

Dated:- 15.07.2022

No:- ECR/HRD/GAZ/254/AEE (Gr.'B')/30%/2022

Secy. to GM/ECR: For kind information of GM

PS-I to AGM: For kind information of AGM

SDGM/ECR/HJP

General Manager (P)/CORE/Allahabad

General Manager/RITES/NDLS

PCEE/ECR/HJP

CAO(Con)/MHX/ECR/PNBE, CAO/WP/PNBE

CAO (GELF)/ECR/DMH

CPD/RE/DNR

Chairman/RRB/Patna & MFP

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/HQ/ECR/HJP

Principal/ZRTI/E.C.Rly/Bhuli & MFP

APO/MPP/ECR/HJP : for uploading on website.

SPO/Rectt/ECR/HJP

All Extra Divisional Units

Sub:- Limited Departmental Competitive Examination (LDCE) for the post of AEE (Gr. 'B') in pay band ₹ 9300-34800 (Level-8) Grade pay ₹ 4800 against 30% quota.

It has been decided with the approval of the Competent Authority to hold a LDCE for forming a panel against 05 vacancies (UR-04, SC-01, ST- Nil) of AEE (Gr.-'B') against 30% quota on E.C. Railway. The details are given below:-

(1) TENTATIVE PROGRAMME OF EXAMINATION & VIVA-VOCE

- (A) Date of examination
- (B) Venue
- (C) Duration
- (D) Viva-voce

:- } Will be
:- } intimated in
:- } due course.
:- }

(2) Eligibility:- (As on 13.10.2021)

- a) All permanent Group 'C' technical staff & running staff of Electrical Department working/holding lien in Electrical Department of East Central Railway in Pay Band Rs.9300-34800 (PB-2) with Grade Pay Rs.4200/- (Level- 6 in 7th 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) including those who are working in other Railways/units on deputation having lien and seniority over East Central Railway and completed minimum 5 years of non-fortuitous regular service in the grade(s) as on 13.10.2021 are eligible to volunteer for the LDCE.

NB.However, those Gr.'C' employees who have been provided Grade Pay 4200/- or above in PB-2 (9300-34800) under ACP /MACP are not eligible to volunteer for the above written examination.

The cut-off date of eligibility for selection against 30% quota (LDCE) is 13.10.2021 which is same as in selection against AEE/Gr. 'B' (70%).

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For 17/7/22
APM/MBE

- b) As per Railway Board's letter No. E(GP)2005/2/74 dt 13.03.08 (RBE 40/08), in case of persons 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.
- c) Those Railway employees who have come on own request transfer/mutual transfer and joined E.C. Railway after the cut-off date i.e. 13.10.2021 will not eligible to appear in this selection.
- (3) Eligible staff who desire to volunteer for the above LDCE may submit their application through proper channel to their respective Personnel Branch where they hold lien & seniority.
- (4) Eligible staff working in the Construction/Project Organization on deputation or in training or in any ex-cadre post, who desire to volunteer for the above LDCE may also submit their application through their respective Personnel Branch where they hold lien & seniority. The Personnel/Controlling Officers of the concerned Divisions/Units are advise to transmit the notification to the staff, who are on deputation through their Divisions/Units.
- (5) 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 employees well in time.
- (6) 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 candidates to be allowed for appearing in the examination.
- (7) The above LDCE will be based on the candidate's performance in Examination, viva-voce & record of service. Only the candidates, who qualify in the Examination, and found medically fit for Safety category post of AEE(Gr.B) as prescribed in Indian Railway Medical Manual will be called for Viva-voce test. The placement of the candidates in the panel will be based on their performance in Examination, Viva-voce test and Record of Service as per extant instructions of Railway Board and will be strictly as per merit.
- (08) **Pattern of Examination :-**
- i) The examination will be conducted as per guideline/instructions contained in Railway Board letter no. E(GP)2022/2/4 dated : 28.06.2022 (Copy attached as Annexure-"C").
- ii) Total marks and qualifying marks of "Viva-Voce and Record of Service" are as under :-

Head	Maximum Marks	Qualifying Marks
Record of Service -	25	30, in which 15 marks for Record of Service will be essential.
Viva-voce test -	25	
	Total 50 marks	

