

पूर्व मध्य रेल

कार्यालय
मंडल रेल प्रबन्धक (का0)
समस्तीपुर

सं0- का/254/राज/विद्युत/भाग-III/सम0

दिनांक :- 05.01.2024

1. वरिष्ठ मंडल विद्युत अभियंता/सामान्य/सम0
2. वरिष्ठ मंडल विद्युत अभियंता/ओपी/सम0
3. वरिष्ठ मंडल विद्युत अभियंता/टीआरडी/सम0
4. वरिष्ठ मंडल यांत्रिक अभियंता /लोको शेड/सम0
5. वरिष्ठ मंडल विद्युत अभियंता/ टीआरएस/सम0

Sub:- Selection for the post of Assistant Electrical Engineer (Group 'B') in Level-8 of Pay Matrix as per 7th PC against 70% quota as a Special drive.

Ref:- GM(P)/HJP's letter No. ECR-HQ0PERS(SEL)/38/2023 dt.04.01.2024

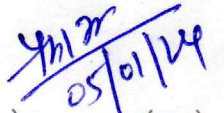
संदर्भित पत्र की छाया प्रति संलग्न कर आपके पास भेजी जा रही है, Annexure 'A' में अंकित कर्मचारियों, यदि समस्तीपुर मंडल में कार्यरत हो, का Willing/Unwilling आवेदन (Annexure 'C') प्रोफर्मा में भरवाकर दिनांक 11.01.2024 तक इस कार्यालय में भेजे जाने की व्यवस्था की जाय, ताकि समय से मुख्यालय भेजा जा सके।

संलग्नक:- यथोपरि।

(प्रकाश कुमार सिंह)
सकाधि-।

कृते मंडल रेल प्रबन्धक(का0)
समस्तीपुर

प्रतिलिपि :- मुकार्याधी/विद्युत संवर्ग - कृपया आवेदनो की जाँच कर प्रोफर्मा दिनांक 11.01.2024 को राजपत्रित संवर्ग में देवे ताकि दिनांक 15.01.2024 को मुख्यालय/हाजीपुर को सुपूर्द किया जा सके।


कृते मंडल रेल प्रबन्धक(का0)
समस्तीपुर

EAST CENTRAL RAILWAYOffice of the
General Manager(P)
Hajipur

Secy. to GM/ECR: For kind information of GM
 Dy. Secy. to AGM: For kind information of AGM
 Secy. to PCPO:- For kind information of PCPO
 SDGM/ECR/HJP, General Manager (P)/CORE/Allahabad
 General Manager/RITES/NDLS, PCEE/ECR/HJP
 CAO(Con)/S&N/MHX/ECR/PNBE, CAO/WP/PNBE, CAO/RWP/Bela
 CAO(GELF)/ECR/DMH, CPD/RE/DNR, Chairman/RRB/Patna & MFP, Chairman/RRC
 DRM/ECR/DNR, DDU, DHN, SEE & SPJ
 CWM/PD/ECR/DDU, WS/SPJ& CRW/HRT
 Sr.DPO/ECR/DNR, DDU, DHN, SEE & SPJ,
 Sr. DEEs/DEEs/ECR/DNR, DDU, DHN, SEE & SPJ
 Dy.CPO/MPP/IR&W/ECR/HJP
 Principal/ZRTI/E.C.Rly/Bhuli& MFP, Principal/STC/SPJ
 APO/Rectt./HJP, APO/M&E & APO/ESM/HQ/HJP
 All Extra Divisional Units, General Secretary/ECRKU.
 APO/MPP- For uploading on WEBSITE

Sub :- Selection for the post of Assistant Electrical Engineer (Group-'B') in Level-8 of Pay Matrix as 7th PC against 70% quota as a Special drive.

