

EAST CENTRAL RAILWAY

NOTIFICATION

Office of the
General Manager (P)
Hajipur

Dated: 23.10.2018

No. ECR/HRD/GAZ/254/AEE (Gr.B)/30%/2018
Secy. to GM- for kind information of GM,
PS-I to AGM – for kind information of AGM.
PS-I to PCPO- for kind information of PCPO,
General Manager (P) CORE/Allahabad,
CAO/Con/South & North/MHX,
PCEE/ECR/HJP, SDGM/ECR/HJP, PFA/ECR/HJP,
CAO/WP/Patna, CAO/GELF/DMH, CAO/DLF/MEW.
DRM/ECR-DNR, MGS, DHN, SEE & SPJ
Dy.CPO/HRD/ECR/HJP, Dy.GM(Law)/MHX/Patna.
CPD/RE/DNR.
Sr. DEEs/DEEs/ECR-DNR, MGS, DHN, SEE & SPJ.
Sr.DPO/ECR/ DNR, MGS, DHN, SEE & SPJ.
CWM/PD/ECR/MGS, WS/SPJ & CRW/HRT
Chairman RRB/Patna & MFP. Chairman/RRC/Dighaghat/Patna.
Principal/ZRTI/E.C.Rly/Bhuli & MFP
SPO/Con(IC)/MHX/Patna
SPO(MPP)/ECR/HJP- for uploading on NET.
All Extra Divisional Units.
General Secretary/ECRKU

Sub:- Limited Departmental Competitive Examination (LDCE) for the post of AEE
(Group-'B') in Pay Band Rs. 9300-34800/- (PB-2) Grade Pay Rs.4800/-(6th
CPC)/Level-8 as per 7th CPC against 30% quota.

With the approval of General Manager, It has been decided to hold a LDCE for forming a
panel against 04 vacancies (UR- 03, SC- 01 & ST- Nil) for the post of Assistant Electrical Engineer
(Group-'B', 30% quota) for E.C. Railway. The details are given below:-

(1) TENTATIVE PROGRAMME OF WRITTEN EXAMINATION & VIVA-VOCE:

Will be notified in due course.

(2) ELIGIBILITY (As on 13.10.2016):

- (a) All permanent Group-'C' Technical staff working in the Electrical Department in Pay Band 9300-34800 (PB-2) and Grade pay 4200 (Level- 6 in 7th CPC) & above including all running staff of Electrical Department 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) including those working over E.C.Railway and in other Railways/on deputation having lien and seniority on East Central Railway who have completed minimum 5 years non-fortuitous service in the grade(s) (in GP- 4200/- as per 6th CPC) as on 13.10.2016 are eligible to volunteer for the LDCE.
- (b) However, those Gr. 'C' employees who have been provided grade pay 4200/- in PB-2 as per 6th CPC (Rs. 9300-34800) under ACP/MACP are not eligible to volunteer for the above written examination.

The cut-off date of eligibility for candidates for 30% LDCE is 13.10.2016, which is same as the earlier part selection of 70% quota.

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- (c) As per Railway Board's letter No. E(GP)2005/2/74 dated 13.03.2008(RBE 40/2008), in case of persons transferred on own request to a new unit in the same category of posts, and assigned bottom seniority therein, the service rendered such employees 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.
- (d) Candidate who has come on own request transfer/mutual transfer from other Railway and joined to this Railway after cutoff date i.e 13.10.2016 will not be eligible to appear in the selection.
- (3) Eligible staff who desire to volunteer for the above LDCE may submit their application through proper channel to their respective Personnel Branch Office where they hold lien.
- (4) All the volunteers who fulfill the above-mentioned conditions of eligibility will get the chance to compete in the said LDCE, without any restrictions to the number of eligible candidates to be allowed for appearing in the examination.
- (5) The above selection will be based on the candidate's performance in Written Examination, Viva-voce test and Records of Service. Only the candidates, who qualify in the written examination, and found medically fit for Safety Category of AEE (Gr.'B') as prescribed in Indian Railway Medical Manual will only be called for Viva-voce test. The placement of the candidates in the panel will be based on their performance in Written Exam./Viva-voce Test/Record of Service as per extant instruction of Railway Board.
- (6) Syllabus:
- (I) The written examination for selection to the post of AEE (Gr.'B') 30% will consist of two papers with maximum marks of 150 and qualifying marks of 90 in each paper. Out of 150 marks, professional subject will carry 100 marks. In terms of Railway Board's letter No. Hindi-2010/OL-1/10/4dt 14.12.2016, question(s) worth 15 marks out of a total of 150 marks in paper-1 will be on the subject of official language policy and rules, which will not be compulsory to attempt.

