EAST CENTRAL RAILWAY

Office of the
General Manager (P)
Hajipur

No. ECR-HQ0PERS(SEL)38/2023 dated : 18.11.2024

Secy. to GM/ECR: For kind information of GM/ECR
Secy. to AGM: For kind information of AGM/ECR
Secy. to PCPO/ECR/HJP :- for kind information of PCPO/ECR
SDGM/ECR/HJP, General Manager (P)/CORE/Allahabad
General Manager/RITES/NDLS, PCEE/ECR/HJP, PCSC/ECR/HJP
CAO(Con)/North & South/MHX/ECR/PNBE, CAO/WP/PNBE,
CAO/RWP/Bela, CAO(GELF)/ECR/DNR & Patna, CPD/RE/DNR DG/RDSO,
All PSUs, All DRMs/ECR All Sr.DPOs/ECR, All Sr. DEEs/DEEs/ECR
Chairman/RRB/Patna & MFP, SPO/Cons/MHX, SPO/RE/DNR
CWM/PD/ECR/DDU, WS/SPJ & CRW/HRT
Dy.CPO/IR&W/ECR/HJP, SPO/PD/DDU, APO/CRW/HRT
Principal/ZRTI/E.C.Rly/Bhuli& MFP, All Extra Divisional Unit
General Secretary/ECRKU, APO/IR&W & APO/MPP/ECR/HJP : for uploading on website.
All Extra Divisioanl Units. General Secretary/ECROA, ECRPOA & ECRKU.

Sub :- Selection for the post of Assistant Electrical Engineer (Group'B') in Level-8 of Pay Matrix, (Pay Band Rs. 9300-34800/- (PB-2) Grade Pay –4800/- as per 6th CPC) against 70% quota.

Ref :- (i) Railway Board's letter No. E(GP)2024/2/28 dated : 27.09.2024 & 08.10.2024.
(ii) Railway Board's letter No. E(GP)2024/2/37 dated : 06.11.2024

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With approval of General Manager/ECR, it has been decided to hold a selection for formation of the panel against **15** vacancies for the post of **Assistant Electrical Engineer** (Group 'B'**) against 70% quota** over E.C. Railway, through centralized CBT by NAIR in terms of Railway Board letter No. E(GP)2024/2/28 dated : 27.09.2024, as per details given below : -

Selection	UR	SC	ST	Total	PwBD (*)
AEE (Gr."B")/70%	10	4	1	15	1

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

Note # Successful PwBD candidates in the written test (CBT) will be subject to medical examination in safety category by the Railway medical authority prior to viva-voce.

1. (a) Written Examination through CBT :- 09 March, 2025 (Tentative)
(b) Venue, Time & Viva-voce :- will be notified in due course.

2. Eligibility (As on 01.01.2025)

(i) All Permanent Group 'C' Technical & Running staff/employees (Non ministerial staff) of Electrical Department working/holding lien in Electrical Department of East Central Railway, who have rendered not less than 03 years non-fortuitous service in Level-6 of Pay Matrix (Pay Band of Rs. 9300-34800/-(PB-2) Grade Pay-Rs.4200/- as per 6th CPC) and above including Shunter-II of Electrical Department/E.C.Railway working in Pay Band Rs. 5200-20200/- (PB-1) Grade Pay Rs. 2400/- (equivalent to the stationary post in Pay Band Rs. 9300-34800/-(PB-2) Grade Pay-Rs.4200/- & above as per RBE No. 92/2015 dated : 18.08.2015) as on 01.01.2025, are eligible to apply for the above mentioned selection.

Cont. at P-2……

NB :- However, those Gr."C" employees who have been provided G.P. Rs. 4200/- or above in PB (9300-34800) under ACP/MACP are not eligible to volunteer for the above written examination.

(ii) As per Railway Board's letter No. E(GP)/2005/2/74 dated : 13.03.2008 (RBE No.40/2008), in case of person transferred at own request to this Railway in the same category of posts, and assigned bottom seniority therein, the service rendered by them in the previous unit may be reckoned for determining their eligibility, wherever a minimum length of service is prescribed as a condition for promotion in the new unit, subject to the condition that the length of service which is so allowed to be counted does not exceed the length of service of their immediate senior in the new unit.

(iii) In terms of Railway Board's letter No.E(GP)2024/2/28 dated : 08.10.2024, it has been decided by the Board that henceforth, in respect of 70% selections to Group "B" posts, all employees who are eligible and who volunteer for the selection, should be considered without any limitation of number. Hence, the employees who are fulfilling the eligibility criteria for the post may submit their application.