With approval of General Manager/ECR, it has been decided to hold a selection for formation of the panel of **05** persons for the post of Assistant Electrical Engineer (Group-'B') against 70% quota over E.C. Railway as a Special drive through centralized CBT by NAIR in terms of Railway Board letter No. E(GP)2022/2/4 dated 14.12.2023, as per details given below: -

Selection	UR	SC	ST	Total	PwBD (*)
AEE (Gr. 'B') 70%	04 (Four)	01 (One)	00 (Zero)	05 (Five)	01 (one)

(*) Horizontal Reservation for Locomotor Disability (LD)- One Arm (OA)/One Leg (OL), Leprosy Cured, Acid Attack victims as per Rly. Bd's L/No. E(GP)/2022/2/20 dated 18.08.2022 & 14.11.2022.

- (a) Main Examination through CBT: 25th February, 2024.
 (b) Venue & Time : will be notified in due course.
 (c) The extra round of Special examination shall be governed by the extant instructions governing promotion to Group 'B' posts. **However, there shall be no Supplementary examination for this special 70% Selection.**

2. Eligibility (As on 01.01.2023)

The list of Group 'C' employees of Electrical Department (rendered not less than 03 years of non-fortuitous service as on 01.01.2023 in scale Rs. 5000-8000, V-PC/PB-2 Rs. 9300-34800/- with Grade Pay Rs. 4200/- VI-PC/Pay Matrix Level- 6 of VII PC & above), who are eligible to appear in the 70% selection and standby list are enclosed herewith and marked as Annexure- "A" and Annexure- "B" respectively containing 19 names [15 employees as per 3X formula +03 against twice failed employees (in order of seniority)+01 SC employee upto five times of Vacancy] in the main list and 38 names in the standby list in order of seniority. Candidates are advised to be in readiness to appear for written/Main examination to be held soon through Centralized CBT. The notification may be brought to the notice of the employees concerned enlisted in Annexure 'A' and Annexure 'B'.

Contd...2..

-2-

(3) The above selection will be based on candidate's performance both in CBT/Written/Main examination, viva-voce and Record of Service. The candidates who qualify in the CBT/Written/main examination followed by medical test and found fit in the requisite medical category will only be eligible for viva-voce test. The placement of the candidates in the panel will be based on their performance in the CBT/Written/Main examination, viva-voce & Record of service as per extant instruction of Railway Board. The candidature of the candidates is accepted provisionally. In case, any candidate is subsequently found ineligible for the above selection at any stage, his/her candidature will be rejected without any further notice.

(4) The cut-off date of eligibility for candidates is **01.01.2023**.

The main & stand-by list of candidates of Electrical Department who are eligible to appear in the selection to the post of AEE(Gr.'B') against 70% quota are enclosed and marked as Annexure- 'A' and Annexure- 'B' respectively in order of seniority. Representation, if any, against the seniority position, omission/commission of any name may be sent to Dy.CPO(IR&W)/ECR/HJP through proper channel with a copy to Dy.CPO(Gaz.)/ECR/HJP within 02 days from the date of issue of this notification. No representation will be entertained after stipulated period in any circumstances.

The controlling officers should give wide publication to this notification amongst the eligible staff under their control and ensure submission of willingness/unwillingness & required details in prescribed proforma (Annexure-C) of all the eligible candidates enlisted.

The willingness/unwillingness with required details/information of all the eligible candidates enlisted in Annexure-"A" and Annexure- "B" may be sent to their controlling officer within the stipulated time. The last date for submission of willingness/unwillingness by the eligible candidates duly countersigned by their controlling officer to Dy.CPO/Gaz/ECR/HJP is **15.01.2024**.

(5) Sr. DPOs/Personnel Officers of the Divisions/Units are requested to ensure that the Staff Welfare Inspector/Sectional Staff Welfare Inspector are deputed to obtain willingness/unwillingness with required details/information on the prescribed proforma (Annexure- "C") from the candidates (including staff on deputation/leave/sick) of Annexure- 'A' & 'B' and got verified from the concerned 'P' Branch. If any candidate refuses to provide willingness/unwillingness, the deputed Staff Welfare Inspector should submit a written report regarding non-submission of option by the candidates. Such candidates will be treated as unwilling for the above selection.