- (09) **Syllabus :-** As per Para-3 (V) of Railway Board letter no. E(GP)2022/2/4 dated : 28.06.2022 "Syllabus for 30% LDCEs for promotion to Group "B" post of AEE has already been issuedvide Railway Board's letter no.E(GP)2008/2/7 dated:27.01.2014 (RBE No. 14/2014).However, as it is based on old pattern when there were two Papers- Papers-I & Papers-II in the LDCEs, the Centralised CBT shall be held from the said syllabus after amalgamating the topics prescribed in Paper-I and Paper-II of respective syllabi. The syllabus of old pattern for Paper-I & II is enclosed herewith as Annexure-"B".
- (10) a) The Controlling Officers should give the wide publicity of this notification amongst the eligible staff under their control and ensure submission of applications by the candidates in the prescribed proforma (Specimen copy of format is enclosed as Annexure-'A').
- b) The last date for submission of the application by candidates is 31.07.2022.
- c) The Controlling Officers are also advised that applications submitted by the candidates (in prescribed proforma) must be forwarded to concerned Personnel Branch/Unit office by 01.08.2022.
- d) The applications should be scrutinized properly in Personnel Branch with the Service Record to avoid further complications. The applications should also be signed by the Controlling Officer with official seal and should have the counter signature of the concerned 'Personnel' Branch Officer to avoid any factual errors.

*For 15/7/21 ~
APC/m&E*

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- e) All the scrutinized applications should be sent in a bunch through special messenger to Dy.CPO/Gaz./ECR/ HJP on or before **03.08.2022** positively. Applications forwarded after the target date will not be entertained under any circumstances.

It may also be noted that application other than in prescribed proforma, having incomplete information or without signature of the candidates, duly signed by Controlling Officer and countersigned by Personnel Branch Officer will not be entertained and will be rejected summarily.

- (11) In case the service particulars furnished by the volunteers and certified to be in order by the concerned authority are found incorrect/false subsequently, the candidature of the volunteer will be liable to 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 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. **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./HQ by 03.08.2022** indicating 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 individuals giving reasons thereof by the concerned Unit/Divn where lien and seniority of concerned staff held.

1	2	3	4	5	6	7	8	9	10		
Sl. No	Name of the employee	Desig.	DOB	DOA	Working Under	Community (UR/SC/ST)	Date of Regular promotion to Grade Pay		Total service in (GP) Rs.4200/- (Rs.2400/- in case of L.P.S. II) & above in Elect. Deptt as on 13.10.2021		
							GP 4200	GP 4600	Year	Month	Days

(13) **TRAINING OF SC/ST CANDIDATES:-**

In terms of Railway Board's letter no. E(GP)2010/2/39 dated : 28.08.2019 (RBE No. 142/2019) Pre-selection training for SC/ST candidates for selection to be imparted. "The pre-selection training should be spread over 15-20 working days (3-4 weeks). Further pre-selection training being imparted should not be less than 60 hours". Pre-selection training of SC/ST candidates will be arranged by the department concerned. PCEE/ECR/HJP is requested to nominate one JAG or above officer of Electrical Department as an In-charge of Pre-Selection training for the SC/ST candidates. The In-charge of Pre-Selection training will intimate the date and venue of the Pre-Selection training to the eligible SC/ST candidates in due course.

If any SC/ST candidate refuse to undergo Pre-Selection training, 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 will ensure that the SC/ST candidates under their control should be spared well in time without fail to participate in such training.

The SC/ST candidates may also be advised to insist their Controlling Officers, in their own interest to spare them for the said training.

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For M&E
APC/M&E

(13.1) Duty of the In-charge of Pre-Selection training (Nominated by PCEE):-

- (i) To inform in writing through special messenger to the concerned SC/ST employee with details of date, time & venue of coaching.
- (ii) To obtain in writing unwillingness for training (if any), from the concerned SC/ST employees.
- (iii) To arrange sparing of the candidates and liaison with respective Controlling Officers/Supervisors.
- (iv) To chalk out training schedule and adhere to it.
- (v) To ensure maintenance of daily attendance of SC/ST candidates on the attendance sheet, who attend the training.
- (vi) After completion of such training, the In-charge of the Pre-Selection training will give a written report along with all supporting documents/papers including attendance sheet of SC/ST participants to Dy.CPO(Gaz)/ECR/HJP immediately after completion of Pre-Selection training for records and further action. On receipt of compliance report of Pre-Selection training, written examination will be conducted.