- (II) The written examination will consist of TWO PAPERS on the subject, total marks & qualifying marks are indicated below: -

SUBJECT	MAXIMUM MARKS	QUALIFYING MARKS	DURATION OF EXAM
PAPER - I Professional subject, General Knowledge &/ on Rajbhasha.	150	90	03 Hours
PAPER - II Professional subject, Establishment & Financial Rules.	150	90	03 Hours

(III) Head

	Maximum Marks
Record of service - 25	
Viva-voce Test-25	→ 50

Minimum-Qualifying marks

30
(With at least 15 marks of Record of Service)

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- (7) The question paper will be bi-lingual, i.e. both in Hindi and English. It will be the candidate's choice to write in any one of these languages. The candidate should clearly indicate his/her choice of language in the space of the application format.
- (8) The question paper for the written test should have a practical basis i.e. it should be designed to test the ability of candidates to tackle the practical problems they are likely to face rather than their theoretical knowledge. Syllabus for the LDCE is enclosed as Annexure-B.
- (9) The Controlling Officers should give wide publicity of this Notification amongst the eligible employees under their control and ensure submission of applications given by the candidates in the prescribed Proforma (Specimen copy enclosed as Annexure-A) within the stipulated time as mentioned below:-

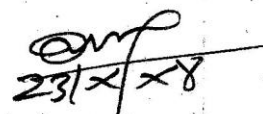
The last date for submission of application by candidates duly countersigned by their controlling officer to the concerned Personnel Branch is 22.11.2018. The filled-up applications should be scrutinized properly by associated Personnel Branch verifying the details from the Service Record to avoid any 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 Controlling Officer/Personnel Branch Officer through Controlling Officers should be sent in the bunch so as to reach to PS-II to Dy.CPO/Gaz./ECR/HJP, on or before 30.11.2018 positively. Applications forwarded after 30.11.2018 will not be entertained. It may please be noted that application other than in prescribed Proforma, having incomplete information or without signature of Controlling Officer and countersigned by Personnel Branch Officer will not be entertained.

- (10) A copy of syllabus relating to Professional Subject and Financial Rule is enclosed as Annexure-'B' for wide circulation amongst the eligible candidates.
- (11) In case the service particulars furnished by the volunteers and certified to be in order by the concerned authorities are found incorrect/false subsequently, the candidature of such volunteer will be cancelled at any stage and suitable departmental action will be initiated against him/her.
- (12) **ACTION TO BE TAKEN ON RECEIPT OF APPLICATION BY CONCERNED PERSONNEL OFFICERS/CADRE CONTROLLING OFFICER:-**

- 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 item of the application. Without such certification, applications will summarily be rejected and the responsibility will be fixed for incorrect or incomplete certification against the officer who certifies the same. The Personnel Officer/Cadre Controlling Officer should invariably write "Checked and Verified" in each and every application after checking and verifying the details with signature and date of certification (the date of certification should invariably put in the application).

In case, the Personnel/Cadre Controlling Officer 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.

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



- c) 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./HJP by 30.11.2018 indication therein the total number of applications forwarded, The details should be sent in soft copy in MS Excel format also. The applications rejected may be intimated to the individual employees giving reasons thereof.