Above exercise should be completed within the target date and all the relevant papers should reach to Dy.CPO(Gaz.)/ECR/HJP by **15.01.2024** positively, so that a final list of eligible willing candidates may be published.

The controlling officers are also requested to co-ordinate with the Personnel Officers and staff to complete the above exercise within time frame.

(6) **CBT/Written Examination/Main Examination:-** The examination will be conducted as per guidelines/instructions contained in Railway Board's letter No. E(GP)2018/2/31 dated 19.03.2019 (RBE No. 53/2019) &E(GP)2022/2/4 dated 07.10.2022. The CBT/Written/Main examination shall comprise of one paper which shall have 100% objective type multiple choice question only. The paper will be of 100 marks and the distribution will be as under:-

- | | |
|--|-----------|
| a) One paper on Professional Subject including optional questions of | |
| 10 marks on Official language policy & Rules:- | 70 marks |
| b) Establishment and Financial rules:- | 30 marks |
| c) Total:- | 100 marks |
| d) Qualifying marks:- | 60 marks. |
| e) Duration of examination:- | 02 Hours. |

Contd..3...

All Objective type questions will carry equal marks. There shall be negative marking for incorrect answers. One-third of the marks allotted for each question will be deducted for every wrong answer.

Since AEE is safety post, no relaxation is admissible to SC/ST candidates as per extant rules.

(7) Viva-voce & Record of service:-

	Maximum Marks	Qualifying Marks
Viva-voce	25	30 (including at least 15 marks in the Record of Service)
Record of service	25	

(8) **Syllabus:-** In terms of Rly. Bd's Letter No. E(GP)2022/2/4 dated 07.11.2022, copy of syllabus for above selection is attached as Annexure-'D'.

(9) **TRAINING OF SC/ST CANDIDATES:**

Since, there is reserved post of SC in the vacancy assessment, Pre-promotion training will be imparted to only SC candidates as per RB's letter no.E(GP)2010/2/39 dated : 28.08.2019 (RBE No.142/2019)

In terms of Railway Board's letter No. E(GP)2022/2/4 dated 18.10.2022, before conducting written/main examination, mandatory Pre-selection coaching classes of 60 hours/15 working days to all **SC eligible candidates** will be arranged by the department concerned. PCEE will nominate the JAG or above officer of Electrical department as an in-charge(s) of pre-selection coaching. The in-charge(s) will also intimate the date and venue of the pre-selection coaching in due course.

If any SC candidate refuses to undergo pre-selection coaching, a written undertaking should be obtained from him/her and the same may be sent to Dy.CPO/Gaz/ECR/HJP as well as PCEE /ECR/HJP. The controlling officers should ensure that the SC candidates under their control are spared without fail on time to participate in the coaching.

The SC candidates are also advised to insist their controlling officers, in their own interest, to spare them for the said coaching.

(9.1) **Duty of the in-charge of Pre-selection Coaching (To be nominated by the concerned PHOD):**

- (i) To inform in writing through special messenger to the eligible SC employee regarding date, time & venue of coaching.
- (ii) To obtain in writing unwillingness to attend the coaching, if any, from the eligible SC/ST employees.
- (iii) To co-ordinate and arrange sparing of the eligible candidates.
- (iv) To chalk out coaching schedule.

(9.2) **Duty of Controlling Officer:-**

To spare the candidates under their control without fail in time with the direction to participate in the pre-selection coaching as well as to appear in the written/main examination also.

(9.3) **Duty of concerned SC applicant:-**

- (i) To arrange their sparing from duty by insisting their controlling officers in their own interest.
- (ii) If any problem occurs in sparing, the candidate should report in writing to concerned in-charge of Pre-Selection coaching on the same date. No representation will be entertained in case of failure to report to the concerned in-charge of pre-selection coaching and it will deemed to be refusal for the same.
- (iii) Failure of concerned SC employees to avail pre-selection coaching on any account including leave etc. will be considered on their part and no supplementary coaching will be organized in any circumstances.
- (iv) No appeal will be entertained by GM(P)/ECR/HJP office after completion of pre-selection coaching.

