South Eastern Railway

Office of the
Sr. Divl. Personnel Officer
S.E.Railway, Kharagpur

No. SER/P-KGP/EN/260/10/EN/JE(Signal)/LDCE/syllabus/25 Date:- 29.05.2025

To
The Sr. DSTE(Co-ord.)
S.E. Railway, Kharagpur

Sub: Approved uniform syllabus for the post of JE/Signal against 20% LDCE quota in S&T Department of Kharagpur Division.

Ref: PCPO/GRC's letter No. SER/P-HQ/EN/JE(Signal)/LDCE/syllabus dated 28.05.2025.

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Enclosed please find the copy of PCPO/GRC's letter cited under reference regarding syllabus for selection to the post of JE/Signal against 20% LDCE in S&T Department of Kharagpur Division.

This is for your information and wide circulation amongst all the eligible staff of this Division so as to enable all the probable candidates to prepare themselves for the forthcoming examination.

29/5/25

Assistant Personnel Officer
for Sr. Divl. Personnel Officer
S.E. Railway, Kharagpur
Date:- 29.05.2025

No. SER/P-KGP/EN/260/10/EN/JE(Signal)/LDCE

Copy to Ch. OS/IT cell/Sr. DPO Office/KGP for uploading the same in Divisional Website.

29/5/25

for Sr. Divl. Personnel Officer
S.E. Railway, Kharagpur

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दक्षिणपूर्वरेलवे / South Eastern Railway

मुख्यालय/ Headquarters:
कार्मिकविभाग / Personnel Department
गार्डेनरीच, कोलकाता –७०००४३
Garden Reach, Kolkata – 700043

NO: SER/P-HQ/EN/JE(Signal)/LDCE/Syllabus

Date: 28.05.2025

To
The Dy. CSTE/HQ
The Sr. Div. Personnel Officers
(ADA/CKP/KGP/RNC)
South Eastern Railway

Sub: Approved uniform syllabus for the post of JE/Signal against 20% LDCE quota in S&T Dept. over S.E. Railway.

In order to Standardize the Syllabus for conducting the Selection through CCBT, the syllabus as enclosed has been prepared for probable candidates of the category of JE/Signal (Level-6) against 20% LDCE quota in S&T Dept. over South Eastern Railway. This may be circulated to all concerned so as to enable all the probable candidates to prepare themselves for the forthcoming examinations.

This has the approval of the concerned HOD.

You are therefore requested for the wide circulation of the same and it is also available on the website- www.ser.indianrailways.gov.in .

Encl: - As above.

(Satyajit Roy)
Asstt. Personnel Officer (HQ)
for **Pr. Chief Personnel Officer**

Copy forwarded for information to the: -

1. Secy. to GM for kind information of GM
2. PS to PCSTE for kind information of PCSTE
3. PS to PCPO for kind information of PCPO
4. CSE/CSTE(Proj)/CPO(A)
5. Dy. CSTE(Proj)/Dy. CPO(HQ)
6. Sr. DSTEs (ADA/CKP/KGP/RNC)
7. APO(HRMS)/APO(Ruling)
8. OS/HRMS-for uploading in the Railway website

for **Pr. Chief Personnel Officer**

SOUTH EASTERN RAILWAY

SYLLABUS FOR SELECTION OF JE (SIGNAL) AGAINST 20% LDCE Quota

(1) BASICS OF SIGNAL ENGINEERING

Signalling Concepts, Fixed Signals, Aspects & Indications, Subsidiary Signals, Repeaters, Indicators, Markers & Back Lights, Overlaps, Sighting Distance & Visibility, Classification of Stations- Comparison of A,B & C, Standards of Interlocking Signals, Isolation, Simultaneous Reception and Dispatch of Trains, Systems of working (absolute, automatic etc), Operation of Points, Level Crossing Gates, Principles of Signal Engineering. Schedule of Dimension

(2) PRINCIPLES OF INTERLOCKING

Introduction to Interlocking, Essentials of Interlocking.

(3) SIGNALLING IN 25 KV AC ELECTRIFIED SECTION

Introduction to OHE system, Signal clearance and visibility, earthing arrangements, laying of Signalling cables, block instruments and block circuits, alterations to track circuits, personnel safety in 25 KV AC. Bonding plan: Series and parallel, Traction Bonds, Measurement of induced voltage and current, Glow voltage and length of parallelism, Laying of signalling cables near TRD stations and structures.