(13.2) Duty of Controlling Officer:-

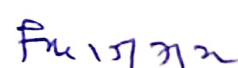
To spare the candidates under their control well in time without fail with direction to participate in the coaching.

(13.3) Duty of concerned SC/ST applicant:-

- (i) To manage 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 training on the same date. No representation will be entertained in case of failure to report to the concerned In-charge of Pre-Selection training and it will be deemed for refusal for such training.
 - (iii) Failure of concerned SC/ST employees to avail Pre-Selection training on any account including leave etc. will be considered on their part and will not entitle them to additional training classes.
 - (iv) No appeal will be entertained by GM(P)/ECR/HJP after completion of Pre-Selection training.
- (14) The eligible staff should also be advised that no Suplimentary examination would be held for the absentees under any circumstances. As per rule, there is no provision of absentee exam in LDCE.
- (15) The controlling/authorized officer should ensure the issue of individual sparing letter/identity slip duly attesting specimen signature of the candidate on the sparing letter/identity slip. The candidates without proper sparing letter/identity slip will not be allowed to appear in the examination.
- (16) Concerned Personnel Branch Officer & Controlling Officers should ensure submission of service records and ACRs/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 written examination through special messenger to this office.
- (17) The above selection will be held as per procedure laid down in Master Circular No. 68 governing promotion from Gr. 'C' to Gr. 'B' issued by Railway Board and the instruction issued time to time by Railway Board. 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 item 15 of Master Circular 68.
- (18) Application received after the target date should not be entertained and the same should be disposed off at the Division /Extra Divisional level by rejecting them on account of late receipt under advice to this office.

Please acknowledge receipt.

- DA :- i) Proforma of application (Annexure 'A')
- ii) RB letter no. E(GP)2022/2/4 dated : 28.06.2022 (Annexure 'C')
 - iii) Syllabus (Annexure 'B')


(Trilok Nath Verma)
Asstt. Personnel Officer/M&E
For General Manager (P)

ANNEXURE- "A"

**PROFORMA OF APPLICATION TO BE FILLED UP BY THE VOLUNTEER FOR SELECTION OF
AEE/Gr.('B') AGAINST 30% QUOTA ATTACHED WITH THIS OFFICE NOTIFICATION NO.
ECR/HRD/GAZ/254/AEE(Gr.B)/30%/2022 Dated.- 15.07.2022**

1. Full Name (in Block Letters) :-
2. Designation and station :-
3. Working under :-
4. Date of Birth :-
5. Date of appointment (Post with Grade pay and Department) :-
6. Divn/Unit where lien/seniority held :-
7. Dt. of Joining in Present lien/seniority unit :-
(Please mention :- Direct Rectt./Own request transfer/Mutual transfer/Administrative ground)-
8. PF/NPS No. :-
9. Educational Qualification :-
10. Whether the candidate belongs to SC/ST :-
11. Community (if yes, a copy of caste Certificate duly attested by a Gazetted Officer should be enclosed.)
Date of appointment/promotion to the following grade on regular basis (7th CPC) in Elect. Deptt. :-

Pay-Band & Grade-Pay	Date	Month	Year
(a) Level 4 in 7 th CPC (PB-II, GP- 2400 in 6 th CPC) (For Loco Pilot Shunting-II only)			
(b) Level 6 in 7 th CPC (PB-II, GP- 4200 in 6 th CPC)			
(c) Level 7 in 7 th CPC (PB-II, GP- 4600 in 6 th CPC)			

12. Length of non-fortuitous service (Regular Promotion) in the following grade in present lien/seniority unit (Elect. Deptt.) as on 13.10.21 .

Pay-Band & Grade-Pay	As on	Year	Month	Days
(a) Level 4 in 7 th CPC (PB-II, GP- 2400 in 6 th CPC) (For Loco Pilot Shunting-II only)	13.10.21			
(b) Level 6 in 7 th CPC (PB-II, GP- 4200 in 6 th CPC)	13.10.21			
(c) Level 7 in 7 th CPC (PB-II, GP- 4600 in 6 th CPC)	13.10.21			

13. Present pay scale & date of promotion to present scale/Grade Pay:-

DECLARATION OF THE CANDIDATE:-

- (i) I..... do hereby declare that, I have completed 05 years non-fortuitous Service in Pay Band Rs. 9300-34800 (PB-2) with Grade Pay Rs.2400/Rs.4200 and above in Elect. Department as on 13.10.2021 and also fulfilled other eligibility criteria of the said selection.
- (ii) I..... do hereby also declare that the above particulars furnished by me are true to the best of my knowledge and belief. I further undertake that any above entry 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 EMPLOYEE