After completion of pre-selection coaching, the in-charge of the pre-selection coaching will give a written report along with all supporting papers including attendance sheet of SC participants to Dy.CPO/Gaz/HJP latest by **16.02.2024** for records and further action.

- (10) Concerned Personnel Branch officer & controlling officers should ensure submission of up-dated service records and APARs of last 05 years and DAR/Vig. Clearance in respect of staff declared qualified for the viva-voce in due course/immediately after publication of the result of CBT/Written/Main examination through special messenger to SPO/Gaz/ECR/HJP.
- (11) The above selection will be held as per procedure laid down in Master Circular- 68, governing promotion from Gr. 'C' to Gr. 'B' issued by Railway Board and the instructions issued from time to time. The said master circular is available on website www.indianrailways.gov.in....>ministry of railway...>railway board> Directorate...>Establishment...>E(GP) Master Circular. The department/division/unit should ensure the compliance of instructions of Master Circular- 68 and other the instructions issued from time to time.

Please acknowledge receipt.

DA : Annexure- 'A', 'B', 'C' & 'D (Syllabus)'

Digitally Signed by Alok

Srivastava

Date: 04-01-2024 17:02:48

Reason: Approved

(Alok Srivastava)

SPO(Gaz.)

For General Manager(P)/ECR/HJP

Main list of eligible candidates for appearing in the selection of Special Drive AEE(Gr.B)against70%Quota.							
ANNEXURE "A"							
S/N	Name(S/Sri/Smt.)	Design.	Working Station	Division/ Unit	Comm.	DOB	Remarks
1	B.K.Singh	CLI (Elect.)	DHN	DHN		21.11.65	
2	RashiklalTudu	CLI	MFP	SEE	ST	20.02.68	
3	S.K.Ram	SSE/TRD	BKP	DNR	SC	17.04.71	
4	Rajesh Sinha	SSE/TRD	HJP	DHN		22.09.70	
5	S.N.P.Gupta	CLI	PNBE	DNR		08.04.64	
6	Dilip Kumar	CLI	DNR	DNR		18.01.65	
7	C.N.Kachhap	ELP(M)	DHN	DHN	ST	31.10.65	
8	YugenLepcha	LPM	DDU	DDU	ST	19.02.65	
9	Ram Ashish Mallick	CLI	GYA	DDU		01.01.66	
10	Peter Soreng	LPM	DDU	DDU	ST	12.07.64	
11	Rambalak Singh	SSE/TRD	OHE/KGG	SEE		08.02.68	
12	Teka Ram Mahto	SSE/TRD	BRKA	DHN		05.01.64	
13	Raj Narayan Singh	SSE/TRD	DHN	DHN		02.01.66	
14	S.J.Murmu	CLI (Elect.)	DHN	DHN	ST	29.01.68	
15	Uday Shankar Ojha	SSE/TRS	GMO	DHN		21.09.65	
16	R.Kachhap	ELP(M)	BRKA	DHN	ST	04.01.64	
17	Rajendra Prasad	SSE/TRS	DHN/OP	DHN		02.01.68	
18	K.M.Sharma	SSE//WS	WPO/Patna	HRT		25.01.68	
19	SubodhRajak	SSE/TRD	SEE	DHN	SC	02.09.65	
Total=19 Candidates							

Digitally Signed by Alok
Srivastava
Date: 04-01-2024 17:03:39
Reason: Approved

File No.ECR-HQ0PERS(SEL)/38/2023-O/o Dy.CPO/Gaz/HQ/ECR

Stand-by list of eligible candidates for appearing in the selection as a Special Drive AEE (Gr.B) against 70% Quota in place of Unwillingness of Staff from Main list (ANNEXURE "A")

ANNEXURE "B"