(iv) All the volunteer who fulfill the above mentioned conditions of eligibility will get chance to compete in the above examination, without any restrictions to the number of eligible candidates to be allowed for appearing the examination.

(v) In terms of Railway Board's letter No. E(GP)2024/2/09 dated : 14.10.2024, an employee who has been medically de-categorized should have rendered the requisite eligibility service in the relevant grade (s) after absorption in the alternate post for being eligible for promotion to Group "B" posts. These instructions pertain only to reckoning eligibility for promotion to Group "B" Posts.

(vi) As advised in RBE No. 102/2019 dated : 25.06.2019, the time spent by railway servant under training immediately before appointment to service is to be counted as service is to be counted as service for the purpose of appearing in Departmental Examination including LDCE for promotion to Group "B".

(vii) The volunteers who have completed 3 years of Non-fortuitous service in the current seniority unit of the cadre as on 01.01.2025 are only eligible to apply. The same may be verified and ensured by the Personnel Officer/Establishment officer concerned while forwarding the applications.

(Viii) If any candidate is subsequently found ineligible for the above selection, at any stage, his/her candidature will be rejected.

(ix) Eligible staff who desire to volunteer for the above 70% Selection may submit their application through proper channel to their respective Personnel Branch officer.

(x) Eligible staff working in the Construction/Project Organization on deputation, training and any Ex-cadre Organization and having lien and seniority in ECR, who desire to volunteer for the above 70% Selection may also submit their application through proper channel i.e. their respective Personnel Branch officer, where they hold lien. The concerned Divisions/Units should send copy of notice to the staff who are on deputation after being released from that Divisions/Units.

Cont. at P-3……

(xi) When an employee is holding an ex-cadre post, details of his/her post in regular cadre with the grade and date of entry as a regular measure should be furnished. This may also be brought to the notice of all concerned. It may be ensured that wide publicity is given to this notification amongst all the eligible staff. It is the personal responsibility of the personnel Officers/Controlling Officers of the Units to ensure that the notification reaches to all the eligible employee well in time.

The cut-off date of eligibility for candidates for 70% selection is 01.01.2025.

(3) Normally, there is no provision for holding absentee written examination. However, in exceptional circumstances, where sufficient and satisfactory reason/proof beyond control of candidates are available, (viz either the candidate under RMC or he was not spared by his controlling officer due to administrative reasons), only such candidates may be allowed to appear in absentee written examination with approval of the Competent Authority. It will be responsibility of the candidate to advice reasons of absence through controlling officer to Dy.CPO(Gaz)/E.C.Railway/Hajipur within 03 days from the date of CBT by NAIR.

In case of failure to comply the above instructions by the candidate, he/she will not be allowed to appear in the absentee written examination, if held.

(4) The above selection will be based on the candidate's performance both in CBT Examination, Record of Service as well as viva-voce. The candidates, who qualify in the CBT Examination followed by medical test of specified 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 Examination, Viva-voce & Record of service as per extant procedure of Railway Board's instruction.

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.

(5) CBT/Written Examination :-

The CBT/Written 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 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:-

(i)	One paper on Professional Subject including optional questions of 10 marks on Official language policy & Rules	:-	70 marks
(ii)	Establishment and Financial rules	:-	30 marks
	Total	:-	100 marks
(iii)	Qualifying marks	:-	60 marks.
(iv)	Duration of examination	:-	02 Hours.

All Objective type questions will carry equal marks. In terms of Railway Board's letter No. E(GP)/2024/2/28 dated : 08.10.2024 (RBE No. 93/2024 dated : 08.10.2024) there shall be no negative marking in written examinations held as part of Selections (70%) where the final panels are made on seniority basis.

Cont. at P-4……

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

(6) 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	

(7) Syllabus :- The syllabus as prescribed by Railway Board vide letter No. E(GP)2022/2/4 dated 07.11.2022 for 70% selection for Group 'B' post of AEE in Electrical Department, copy of syllabus for above selection is attached as **Annexure-'C'.**

(8) The controlling Officers should give wide publicity of this notification amongst the eligible staff/employees under their control and ensure submission of applications by the candidates in the prescribed Proforma (specimen copy enclosed as **Annexure-'A'**) within the stipulated time mentioned below.

The last date for submission of the application by candidates duly countersigned by their controlling officer to the concerned Personnel Branch officer is 02.12.2024. ***The filled-up applications should be scrutinized properly by associate Personnel Branch with the service records to avoid any factual errors and future complications. The applications should also be signed by the Controlling Officer with official seal and should have the counter signature of the concerned 'P' Branch Officer. All the applications received by the Personnel Branch Officers through controlling officers should be sent in a bunch so as to reach Dy. CPO/Gaz./ECR/Hajipur, on or before*** *09.12.2024* ***positively.*** Applications forwarded after the last date will not be entertained under any circumstances. It may please be noted that application other than in prescribed Performa or without signature of controlling officer and checked & counter signature of Personnel Branch Officer will not be entertained.