Proforma:

1	2	3	4	5	6	7	8			9		
Sl No	Name of the employee	Desi g.	DO B	DO* A	Worki ng Under	Communi ty UR/SC/ ST	Date of Regular joining/promot ion to Grade Pay			Total Service in (GP) Rs.4200/- & above in Electrical Deptt as on 13.10.2016		
							GP 24 00	GP 42 00	GP 46 00	Yea r (s)	Mont h(s)	Day (s)

(13) TRAINING OF SC/ST CANDIDATES:

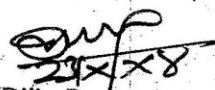
In terms of Railway Board's letter No. E (MPP) 96/3/23 dt. 21.07.2000, SC/ST candidates are required to undergo training for 3-4 weeks (21 working days) Date for training & venue will be notified later with the final list of the SC/ST candidates.

- (14) As per rule, there is no provision of absentee exam in LDCE. The eligible employees should also be advised that no supplementary written examination will be held for the absentees under any circumstance.
- (15) The instructions and Master Circulars 68 governing promotion from Gr.C to Gr.B have been issued by Railway Board. The said master circular is available on website www.indianrailways.gov.in Railway Board Directorate Establishment E (GP) Master Circular. The Department/Division/Unit should ensure the compliance of instruction of item no. 15 of Master Circular 68.

Please acknowledge receipt.

Hindi Version will follow.

DA:- (i) Annexure 'A',
(ii) Annexure 'B'


(Dilip Paswan)
SPO/Gaz.
For General Manager (P)

Annexure 'A'

PROFORMA OF APPLICATION AGAINST NOTIFICATION NO. ECR/HRD/GAZ/254/AEE/Gr.'B'/30%/2018 Dated: 23.10.2018. FOR AEE (Gr.'B') LDCE 30% QUOTA.

1. Name in Full (Block Letters)
2. Designation and station
3. Working under
4. Divn/Unit where lien held
5. PF No./NPS No.
6. Educational Qualification
7. Date of Birth
8. Date of appointment to Railway service
9. Whether the candidate belongs to SC/ST Community (if yes, a copy of caste/Tribe Certificate duly attested by a Gazetted Officer should be enclosed with application.)

10. Date of appointment/promotion to the following grade on regular basis (6th PC):-

	Day	Month	Year
(a) In PB-I GP- 2400 (for running staff only)			
(b) In PB-II GP-4200			
(c) In PB-II GP-4600			

11. Length of non-fortuitous service (Regular Promotion) to the following grade as on 13.10.2016.

	As on	Year(s)	Month(s)	Day(s)
(a) In PB-I GP- 2400 (for running staff only)	13.10.2016			
(b) In PB-II GP-4200				
(c) In PB-II GP-4600				

12. Present pay & scale & Date of promotion to present scale. :-
13. Choice of language to answer the questions (English/Hindi). The candidate should indicate his/her choice, either any one of the above two language.

14. 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 not in order, my candidature shall liable to be cancelled at any stage during pendency of the above selection.

SIGNATURE OF THE CANDIDATE (HINDI)

SIGNATURE OF THE CANDIDATE (ENGLISH)

(A)

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

The application is 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 (c) of the notification the service rendered by immediate senior employee as on 13.10.2016 should be indicated invariably in the following format.

Sl.No.	Name(S/Shri) of immediate senior	Designation	Pay Band & GP	Year	Month	Day
			In PB-I GP 2400 (for running staff 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 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 applications are 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

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Syllabus for professional papers (Revised) for 30% LDCE for promotion to Group B post of AEE in Electrical Engineering Department

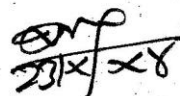
Paper-I

Maximum Marks: 150	Qualifying Marks: 90
General	Part-I
I. General Knowledge	50 Marks
II. Official language	
	Part-II
Professional Subject	100 marks