S/N	Name(S/Sri/Smt.)	Design.	Working Station	Division/Unit	Comm.	DOB	Remarks
1	W.Herenj	ELP(M)	DHN	DHN	ST	29.03.70	
2	Ashok Kumar	SSE/TRS	MS/JAJ	DNR		06.10.73	
3	Sanjay Kumar	SSE/G	RNCC/AC	DNR		20.04.72	
4	Emil Lakra	ELP(M)	DHN	DHN	ST	15.08.64	
5	Shambhu Kumar	SSE/TRD	CRP	DHN		08.01.68	
6	G.P.Kachyap	SSE/G	DDU	DDU	ST	10.08.66	
7	Heera Prasad Harijan	LPM	DDU	DDU	SC	29.02.64	
8	V.B.Pathak	CLI	DDU	DDU		01.04.64	
9	Gopal Prasad	CLI	DDU	DDU	SC	15.07.65	
10	Ramesh Kumar Srivastava	CLI	DDU	DDU		21.08.74	
11	Vishnu Yadav	CLI	DDU	DDU		15.08.65	
12	S.Z.Haque	CLI	GYA	DDU		02.09.68	
13	BishheshwarYadav	LPM	DDU	DDU		10.03.64	
14	KanhaiYadav	LPM	DDU	DDU		12.08.65	
15	SubodhTudu	SSE/TRD	DHN	DHN	ST	12.01.69	
16	R.K.Lal	CLI	DDU	DDU		26.02.67	
17	I.P.Singh	CLI	DDU	DDU		01.01.67	
18	Gautam Kumar	SSE/Gen	PNBE/EL	DNR		16.04.74	
19	BholaMurmu	LPM	DDU	DDU	ST	01.02.66	
20	Ravindra Das	CLI	SPJ	SPJ	SC	16.01.69	
21	Sanjay Kumar Singh	SSE/G	RNCC/AC	DNR		05.08.68	
22	Manoj Roy	SSE/TRD	RE/NJP	DHN		10.01.64	
23	Kaushlendra Kumar	SSE/TRD	MKA	DNR		03.07.67	
24	Prabhat Kumar	SSE/TRD	DNR	DNR		18.10.75	
25	Kumar Rajneesh	SSE/WS	CRW/HRT	HRT		16.04.75	
26	C.S.Prasad	SSE/TRD	DNR	DNR	SC	25.12.65	
27	Sanjeev Kumar Rana	SSE/TRS	GMO	DHN	SC	01.06.75	
28	A.A.Khan	SSE/TRD	DDU	DDU		04.02.65	
29	K.Ekka	ELP(M)	BRKA	DHN	ST	01.12.69	
30	Sanjay Kumar	SSE/G	RE/DNR	SEE		25.02.74	
31	M.Munda	ELP(M)	DHN	DHN	ST	05.06.67	
32	Aslam	SSE/G	DDU	DDU		22.06.64	
33	C.B.Sahu	SSE/G	GYA	DDU		18.02.64	
34	M.P.Gupta	SSE/G	DDU	DDU		01.01.66	
35	Shashidhar Prasad	CLI	DNR	DNR		05.03.66	
36	Arun Kumar Singh	CLI	DNR	DNR		03.12.65	
37	Md.Javed Alam	SSE/G	TL/DHN	DHN		15.02.65	
38	Sanjay Kumar Dubey	SSE/TRS	DHN/OP	DHN		01.01.67	

Total=38 Candidates

Digitally Signed by Alok
Srivastava
Date: 04-01-2024 17:04:20
Reason: Approved

ANNEXURE –‘C’

To,

The General Manager (P),
East Central Railway,Hajipur

Sub: Selection to the post of AEE (Gr.'B') against 70% quota (Special Drive).

Sir,

1. I.....Designation.....Station.....
.....hereby acknowledge the receipt of the above notification.
2. I am(willing/unwilling)to participate in the above selection.
3. Other details/information for Gr.'B' Selection are given below;-

Sl. No.	Particular	Filled by candidate
01	Name of applicant	
02	I.PASS Number	
03	HRMS ID	
04	Designation	
05	Mobile No.	
06	Email.ID	
07	Place of posting	
08	Division/Workshop/Unit	
09	Controlling officer	
10	DOB (DD/MM/YYYY)	
11	Community (UR/SC/ST)	
12	Whether belong to PwBD (more than 40%), if yes, chose the correct sub category as per notification	
13	Whether a PwBD requiring scribe (Yes/No)	

Your's faithfully

Signature of the candidate

Sl. No. of Annexure "A" :.....