(9) In case, service particulars furnished by the volunteers/certified to be in order by the concerned authority are found incorrect/false subsequently, the candidature of the volunteers will be liable to cancelled at any stage during & even after the above selection process.

(10) TRAINING OF SC/ST CANDIDATES:-

Since, there is reserved post of SC/ST in the vacancy assessment, Pre-promotion training will be imparted to only SC/ST 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 CBT/Written examination, mandatory Pre-selection coaching classes of **60 hours/15 working days** to all SC/ST 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. Date & Venue will be notified later with the final list of the SC /ST candidates.

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/ST candidates under their control are spared without fail on time to participate in the coaching.

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

Cont. at P-5……

(10.1) Duty of the in-charge of Pre-selection Coaching (To be nominated by PCEE):

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

(10.2) 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 examination also.

(10.3) Duty of concerned SC/ST 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/ST 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/ST participants to Dy.CPO/Gaz/HJP within three days of completion of said training.

(11) The Controlling/Authorized officer should ensure to issue individual sparing letter/identity slip duly attesting specimen signature of the candidate on the sparing letter/identity slip with direction to attend the CBT/Written/Main examination (date will be advised in due course). The candidates without proper sparing letter/identity slip will not be allowed to appear in the examination.

(12) ACTION TO BE TAKEN ON RECEIPT OF APPLICATION BY CONCERNED PERSONNEL OFFICERS/CADRE CONTROLLING OFFICERS :-

(a) The Personnel Officer/Cadre Controlling Officer will check the correctness of all the particulars of the applications with the Service Records and other relevant records and certify the correctness of each column of the application. Without such certification, application received will summarily be rejected and the responsibility will be fixed for incorrect or incomplete certification against the Officer who will certify/verify. The Personnel Officer/Cadre Controlling Officer should invariably write "Checked and verified" in each and every application after checking and verifying the details duly attesting their signature and date of certification (the date of certification should invariably put in the application).

In case, the Personnel/Cadre Controlling Officers do not put the date after certification or merely forward the application without checking and verifying the details, the matter would be brought to the notice of **PCPO and concerned PHOD** for taking action against him.

(b) It may please be noted that Controlling Officers/heads of the Units have no discretion to entertain any application beyond the last date.

Cont. at P-6……

(c) ***The applications of the employees, who are eligible, should only be forwarded after verifying the other relevant particulars and ineligible application should not be forwarded.***

(d) The Personnel Officer/Cadre Controlling Officer should forward the scrutinized and checked applications in one bunch together under one covering letter furnishing the details in the following proforma addressed to Dy. CPO/Gaz./HQ by **09.12.2024** indicating therein the total number of applications forwarded. (The details should be sent in soft copy in (MS/Excel format also as in the performa as **Annexure "B"**). The applications rejected may be intimated to the individuals giving reasons thereof by the concerned staff held.

(13) 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.

Please acknowledge receipt.

DA : (i) Proforma (Annexure-'A')
(ii) Proforma (Annexure-'B')
(iii) RB' letter No. E(GP)2022/2/4 dated : 07.11.2022 (Syllsbus)/ (Annexure-'C')

Signed by
Ajeet Kumar
Date: 18-11-2024 17:48:18
(Ajeet Kumar)
APO(Gaz.)
For General Manager(P)/HJP

Annexure 'A'

PROFORMA OF APPLICATION AGAINST NOTIFICATION FOR THE SELECTION OF POST OF AEE/(Gr.'B') 70% QUOTA.

(It is mandatory to fill each and every column with correct information.)

(Ref. : ECR-HQ0PERS(SEL)38/2023 dated : 18.11.2024)