1.0	General-
1.1	Net work analysis, Star/Delta, transformation Symmetrical component, transients, Basics of Control Systems.
1.2	<p>Analog and Digital Electronics and Circuits: Semiconductor device physics, PN junctions and transistors, circuit models and parameters, FET, Zener, tunnel, Schottky, photo diodes and their applications, rectifier circuits, voltage regulators and multipliers, switching behaviour of diodes and transistors.</p> <p>Small signal amplifiers, biasing circuits, frequency response and improvement, multi-stage amplifiers and feed-back amplifiers, D.C. amplifiers, Oscillators. Large signal amplifiers, coupling methods, push pull amplifiers, operational amplifiers and wave shaping circuits. Multi-vibrators and flip-flops and their applications. Digital logic gate families, universal gate combinational circuits for arithmetic and logic operation, sequential logic circuits. Counters, registers, RAM and RGMs.</p>
1.3	<p>Micro-processors: Micro-processor architecture Instruction set and simple assembly language programming. Interfacing for memory and I/O. Applications of Micro-processors in power system.</p>

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1.4	Power Electronics: Power semi-conductor devices. Thyristor. Power transistor (IGBT), GTOs, and MOSFETs. Characteristics and operation. AC to DC Converters; 1-phase and 3-phase DC to DC Converters; AC regulators. Thyristor controlled reactors, switched capacitor networks. Inverters; Single-phase and 3-phase. Pulse width modulation. Sinusoidal modulation with uniform sampling. Switched mode power supplies.
1.5	Communication Systems: Types of modulation; AM, FM and PM. Demodulators. Noise and bandwidth considerations. Digital communication systems. Pulse code modulation and demodulation. Elements of sound and vision broadcasting. Carrier communication. Frequency division and time division multiplexing, Telemetry system in power engineering. Fibre optic cable communication system.
1.6	Indian Elect. Acts & Rules: Application of these to Railway working, checks to be carried out before commissioning Elect. Assets, functions and duties of Electrical Inspectors (EIG), Electricity Act 2003. Energy Conservation Act 2007, ECB Code, role of Lift Inspector, Lift & Escalators Rules.
2.0	Electrical Engineering Materials-
	Band Theory, Conductors, Semiconductors and Insulators, Superconductivity. Insulators for electrical and electronic applications. Magnetic materials. Ferro and ferri magnetism. Ceramics: Properties and applications. Hall effect and its applications. Special semi-conductors. Insulating material classification /Thermal affect, Solar PV modules
3.0	Theory and performance of Electrical Machines & equipment-
3.1	Basic concepts in rotating machines. EMF, torque, basic machine types. Construction and operation, leakage, losses and efficiency.
3.2	Direct current machines : Generation of EMF, work, power, Torque equation, armature winding, armature, reaction, theory of commutation, Inter-poles & compensating windings, characteristics


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	of shunts, series and compound generators, parallel running and load sharing of generators. Construction, Excitation methods. Circuit models characteristics and performance analysis. Generators and motors. Starting and speed control. Testing. Losses and efficiency.
3.3	Synchronous Machines. Construction. Circuit model. Operating characteristics and performance analysis. Synchronous reactance. Efficiency. Voltage regulation. Salient-pole machine. Parallel operation. Hunting. Short circuit transients.
3.4	Induction Machines. Construction. Principle of operation. Rotating fields, Characteristics and performance analysis. Determination of circuit model. Circle diagram, Starting and speed control, Fractional KW motors. Single-phase synchronous and induction motors, 3 phase Asynchronous motors and induction motors for traction application.
3.5	Transformers: Construction and testing. Equivalent circuits. Losses and efficiency. Regulation. Auto-transformer. 3-phase transformer. Parallel operation. Methods of cooling, Tap changing, parallel operation, polarity and phase sequence testing, protection Instruments, PTs & CTs, etc. Scott connection transformer.
4.0	Generation, Transmission & Utilisation-
4.1	Sources of energy, heat value of fuel, steam power station, Hydro Elect. Station, Nuclear power station. Pumped storage plants. Economics and operating factors.
4.2	Power transmission lines. Modeling and performance characteristics. Voltage control. Load flow studies. Optimal power system operation. Load frequency control. Symmetrical short circuit analysis. Z-Bus formulation. Symmetrical Components. Per Unit representation. Fault analysis. Transient and steady-state stability of power systems. Equal area criterion. Power system Transients. Power System Protection Circuit breakers. Relays. HVDC transmission.
4.3	Illumination standards of light, polar curve, Reflection and absorption, lighting calculations including design & economical layout of service building, workshop & yards. Various sources of light – fluorescent tubes etc.

