्नक/Encl.10 pages

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Anjanikumar C

Date: 23-12-2024 17:04:05

Reason: Approved

सहायक कर्मचारी संबंधी अधिकारी/Asst. Personnel Officer / IR & Trg.

कृते प्रमुकाधि/for Principal Chief Personnel Officer

प्रतिलिपि/Copy to: The General Secretary/DREU
The General Secretary/SRMU
The General Secretary/AISCTREA
The General Secretary/AIOBCREA
The General Secretary/NFIR
The Genera
IT Section/PB/HQ - to upload in the SR website.

JE/SIGNAL (PQ / LDCE)

SYLLABUS FOR THE EXAMINATION FOR SELECTION TO THE POST OF JE(SIG)

The question papers for the examination will consist of following Items:

1. General & Safety
2. Signalling & Interlocking
3. Electrical signalling (including Route Relay Interlocking)
4. Power Supply & lightning protection
5. Block signalling (including automatic block)
6. Signalling in General
7. Modern Railway Signaling
8. Stores & Accounts
9. Establishment Matters
10. Official language Policy and Rules

1. General & Safety:

1.1. General :

- a. Organization Structure of Railways and S&T Department.
- b. Organization Structure of S&T.
- c. G&SR:
 - (i) Absolute block working, Automatic block working, Signals in general, Location of various signals
 - (ii) Working of trains during total failure of communication
 - (iii) Knowledge of Hand signals
- d. Standard schedule of dimensions - 2004 with latest amendments
- e. Infringements - Maintenance of Infringements records.
- f. Must have adequate knowledge of all working rules, manuals and procedures including Block Working Manuals, Accident rules, Signal Engineering Manual, with particular reference to the field work of section signal engineers.
- g. Station working Rules.

1.2. Safety :

- a. Passenger Safety by duly following Safe working Rules
- b. Personal safety while working on the Railway Track, RE area, LC gates

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- c. Fire Safety-Automatic Fire Detection & Suppression System
- d. First aid and cleanliness.
- e. Protection of evidence at accident sites.
- f. Failure memo, disconnection / reconnection memos
- g. NI working
- h. Codal life of assets
- i. Safety Integrity Test.

2. Signalling & Interlocking :

- a. Principles of Interlocking as per SEM.
- b. Preparation of Signalling plans and Numbering MACLS, PI Layouts
- c. Preparation of Inter cabin slotting and related circuits.
- d. Signal control circuits for MACLS PI British type both route setting and non-route setting.
- e. Preparation and reading of TOCs.
- f. Basic knowledge of Selection circuits, Power signalling circuits, Route Holding, Back locking, Indication locking, approach locking, Lamp proving, Route Indicators, colour light signals, Impedance Bonds, Point Control, Detection Circuits, Automatic signalling etc., and its maintenance and testing, troubleshooting of failure of those equipment.

3. Electrical Signalling :

- a. Relays of various types used in Indian Railway
- b. DC track circuits & their components, initial adjustments, insulating of points & crossovers, etc. Preparation of track bonding diagrams for different layouts, (Series, parallel, series parallel). Periodical maintenance & breakdown attendance of field portion of Track Circuit, AFTC.
- c. Electric point machines, universal type and their working control and detection circuits, various checks to be carried out and measurements to be taken during maintenance. Periodical maintenance & breakdown attendance of field portion of Point.
- d. Colour light signalling, cutting in arrangement, Red lamp protection, LED signals. Periodical maintenance & breakdown attendance of field portion of Signals.
- e. Automatic-signalling & basic principles and circuits
- f. Signalling in RE.
- g. Electric Key transmitter and its wiring


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- h. Cables-various cables used in signalling, colour coding, parameters of cable, Insulation resistance value.
- i. Level crossing gates - Periodical maintenance & breakdown attendance of Interlocking arrangement of mechanical lifting barrier. Periodical maintenance & breakdown attendance of Sliding boom, Electrically Operated Lifting barrier, Road warning Signals, Hooter
- j. Measuring equipment-Multimeter, Voltmeter, Cable Meggering equipment, Hydrometer, Earth tester.