Sl. No. of Annexure "B" :.....

Dated:

Forwarded by

Signature of the controlling officer

Designation:

Stamp:

Signature of concerned (P) Branch officer

Designation:

Stamp:

Digitally Signed by Alok

Srivastava

Date: 04-01-2024 17:05:19

Reason: Approved

Syllabus for promotion to Group- B posts - 70% selection and 30% LDCE.**Syllabus for Establishment Rules:**

1. Organization of the Personnel Department in Railways objectives functions and policies of Personnel Department.
2. Recruitment and Training, Classification of Services, Recruitment in Different services, Railway Recruitment Boards & Railway Recruitment Cells Compassionate Ground Appointments, Initial & In Service Training, Refresher Courses, Central Training Institutes, Training Centers in Zones, Divisions & Workshops, Training Modules for different posts, Training under Apprentices Act, Online Training, APARs.
3. General conditions of service in Railways, Seniority, Lien, Inter Railway & Inter Division transfers, Deputation, Promotion Policy & methods. Selection, Suitability, Trade Tests, Leave Rules, Pass Rules, Joining Time Reservation policy, HOER, Overtime, Payment of wages, current CPC Pay Rules, Advances in Railways.
4. Manpower planning, Rightsizing & Benchmarking, creation, extension and surrender of posts, creation of posts against new assets, different types of posts including workcharged posts.
5. The Railway Servants (Discipline & Appeal) Rules, 1968 and related instructions.
6. The Railway Services (Conduct) Rules, 1966 and related instructions.
7. Retirement benefits, qualifying service, pension, family pension, commutation gratuity, new pension scheme.
8. Staff welfare, SBF, Railway institutes, Railway schools, Ex-gratia payment, Incentive Bouns Scheme, Staff Grievances Redressal Mechanisms.
9. Industrial relations in Railways, recognized trade unions, industrial disputes. The Industrial Disputes Act, 1947. The Industrial Relations Code, 2020. The Trade Unions Act, 1926, PNM, PREM, JCM, Various Associations & Informal Meetings.
10. The Factories Act, 1948. The workmen's Compensation Act, 1923. Functions of Labour Enforcement Officers, Right to Information Act.
11. The scope of Information Technology in Railway e – office. HRMS, IPAS , LIMBS, ARPAN, CPGRAMS, ANUBHAV etc.

Syllabus for Financial Rules:

1. Parliamentary Control over Railway Finance, Public Accountability, Canons of Financial Propriety.
2. Railway Budget - Budgetary terms, Types of Budgets, Budget cycle, Demand of Grants, Budgetary and Financial Reviews.
3. Rules of Allocation - Classification of expenditure - Control of expenditure - Responsibility Accounting - Performance Budgeting - Exchequer Control - Financial Results of Working lines.
4. Works Programme - Financial justification of Works - Surveys - Preparation of Estimates - Capital Budget - Control over Capital Expenditure - Reappropriation of Funds.
5. Financial control over Stores Expenditure - Purchase and Stores Keeping Procedure - Inventory Control and ABC Analysis.
6. Financial & Cost Control in Railway Workshops/Sheds/Units.
7. Rules and procedure relating to Tenders and contracts for execution of works and Procurement of Stores, M&P Programme and RSP.
8. Procedure for Possessing and finalizing Audit Objections and Draft Paras.
9. Delegation of Powers.
10. Losses, Frauds and Embezzlements.
11. General Financial Rules
12. Government e-Market (GeM)
13. Classification of Railway Revenue (Earnings)
14. Information Technology in general with specific reference to Railway's IT Applications
15. Taxation matters with special focus on GST & Income Tax
16. Organization of CGA and C&AG
17. Any other topic felt necessary from time to time

Syllabus for 70% Selections for promotion to Group 'B' posts of AEE in Electrical Department.