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4.4	Electric traction : Advantages & disadvantages, speed time curve-traction motor, starting & speed control of DC series motors, power, consumptions, Regenerative braking, advantages and disadvantages of AC traction over DC traction, Tractive effort, Braking Effort.
4.5	Group & individual drive. Choice of drive & motors for various usages.
5.0	Measurements & instrumentation-
5.1	Units and Standards. Error analysis Measurement of resistance (high & low), potentiometer, wheat stone & Kelvin bridge, meggers for insulation resistance & earth resistance.
5.2	Voltmeters, ammeter, power factor meter, single phase watt meter, measurements of three phase power recording instruments, maximum demand meter. Watt hour meter, shunt, CT, PT.
5.3	Check meter
5.4	Transducers and their applications to the measurement of non-electrical quantities like temperature, pressure, flow-rate displacement, acceleration, noise level, etc. Data acquisition systems. A/D and D/A converters.
6.0	Mechanical Engineering Refrigeration etc.-
6.1	Various types of drives, belt, tooth gearing, rope and chain drive and Helical gears. Different types of bearings, ball, roller etc.
6.2	Heat pump cycle, vapour compression, estimation of cooling and heating levels and plant capacities, calculation of psychometric charts, condensers cooling and dehumidification, refrigerant and their properties.
7.0	Logical Reasoning-
	The test is given to the candidates to judge their power of reasoning spread in verbal and non verbal areas. The candidates should be able to think logically so that they perceive the data accurately, understand the relationships correctly, figure out the missing number of words, and to apply rules to new and different contexts. These

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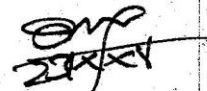
	indicators are measured through performance on such tasks as detecting missing links, following directions, classifying words, establishing sequences, and completing analogies.		
7.1	Chart logic A chart or a table is given that is partially filled in and asked to complete it in accordance with the information given either in the chart/table or in the question.		
7.2	Pattern perception: Here a certain pattern is given and generally a quarter is left blank. The candidate is required to identify the correct quarter from the given four alternatives.		
7.3	Figure matrix: In this more than one set of figures is given in the form of a matrix all of them following the same rule. The candidate is required to follow the rule and identify the missing figure.		
7.4	Rule detection: Here a particular rule is given and it is required to select from the given sets of figures a set of figures which obeys the rule and forms the correct series.		

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Paper -II

Maximum marks: 150	Qualifying Marks: 90
<u>Part-I</u>	
Establishment & Financial Rules	50 marks
<u>Part-II</u>	
Professional Subject	100 Marks

1.0	General Services-
1.1	General power supply arrangements, air conditioning etc.
1.2	Power Supply : HT & LT sources, power supply network, substation layout, overhead & under ground distribution, maintenance & operation of transformers, switch gears, protective devices & distribution lines.
1.3	Construction, erection & commissioning of new sub station distribution lines, line calculations etc.
1.4	House wiring metering & safety precautions.
1.5	Tariff & agreements, Relative merits of obtaining HT & LT supply, steps to reduce maximum demand, measurement of power, power factor, measuring demand etc.
1.6	Water supply & requirement of water planning of water supply system, sources of water pipe line frictional & other losses, discharge calculations.
1.7	Reciprocating centrifugal & turbine pumps, relative merit, choice of VS & HS pumps, characteristic curve of pumps, efficiency Drives, Elect. Connections & protections, Cavitations & priming of pumps, measurement of output with V-Notch & nozzle, necessity of multi stage pumping, storage capacity and purification of water.
1.8	Preventive maintenance, special failure of pumps & motors,