4. Power Supply & Lightning Protection :

- a. Various transformers, rectifiers, DC-DC converters used in signalling
- b. IPS-Components of various modules for wayside stations - Periodical maintenance of integrated power supply, chargers, Inverters, battery bank.
- c. Secondary cells (LMLA) initial charging, deciding of capacity of charger based on cells, Telecom application chargers used in signalling
- d. Solar Photo type cells and solar panels
- e. Generators.
- f. Lightning protection
- g. Earthing: Various types of earths used in signalling, measurements of earth value, maintenance free earth & ring earth
- h. Surge protection devices.
- i. Earth Leakage detector

5. Block Signalling :

- a. Push button type token less block instruments, PTJ type, Nomenclature of relays, working principles of various codes transmitted and received.
- b. Single line Daido type instruments, frequencies used in transmitting and receiving codes, general working
- c. SGE double line block instrument, lock and block circuit and LSS control circuit, "Dos & Don'ts"
- d. Automatic block signalling, circuits
- e. IBS working principles
- f. BPAC, Block panel, UFSBI, SSBPAC, In built block of EI.
- g. Working block telephones and their associated circuits.
- h. Installation, maintenance and testing and troubleshooting of failure of those equipment

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6. Signalling in General :

- a. Location of signals, various types of signals and their use
- b. Working of siding taking off from loop line, working of siding taking from mid block section
- c. Classification of LC Gates, rules for working of trolleys, duties of maintenance of signal supervisors
- d. Foot Plate inspection & Joint foot plate inspections
- e. Joint inspection of points & crossings, Track circuits
- f. Signal failure investigations, reports and up-keep of data
- g. Procedure in connection with opening of new works, CRS sanction.
- h. Parameters of signalling gears including TCs, points, signals, Axle counter, cable loop resistance etc.
- i. Simple Current, Voltage & Power Calculations


7. Modern Railway Signaling :

Functioning of modern signalling and their installation, maintenance and testing and troubleshooting of failure of those equipment.

- a. Electronic Interlocking - Various types used in S Rly & their salient features. Related Circuits.
- b. RDPMS, Data loggers, RTU
- c. BPAC & SSDAC, MSDAC, HASSDAC
- d. Kavach & LTE
- e. Automatic Fire Detection Alarm system
- f. Latest policy and circulars on modern railway signalling
- g. Standardised RDSO logics.
- h. SMMS

8. Stores & Accounts :

- a. Imprest stores
- b. Consumable Stores
- c. Dead Stock, T&P maintenance & DMTR
- d. Written off stores and custody
- e. Stock verification & theft of stores
- f. Preparation of various tender, work orders, non- stock indents etc.
- g. Accounts matters including material at site accounts, completion reports etc.


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9. Establishment Matters :

- a. Workman compensation Act
- b. HOER
- c. DAR major penalties & Minor Penalties.
- d. Various types of leave rules, Pass Rules and other welfare measures.

10. Official Language Policy and Rules :

- a. A, B & C regions, various incentives issued for implementation of RajBhasha.
- b. Equivalent words in Raj Basha for certain words in English.
- c. Usage of RajBhasha in official correspondence.

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JE/TELE (PQ/LDCE)

SYLLABUS FOR THE EXAMINATION FOR SELECTION TO THE POST OF JE(TELE)

The question papers for the examination will consist of following Items:

1. General Rules & Safety
2. Train Control Communication
3. Optical Fibre Communication & Quad Cable
4. Exchange
5. Data Communication & Security
6. Mobile Train Communication
7. Other Communication
8. Passenger Amenities
9. Power Supply and Lightning Protection
10. Stores, Establishment & Accounts Matters
11. Official Language- Policy and Rules

1. General Rules & Safety:

1.1. General:

- a. Organization Structure of Railways and S&T Department.
- b. Organization Structure of S&T.
- c. Must have adequate knowledge of all working rules, manuals circulars, check list and procedures including General and subsidiary Rules(Means of communication & Total interruption of communication .etc).
- d. Block working manual.
- e. Railway Accident Manual.
- f. Telecom Manual.
- g. RE practices.
- h. Schedule of Dimensions.

1.2. Safety :

- a. Passenger Safety by duly following Safe working Rules.
- b. Personal safety while working on the Railway Track, RE area, LC gates.
- c. Fire Safety-Automatic Fire Detection & Suppression System.
- d. First aid and cleanliness.
- e. Knowledge of Hand signals.

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- f. SOD for telecom.
- g. Disconnection / Reconnection.
- h. Disaster Management:
 - (i) Vital communication facilities at the accident site.
 - (ii) ART/MRV communications..
 - (iii) EMC/Portable communication.
 - (iv) Call Centre.