A. Professional Subjects:

Part I: General Electrical Engg.

1. Electrical Circuits: Electrical Circuit Elements (Resistance, Inductance and capacitance), Voltage and Current Sources, Ohm's law, Kirchoff's Voltage and Current Laws, DC & AC circuit analysis.
2. Electronic Devices & Analog Electronics: Semiconductor Diodes, Diode Rectifiers, Bipolar Junction Transistor, JFET, MOSFET, Transistor Biasing Circuits.
3. Power Electronics: Characteristics and comparison of Power Diodes, BJTs, Thyristors, SCR, GTO, IGBT and Power MOSFET. One phase and Three phase uncontrolled and controlled rectifiers, Features and working of Variable Voltage Variable Frequency (VVVF) drives and its applications.
4. Electrical Engg. Materials: Properties & applications of Electrical insulating materials, Magnetic materials, Conducting materials & Semiconducting materials.
5. Electrical Machines: DC Machines, Induction Machines and Synchronous Machines. Losses in rotating machines. Single phase and three phase transformers. Losses and efficiency of transformers, Machine Drives.
6. Renewable Energy Sources: Climate change, Global warming, Various sources of Renewable energy- Resources and applications, Solar Cells, Rooftop solar and land based solar plants- Concepts of Basic Design, construction and maintenance, Off grid and Grid connected solar plants, Wind turbines, Net Zero carbon emission, ECBC, Round the clock green energy, Energy Storage systems, Policies and regulations , Net and Gross metering, Business model, tendering.
7. Power System and Protection: Basic concepts of electrical power generation and various equipment. Concepts of transmission lines, cables, Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Circuit breakers, Concept of protection.

Part II: Railways Electrical Engg.

1. General Services:

- a. Power Supply arrangement: Radial distribution system, Looped(Ring Main)
- b. distribution systems. Layout & Equipment at Distribution sub-station. Operation & Maintenance of sub-station, Various testing at sub-station, overhead & underground distribution, protective devices & their coordination. Construction, erection & commissioning of new sub-station and distribution lines. Basic features of PVC and
- c. XLPE cables. Cable rating and derating, Cable laying. Concept of average

demand, peak demand, load factor & electrical billing. Power factor improvement, Electrical & fire safety, Safety auditing of sub-station, concept of energy audit, Functions of Electrical Inspector to Government (EIG) in Railways. Power line crossing, Electricity Act-2003, CEA Regulations, SCADA and Substation automation. Earthing arrangement.

- d. Building Electrification: Types of various wiring methods, metering & safety measures. Wire, switchgears & fittings used for wiring, Energy efficient appliances, scale of fittings as per policy in various types of quarters, various types of Tariffs, commercial connection, concept of prepaid and postpaid metering, concept of smart meters. Safety coordination, Electrical accidents and prevention.
- e. Illumination & Lighting: Various parameters related to illumination, Different types of illumination sources, lighting methods, classification of lux levels at various types of stations, yard lighting & street lighting. Passenger amenities at Railway stations.
- f. Water supply: Types of water supply system, Pumping system, Classification of pumps, Comparison of various pumps, fluid theory, discharge calculations. Centrifugal pump, turbine pump, Submersible pumps, characteristic curve of pumps, efficiency. Cavitations & priming of pumps, necessity of multistage pumping, storage capacity and purification of water. Installation, maintenance & troubleshooting of pumps, Starter & drives of pumps, automation of pumps.
- g. Lift & Escalator: Working of Lift & Escalator, Installation of Lift and Escalator. Maintenance, various safety devices, control panels & Safety aspects.
- h. Air Conditioning & Refrigeration: Theory of air conditioning, refrigeration cycles, various types of refrigerants, window/split/package AC unit. Central air conditioning plant, VRF system, air cooling systems, planning for capacity and drives for refrigeration plant, Maintenance and troubleshooting.
- i. Energy Conservation: Need of conservation of energy, Various measures being taken by railways to conserve energy in the field of Electrical General Services. Necessity and implementation of Open Access in Indian Railways. Energy conservation Act.