	periodical overhaul.
1.9	Air-conditions and Refrigeration :
	Central air-conditioning plant & package type system, refrigeration cycle, air changes, planning for capacity and drives for refrigeration plants, refrigerants and ducting.
1.10	Specification, design & testing of water coolers, central as well as package plants. Requirements of water coolers, window coolers & refrigerators.
1.11	Standby arrangement: DG sets, both petrol & diesel as also diesel pumps for water supply arrangements. Operation maintenance and overhauling.
1.12	Illumination, yard lighting, street lighting & town supply net work. Drives for workshop machinery.
1.13	Earthing & Bonding.
1.14	Commissioning & maintenance aspect of conventional & maintenance free earthing arrangement for general service application.
1.15	Maintenance of various equipment of sub-station, Energy Management, Important Instructions issued by Railway Board and RDSO.
1.16	Energy Consumption, Renewable Energy, Solar, Wind and biomass
2.0	Traction Distribution-
2.1	Systems of electrification in use and advantage and disadvantages of the different systems with emphasis on 2x25 KV system.
2.2	Feasibility studies and justifications for track electrifications, preliminary planning and design, procedure followed in taking up electrification scheme, working drawing for execution of OHE wiring plans and OHE layout plans.
2.3	Planning of layout of overhead equipments, Techno economic survey

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	for electrification of new lines, foot by foot survey, prepegging plans, precautions to be taken while wiring new lines, foundation & their types & use of wiring trains, final checking safety checks & certification, energizing of new lines, principles of preparation of lay out plans, provision of return conductors.
2.4	Overhead equipments – Types of overhead equipments, regulated and unregulated systems, stitches OHE, speed potential of various types of OHE, Centenary, contact wire, Dropper & Jumpers. Overlaps, clearances, Mast & portals, schedules of Dimension etc.
2.5	Maintenance problems with OHE, Foot Patrolling, current collection, use of Tower wagons, ladders & ladder trolleys, seasonal & cycle checks, maintenance Schedule, Insulator cleaning, straightening of out of plumb masts, earthing and bonds, return conductors, Preventive maintenance Tools, Types of Blocks & Procedure
2.6	Breakdowns, TRD works during breakdown and accidents, restoration procedure both temporary and permanent.
2.7	Overhaul schedule & anti-theft measures.
2.8	Organization & working of maintenance depots, repair workshops, training of staff safety measurements and precautions.
2.9	Power supply installation: Power supply arrangements, traction sub stations, feeding stations, SSP & SPs, 132 KV transmission lines, Railway owned sub stations, transformer maintenance, circuit breakers, current and potential transformers, protective relays, auxiliary transformers, interrupters and isolators.
2.10	Liaison with power supply authorities, monthly meter reading, control over maximum demand, emergency power supply arrangements. Automated Meter Reading.
2.11	Maintenance of switching stations.
2.12	Remote control system, remote control equipment for AC substations and its working. Operation and maintenance of remote control, Specialized equipments for remote control work.
2.13	Remote control centre, traction power control organization, permit to