2. Train Control Communication:

- a. Control Communication
- b. Types of control circuits in Railways, DTMF
- c. Headquarters equipments/ Way station equipments
- d. Power supply arrangements
- e. Routine tests
- f. EMC-Portables telephones
- g. RE/Non RE/OFC controls
- h. Radio patching.
- i. Digital Voice Recorders
- j. Hot line telephone arrangement communication to LC and yards.
- k. LC gate magneto.communication
- l. Electronic Gate telephone
- m. Voice Logger for Control Communication
- n. VoIP over TCCS

3. Optical Fibre Communication & Quad Cable:

- a. Specification of cables, Types, cable construction.
- b. Cable laying procedure/Protection.Termination.
- c. Splicing.
- d. Power budgeting, Testing and measurements.
- e. Measuring instruments.
- f. OTDR Fault localization.STM 1,4,16, SDH equipment (Installation & Maintenance)
- g. PD-MUX
- h. Power supply requirement.
- i. 6 quad cable and derivation cables.
- j. Laying practices in the RE & NON RE area.
- k. Precautions.
- l. Cable Joints/Terminations.

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- m. Block working in Quad cables and OFC.
- n. Testing - Measuring instruments (Multimeter, Voltmeter, Cable Meggering equipment, Hydrometer, Earth tester).
- o. Fault localization/Restoration, Cable fault locator, Cable route tracer.

4. Exchange:

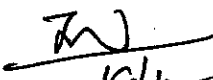
- a. ISDN Exchanges, Digital Exchanges, Mini Exchanges, Electronic Exchanges.
- b. IP Exchanges
- c. VoIP Asterisk based Exchange
- d. Planning-Installation - maintenance.
- e. Exchange U/G cable laying, terminations, Testing, Fault tracing.

5. Data Communication & Security:

- a. TCP/IP & Networking
- b. DATA modem, Routers, Hub, Firewalls, switches Statistical MUX, servers, DSL modems Basic principles of Data communicating and applications.
- c. IP-MPLS
- d. Railnet
- e. PRS, UTS.
- f. FOIS & COIS
- g. Remote V-Sat terminals.
- h. Cyber Security Arrangements.
- i. Video Surveillance System, ISS
- j. Data logger based Train Information System and networking including e-TSR, COA
- k. NMS for IP-MPLS, OFC, other data circuits.
- l. E-Mail/E-office

6. Mobile Train Communication:

- a. VHF-Walkie-talkie/Base station, Power supply/charger, Antenna, Maintenance.
- b. WPC, SACFA
- c. Long term Evolution
- d. Tower design, types of towers - Maintenance.
- e. Various types of antenna & fixtures.


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- f. Measurements - Instruments.
- g. Radio patch arrangements.
- h. UHF/VHF communication system.
- i. R.F cables, I.F cable, wave guides, Coaxial cables and connectors.
- j. Power supply with charge discharge system.

7. Other Communications:

- a. CUG phones.
- b. Video Conference System, TeleConference System, TPAAS, Biometric, Periodic Maintenance and Breakdown of TVs, Monitors, Computer System, Projectors, Smart TV, Cable TV System.
- c. Auditorium conference system-Audio & Video conference.
- d. Audio, video, and data communication arrangements for VIP functions

8. Passenger Amenities:

- a. PA System: conventional/Microprocessor based types/ PC based.
- b. IPIS - PA system, TIB, CGDB and communication on trains .
- c. WiFi, POET, Touch screen.
- d. Digital clock (GPS System).
- e. NTES and DTES.
- f. IVRS.

9. Power Supply And Lightning Protection:

- a. Charger - SMPS and other types for Tele. Applications.
- b. Stabilizers of different types.
- c. UPS, DC-DC converter & inverter.
- d. Diesel generators, installation and Maintenance.
- e. Batteries- Primary and Secondary Cells.
- f. Low Maintenance cells, Valve Regulated lead acid (VRLA) Battery, Solar panels
- g. Lithium-ion, NIMH Cells.
- h. Earthing for OFC, Quad, Exchanges and other equipment-installation, measurement, maintenance.
- i. Surge protection device (SPDS) and applications.
- j. Class A, B, C protection Practices.

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10. Stores, Establishment & Accounts Matters :

- a. Workman compensation Act
- b. HOER
- c. DAR major penalties & Minor Penalties.
- d. Various types of leave rules, Pass Rules and other welfare measures.
- e. Imprest stores
- f. Consumable Stores
- g. Dead Stock , T&P maintenance & DMTR
- h. Written of stores and custody
- i. Stock verification & theft of stores
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