1. Information regarding candidate:

Sl. No.	Particular	Filled by candidates
1	Name of applicant (In Block letter)	
2	IPASS Number (11 digits)	
3	HRMS ID	
4	Designation	
5	Mobile No. (Registered with HRMS ID)	
6	Email.ID	
7	Place of posting	
8	Division/Workshop/Unit	
9	Division/Unit where **lien held at**	
10	Working under (Controlling Officer)	
11	Educational Qualification	
12	DOB (DD/MM/YYYY)	
13	Community (UR/SC/ST) (if SC/ST, a copy of caste/Tribe Certificate duly attested by a Gazetted officer should be enclosed with application	
14	(i) Date of initial appointment in Railway Service	
	(ii) Designation at the time of initial appointment	
	(iii) G.P/level at the time of initial appointment	
15	Date of Appointment (DD/MM/YYYY) (Regular appointment date after training, where mandatory training is envolved)	
16	Belongs to PwBD (40% or more), if yes mention category and attach certificate.	
17	If a PwBD, whether entitled to Scribe (Yes/No)	
18	To be filled up by those employees only, who were transferred to present division on Own request/Mutual transfer.	
19	Whether came in present unit on own request transfer basis or Mutual transfer basis ? (mention 'Yes' or 'No')	Own request transfer :-
		Mutual transfer :-
20	If, came in present unit on own request basis or Mutual transfer basis, following details must be mentioned :-	
	Transferred From	Transferred To
	Division/Railway	Division/Railway
	Designation	Designation
	Pay Level	Pay Level
		Joining date in present Railway/ Division
	Effective date of Seniority – In level-6	Date :
	Effective date of Seniority – In level-7	Date :
21	To be filled up by those employees only, who were On deputation.	
	(a) Are you on Deputation (Yes/No)	(b) Parent Unit :-
	(c) Substantive Designation and Pay Level in your parent unit :-	(d) Officiating Designation and Pay Level :-

2. Date of appointment/promotion (on regular basis) and Length of non-fortuitous service (on regular basis) as on 01.01.2025.

Grade	Date of appointment/ promotion (on regular basis) [in DD/MM/YYYY]	Length of non-fortuitous service (on regular basis)			
		As on	Year(s)	Month(s)	Day(s)
(a) In PB-I GP- 2400 (For Loco Pilot Shunter-II Only)					
(b) In PB-II GP-4200					
(c) In PB-II GP-4600					

3. Present pay & level (GP) & Date of promotion to present Scale/grade. :-

4. DECLARATION OF THE CANDIDATE:-I do hereby declare that the above particulars furnished by me are true to the best of my knowledge and belief. I further undertake that in the event of any entry above is found incorrect or improper, my candidature shall liable to be cancelled at any stage during pendency of the above selection and disciplinary action may be taken against me under the RS(D&A) rules-1968.

SIGNATURE OF THE CANDIDATE (in HINDI) SIGNATURE OF THE CANDIDATE (in ENGLISH)

(A)Forwarding of application (filled-up) furnished by the candidate to the Personnel Branch Officer by his/her controlling officer:-

The application is in prescribed proforma duly filled-up by the candidate,Shri/Smt._____ Designation_____ received within the target date is hereby forwarded to his/her Personnel Branch Officer for verification with the service record available and for onward transmission to the General Manager (P)/ECR/HJP.

SIGNATURE OF CONTROLLING OFFICER (With office seal & date)

(B)Certificate to be furnished by the Personnel Branch Officer :-

If the volunteer comes under the circumstances mentioned in Para **2(ii)** of the notification the service rendered by **immediate senior employee as on 01.01.2025** should be indicated invariably in the following format.

Sl. No.	Name(S/Shri) of immediate senior	Designation	Pay level (GP)	Year(s)	Month(s)	Day(s)
			In PB-I GP- 2400 (For Loco Pilot Shunter- II Only)			
			In PB-II GP 4200			
			In PB-II GP 4600			

It is certify that the Service Particulars/Bio-Data furnished by Shri/Smt. ……., Designation …… in the prescribed proforma (Bio-data) have been checked and verified with his/her service record and found correct.

The above mentioned candidate is eligible to appear in the said selection as per Notification and his/her application is hereby forwarded to GM (P)/Hajipur for further necessary action.

SIGNATURE OF THE CADRE ('P' BRANCH) OFFICER (With office seal & date)

Note:- The application with any column unfilled will be summarily rejected

Centralized CBT for Gr. 'B' selection against 70% for the vacancy cycle 2025-26															Annexure-"B"			
Particulars of eligible applicants																		
SN	Post Name	**Name of the applicant (S/Shri)**	**I-passNo.**	**HRMS ID**	**Design.**	**Mobile No.**	**Email ID**	**Place of Posting**	**Div./ workshop/ Unit**	**Controlling Officer**	**Date of Birth (DD/MM/ YYYY**	**Date of Apptt.**	**Date of Promotion in Level-6**	**Date of Promotion in Level-7**	**Commu -nity (UR/SC /ST)**	**PwBD or Not (Yes/No)**	**PwBD Categ ory, if any**	**Whether a PwBD requiring scribe**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	AEE																	
2	AEE																	
3	AEE																	
4	AEE																	
5	AEE																	
6	AEE																	
7	AEE																	
8	AEE																	
9	AEE																	
10	AEE																	

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, Cannons 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 *Wo*rkshops/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.