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	work, emergency arrangements, coordination with operating and other departments. Liaison with supply authorities, emergency phones, safety precautions for electrified section.
2.14	Miscellaneous : Traction, stores and their accountal, regulation for electrical crossing of railway tracks.
2.15	Important instructions issued by Railway Board, RDSO's SMI./MS.TCs and related Investigation Reports.
3.0	Train lighting and air conditioned coaches
3.1	Designs, construction, principles of working schematic circuits diagrams of train lighting equipments used in train lighting system.
3.2	Coach wiring, under frame wiring, schedule of rewiring, couplers, lamp resistance, junction boxes and fuses, Generation to non-generation ratio, lights, fans and water raising apparatus.
3.3	Self generating coaches, End on-Generation, Head on Generation, power cars, electrical and mechanical components, layout, operation and maintenance procedures for slip coaches.
3.4	Train lighting batteries their maintenance, defects analysis of causes of failures and remedial measures. Simplified system of train lighting use of alternators, anti theft measures.
3.5	Fires in trains, preventive measures and precautions.
3.6	Periodic over haul and heavy repairs to train lighting equipment
3.7	Broad outlines of types of equipments used in 110 V and 415 Volt air conditioned coaches, scheme of refrigerated vans. Drives and their problems, maintenance and operational problems Refrigeration, compressors their types in service and their problems, gear boxes, their maintenance and alignment.
3.8	Maintenance schedule for AC coaches, partial AC coaches, AC I, II/ III coaches, Sleeper coaches. Running repairs.
3.9	Coordination with Mechanical, Operating and Security Department

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3.10	Important instructions issued by Railway Board, RDSO's SMIs, TCs and related investigations reports
4.0	Electric Locos-
4.1	Description of locomotives in service, principles of operation and characteristics of different types of locos used in electric traction on the Indian Railways.
4.2	Power, Auxiliary and control circuits: Their equipment, functioning, maintenance /overhauling schedules.
4.3	Various types of bogies and bogie suspension and their components, power transmission from traction motor to axles, traction motor mounting arrangement i.e. jacqueman drive, Quill drive, WN coupler: their equipment, functioning, maintenance/overhauling schedules.
4.4	Air, vacuum and Dual Break System, Air compressors, regenerative and rheostatic breaking, their equipment, functioning, maintenance/overhauling schedules.
4.5	Function of electric loco sheds and electric loco workshops.
4.6	Schedule inspection of locos i.e. IA, IB, IC, AOH, IOH and POH.
4.7	Records and registers maintained in loco shed, planning and progress organization, statistical data, rolling stock organization in sheds and shops, fire prevention, safety checks and history cards.
4.8	Important instructions issued by Railway Board, RDSO's SMI/MS/TCs and related investigation reports, AC Traction Manual.
5.0	EMU/MEMU/Metros
5.1	Utility of EMU trains for urban and suburban services vis-à-vis locomotives, various types of EMUs stock – AC, DC and AC-DC, their salient features, rake formation.
5.2	Power circuits, auxiliary, control circuit, break systems, bogies and other mechanical components, their equipment, functioning,

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	maintenance/overhauling schedules.
5.3	Inspection schedules of EMUs/MEMU/Metros, troubleshooting sequence.
5.4	Safety precautions and fire prevention checks.
5.5	Maintenance and overhaul organization and liaison with other department.
6.0	Electric loco and EMU operation-
6.1	Operation of electric locos with single unit and multiple unit and with rheostatic and regenerative breaking.
6.2	Safety features to be followed in the operation of electric locos and EMUs
6.3	Failures of electric locos and EMUs, their cause, investigation and remedial measures for avoiding failures.
6.4	Inter-relation between electric mechanical and operating department in functioning of electric locos and EMUs.
6.5	Function of traction loco control organization.
6.6	Preparation of engine links and driver links – power plan.
6.7	Compilation of operating statics for electric locos and EMUs operation.
6.8	Outstation organization for maintenance of electric loco and EMU.
6.9	Working rules for preparation/operation of elect. Rolling stock.
6.10	Recruitment and training of running staff – conversion training etc.
6.11	Accidents and re-railing technique of locos and EMUs.
7.0	Stores Matters-
7.1	Procedure relating to procurement of stock items, non-stock items,

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	distribution and accountal of stores.	
7.2	Receipt and custody of stores	
7.3	Sale of surplus stores.	
7.4	Inventory control.	
7.5	Schedule of Powers	
8.0	Engineering Matters-	
8.1	Estimates	
8.2	Execution of Work	
8.3	Contracts for work	
8.4	Procedure for traffic and engineering surveys	
9.	Disaster Management – Role of Electrical Officer.:	

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29/1/18