(4) POWER SUPPLY FOR SIGNALLING

Secondary Cells, Low Maintenance Lead Acid Cells, VRLA, Battery Chargers, Integrated Power Supply System, Auto-changeover, Power supply arrangement in MEDHA, ANSALDO, KYOSAN and WESTRACE EI, MSDAC power supply arrangements for CEL, ELDYNE, FRAUSHER, SIEMENS, Class B and C protection for EI and MSDAC/SSDAC/ HASSDAC etc. Power Supply Load Calculation, IPS arrangement, FUSE ratings, POWER cables copper and aluminium, Rating of components of IPS.

(5) COLOUR LIGHT & AUTOMATIC SIGNALLING

Multiple Unit Colour Light Signal, Signal Indication Circuits, Signal Aspect Control Circuit, Horizontal and Vertical Cascading, Inner Distant Signal, Automatic Colour Light Signalling, LED Signal Units, Markers: A, AG, G. P. C.R etc.

(6) RELAY INTERLOCKING (BRITISH)

Introduction to Relay Interlocking, Sequence of operation on Panel, Signalling Plan-Control Table, Nomenclature of Relays and Circuits. Introduction to RRI system, Route setting sequence, Normal Route release sequence, Emergency Route Release sequence, Super Emergency Route release sequence, Sectional route release, Track locking, Indication locking, Back locking, Dead approach locking. LC gate: Approach locking. Emergency gate release, Electrical lifting barrier, Inter cabin slotting

(7) ELECTRONIC INTERLOCKING

Introduction to Electronic interlocking, MICROLOK-II, Westrace Mark-II, Medha, KYSON, El System. Card acronyms and functions, Networking serial port RS-232, RS485, Interface with datalogger and MSDAC. Hot standby, Warm Standby and Cold standby configurations, Software and hardware redundancy, CRC and checksum, Site acceptance test and Factory acceptance tests, simulation setup board 1 and board Interface circuits, Panel processor, Dual VDU, PANEL + VDU, Emergency Crank handle release.

(8) SIGNALLING RELAYS AND CABLES

Introduction, Signalling Relays, Plug in Type DC Line Relays (Metal-Carbon contracts), Plug in Type DC Line Relays Lamp LED ECR Relays, Time Element Relays, Plug in Type Relays, Slow Acting Relays(pick up and drop), DC Polar Relay, Latch relays, Signalling Cables(color coding and cable parameters and tests), Relay name and function, characteristic.

(9) ELECTRONIC POINT MACHINE & SIGNAL MACHINE

Introduction to Power Operation of Points, IRS Rotary Electric Point Machine, Thick web point machine, Electrical point detector. Point circuit for series operation and parallel operation.

(10) BLOCK INSTRUMENTS

Introduction to different type of block instruments used for single line (TLBI) & Single line block panel & DLBI & double line block Panel, UFSBI, Detailed Circuit Description, Method of Operation and Failure rectification, BPAC (deltron, webfil) for single line and double line

(11) INTERMEDIATE BLOCK SIGNALLING

Intermediate Block Signalling, Axle Counter Block working, Block Proving Axle Counter with Block Instrument (BPAC), LVCD, IB circuit on UFSBI.

(12) TRAIN DETECTION-TRACK CIRCUITS

Introduction, D.C. Track Circuits, Insulated Rail Joints & Maintenance, Track Circuit Bonding,, Axle Counter System-Introduction, Universal Axle Counter System, Single Section Digital Axle Counter (GGTRONICS, CEL LDYNE), High availability Single Section Digital Axle Counter HASSDAC (GGTRONICS, CEL), Multi Section Digital Axle Counter MSDAC(CEL, ELDYNE, SIEMENS,FRAUSCHER), Auto reset circuits for all combination of SSDAC

(13) DATA LOGGER

Data logger Introduction, advantages of Data Logger, COMMON EQUIPMENT FOR ALL DATA LOGGERS Networking of Data Logger, RTU, FEP, Simulation, Fault logics and data validation.

(14) SURGE PROTECTION DEVICES AND LIGHTENING AND EARTHING PROTECTION

CLASS A, B&C, C protection for power supply of IPS, EL, SSDAC/MSDAC/HASSDAC and for data channels, PPTC fuses for track circuits, Maintenance free earth, Copper plate earth, Ring earth.

(15) RAJBHASA