2. Traction distribution:

- a. OHE: Basic design concepts of TRD system of conventional and 2x25kV system. Types of overhead equipment. Sectioning principles of OHE. Various parts of OHE. Foot Patrolling, current collection, Tower wagons, seasonal & cyclic checks, maintenance Schedule, Preventive maintenance Tools, failure investigation of OHE, earthing and bonding. Railway Electrification and process of construction. Power Blocks & Procedure to obtain it.
- b. PSI: Schematics of 1x25kV and 2x25kV traction substation with names/ratings of various equipment, protection scheme for TSS. Fixed and dynamic PF correction, Feeding stations, SSP & SPs, 132 kV transmission lines, PSI equipment.

Maintenance and failure investigation of PSI equipment.

- c. SCADA and Miscellaneous items: Operation and maintenance of remote control, traction power control organization, permit to work, emergency arrangements, coordination with operating and other departments. Liaison with supply authorities, maintenance and failure investigation of SCADA equipment.
- d. NDT techniques, Open Access, safety precautions for electrified sections, Latest development in TRD, MSG meetings. Instructions issued by Railway Board, RDSO's TI/MI, TCs, IRSOD & ACTM.

3. Train Lighting and AC Coaches:

Systems of Train Lighting and Air conditioning on 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, Heat Load Calculation, Precooling, Pulldown and Dynodrive tests. Maintenance schedules of ICF and LHB coaches. Duties of ACCM/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.

4. Electric Locos:

Organizational structure and duties of officers & staff. Conventional AC & 3 phase locomotives on IR. Equipment in locomotives, their functioning / operations, maintenance / overhauling and testing parameters & maintenance schedules. Reliability & safety action plans. Traction Power Circuit, Auxiliary Circuit, Control Circuits and Pneumatic Circuits. Different types of braking arrangements. Locomotive maintenance schedules & various tests to be carried out. Working of Electric Loco Shed & Electric Loco Workshop. Safety items and safety checks involved in safe locomotive operation. Relevant paras of ACTM, Accident Manual, G&SR, IR SOD and Instructions issued by Railway Board, RDSO and CLW. Latest developments in the field of electric locomotives.

5. EMU and MEMU/Metros:

Concept of EMU/MEMU/Metro trains, various types of EMU/MEMU stock, Conventional & 3 phase EMUs & their salient features. Different types of brakes used in EMU/MEMU/Metros. Power circuits, auxiliary, control circuits. Mechanical components and its functions. Different electrical equipment and its functions. Inspection/Maintenance/Overhauling schedules of EMUs/MEMU/Metros. Safety precautions and fire prevention in EMU/MEMU/Metros. Train Control Management System(TCMS). Recent developments in EMU/MEMU/Metros.

6. Electric Loco and EMU Operation:

Organizational structure and duties of officers & staff. Crew management – Training, Monitoring & Counseling. Crew & loco links. HOER & Duty Rules. Loco utilization. SPAD (Signal Passing At Danger). Management of Crew lobby, running room, trips shed & TLC / Power controller office. Working of CMS & FOIS. Safe, punctual & efficient loco / EMU operation with online troubleshooting of locomotive / EMU failures. Relevant paras of ACTM, Accident Manual, G&SR, Instructions issued by Railway Board & RDSO. Latest developments in the field of electric locomotives / EMU operations.

7. Store Matters:

Procedure related to procurement of stock items and non-stock items, distribution and accountal of stores. Receipt and custody of stores. Sale of surplus stores. Inventory management, ABC Analysis. Procurement through GeM, IREPS. Schedule of powers under stores matters.

8. Tenders and Contracts:

Work proposals, Types of estimates & estimation stages. Type of tenders, earnest money, Performance guarantee, security deposit, technical & financial eligibility criteria, Merits and demerits of EPC tender. IRPMS. Procedure and stages of e-tendering through IREPS, General Condition of Contract (GCC) for works and service contracts, various provisions in Schedule of Power (SOP) under works matters, Basic principles of Project management, quality control in electrical works.