Designation with Date
Mobile no. of employee

- (A) Forwarding the application (filled-up) submitted by the candidates to the Cadre Controlling Officer (Personnel Branch) by his /her controlling officer:-
The service particulars/Bio-data on the prescribed proforma filled-up by the Shri/Smt. _____ Designation _____ received within the target date is hereby forwarded to his/her respective Cadre Controlling officer (Personnel Branch) for verification with the service record and also for onward transmission to the GM(P)/ECR/HJP.

SIGNATURE OF CONTROLLING OFFICER
(With office seal & date)

- (B) Certificate to be furnished by the Cadre Controlling Officer (Personnel Branch):-
If the volunteer come under the circumstances mentioned in para 2(b) of the notification, the service rendered by immediate senior employee as on 13.04.19 should be indicated invariably in the following format.

No	Name (S/Shri) of immediate senior	Desig.	Pay Band (II) & GP	Year	Month	Day
			Level 4 in 7 th CPC (PB-II, GP- 2400 in 6 th CPC) (For Loco Pilot Shunting-II only)			
			Level 6 in 7 th CPC (PB-II, GP- 4200 in 6 th CPC)			
			Level 7 in 7 th CPC (PB-II, GP- 4600 in 6 th CPC)			

It is certified that the service particulars/Bio-Data furnished by Shri/Smt.
Designation..... on the above proforma have been verified with his/her service record and found correct. The above mentioned candidate is eligible to appear in the said selection; accordingly the same is hereby forwarded to GM (P)/ECR /Hajipur for further necessary action.

SIGNATURE OF THE PERSONNEL OFFICER
(With office seal & Certification date)

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

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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

RBE NO.: 14/2014

No.E(GP)2008/2/7

New Delhi, dt: 27.01.2014

The General Managers,
All Indian Railways and Production Units.

Sub: Syllabus for professional papers for 30% LDCE for promotion to Group 'B' posts of AEE in Electrical Engineering Department of Railways/ Production Units.

Ref: Railway Board's letter No. E(GP) 79/2/30/6 dated 09.11.1979

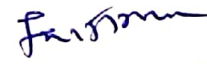
Revised syllabus for professional papers for Limited Departmental Competitive Examination (LDCE) for promotion from Group 'C' to Group 'B' posts in Electrical Engineering Department of Railways/Production Units is enclosed for guidance. This may be given wide publicity and circulated amongst the eligible candidates.

2. The revised syllabus shall be effective from the date of issue of this letter. However, LDCEs for which written examinations have already been held or which are under process, need not be disturbed.

3. Please acknowledge receipt.

Encl: As above


(ASHOK KUMAR)
DIRECTOR, ESTT.(GC)
RAILWAY BOARD


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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	50 Marks
I. General Knowledge		
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	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. 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.
1.3	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.

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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,

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	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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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. E(GP)2022/2/4

New Delhi, dt:28/06/2022

The General Managers,
All Indian Railways and Production Units.

The DG/NAIR/Vadodara.

(Kind attn.: PCPOs/PFAs/Dy.CPO(G)/Dy.CAO(G))

Sub.: Promotions to Group 'B' posts on Indian Railways - Introduction of Centralized Computer Based Objective type examination (CBT) in all departments having Organised Services.

The Selections and Limited Departmental Competitive Examinations (LDCEs) for promotion to Group 'B' posts are presently conducted by the respective Zonal Railways/Production Units independently in terms of Recruitment Rules, provisions contained in the IREM VOL.I and instructions issued by the Board from time to time. As part of measures taken by the Board for bringing in reforms in the Selection process for promotion to Group 'B' posts on the Railways, instructions were issued vide Board's letter no.E(GP)2018/2/31 dated 19.03.2019 for including 100% objective type Multiple Choice Questions in the written examinations held as part of Selections and objective type pre-qualifying examination for LDCEs was also introduced.

2. Now, furthering these efforts, Board has decided to introduce **Centralized Computer Based Objective Type examination** for conducting 70% Selections and 30% LDCEs in all Department having Organised Services from the vacancy cycle beginning from w.e.f.1.1.2023.

3. To begin with LDCEs of current vacancy cycle, where Selections have since been conducted/or are being conducted and where LDCEs are yet to be notified or have been notified but written examination(Pre-qualifying) has not been held, will be conducted through Centralised CBT in all Organised departments as per modalities detailed as under:

i) The CBT shall be conducted by DG/NAIR who shall coordinate with the concerned Zones/PUs for its smooth conduct. All the Railways should advise the Department-wise, community-wise vacancies of their LDCE quotient of on-going vacancy cycle to DG/NAIR latest by 11th July. Herein, it is also clarified that the increase in the percentage of dispensation given to the Zones/PUs for inclusion of JTS/Gr.A vacancies in the vacancies assessed for Group 'B' selections in terms of instructions contained in Board's letter no.E(GP)2005/2/61 dated 20.06.2022 is applicable for assessment of

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Group 'B' vacancies to be made for fresh vacancy cycle and the **vacancies already notified** are not to be amended.

ii) LDCE will be one stage only and will comprise of only 1 Paper with the following set up:

(a) Single paper of 150 marks comprising 100% Objective type Multiple Choice Questions with following distribution of marks:

(a)(i) Technical (Professional) subject : 80 marks

(a)(ii) General Knowledge including optional : 40 marks

Questions of 15 marks on Official language Policy & Rules

(a)(iii) Establishment & Financial Rules : 30 marks

(b) **Qualifying Marks** : **90**

(c) **Duration** : **3 Hours**

(iii) Question Paper will have 175 questions out of which 150 questions are to be attempted.

(iv) 1 mark will be allotted for every correct answer. There shall be negative marking for incorrect answers and $\frac{1}{3}^{\text{rd}}$ of Marks allotted for each question will be deducted for every wrong answer.

(v) **Syllabus**- Syllabus for LDCEs for Organised services has already been prescribed by Board. However, as it is based on old pattern when there were two Papers - Paper-I and Paper-II in the LDCEs, the Centralised CBT shall be held from the said syllabus after amalgamating the topics prescribed in Paper-I and Paper-II of respective syllabi.

(vi) Optional Questions on Official Language policy and Official Language Rules in the LDCEs shall be included in terms of provision contained in Para 204.3 of IREM Vol.I.

(vii) Examination for 30% LDCEs will be held on a single day only. On the same day exam for the post of APO will be held in the second shift so that candidates who have appeared in exam for AMM/ACM/AOM in the first shift and also want to appear for APO can do so in second shift. Similarly, exam for AME and AEE will also be held in different shifts with a gap of 3 hours between both the shifts.

(viii) Railway-wise list of candidates along with marks scored by them in the written examination will be prepared by DG/NAIR assigned the task of conducting the exams and will be furnished to respective Zones/PUs.

From
APO/AME

(ix) Medical & Viva-voce of successful candidates will be conducted by the respective zones and thereafter final panel will be issued by them according to the vacancies on the basis of merit positively **within one month** from the date of receipt of result from NAIR.

(x) CBT for 30% LDCEs for a particular department for Zones/PUs will be held **on the same day** across Indian Railways. Thereafter **no request** for a supplementary exam shall be entertained in any condition.

4. The tentative schedule for finalizing the various stages in LDCEs of current vacancy cycle through CBT is given as under:

- | | |
|--|-------------------------|
| a) All notifications may be issued, if not issued by - | 15 th July |
| b) Cut-off date for submission of options - | 31 st July |
| c) Finalization of eligibility list and its notification - | 15 th August |
| d) Pre Selection training to be completed by - | 31 st August |
| e) Examination - | mid September |
| f) Finalization of the panel (medical & viva including assessment of APAR) - | mid October. |

4.1 As the Railways are well aware, the need for sticking to the schedule stipulated for finalization of various stages of the LDCEs **is the essence** for successful conduct of Centralised CBT. Therefore, all the Railways/PUs should stick to the aforementioned schedule and no request for deviation in any case shall be entertained.

5. Modalities for introduction of Centralised CBT in Selections/LDCEs to be introduced from the fresh vacancy cycle beginning from 1.1.2023 shall be circulated separately.

6. There is no change other than the changes narrated above in the extant instructions issued from time to time in respect of other aspects of LDCEs held for promotion to Group 'B' posts.

M. Saluja
28/06/22

(Meenakshi Saluja)

Dy. Director, Estt.(GP)III

Railway Board

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For
AP of M&E