

East Central Railway

No. E/GAZ/Panel/APO(Gr.'B')70%/Pt.I

Dhanbad, dt. 19.11.2024

**All Concerned,
E.C Railway, Dhanbad**

**Sub:- Selection for the post of APO, AMM, ASTE, AEN & AEE (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) GM(P)/ECR/HJP's letter No ECR-HQ0PERS(Gaz)/0062/2024,
dt. 18.11.2024.
(ii) GM(P)/ECR/HJP's letter No. ECR-HQ0PERS(Gaz)/0064/2024,
dt. 18.11.2024.
(iii) GM(P)/ECR/HJP's letter No. ECR-HQ0PERS(SEL)/0010/2024
dt. 18.11.2024.
(iv) GM(P)/ECR/HJP's letter No. ECR-HQ0PERS(Gaz)/0061/2024
dt. 18.11.2024.
(v) GM(P)/ECR/HJP's letter No. ECR-HQ0PERS(SEL)/38/2023
dt. 18.11.2024.

A copy of GM(P)/HJP under references are enclosed herewith for information & necessary action, which is self explanatory.(Copy enclosed)

DA: As above.


for Sr. Divisional Personnel Officer
E.C. Railway, Dhanbad

Copy to

- ❖ Ch.OS/IT/DHN; for uploading on website.

EAST CENTRAL RAILWAY

Office of the
General Manager (P)
Hajipur

No. ECR-HQ0PERS(Gaz)/0061/2024

Secy. to GM- for kind information of GM,
Dy.Secy. to AGM – for kind information of AGM.
PS-I to PCPO- for kind information of PCPO.
PCE/ECR/HJP, SDGM/ECR/HJP, PFA/ECR/HJP.
CAO/Con/South & North/MHX,
CAO/WPO/Patna, CAO/GLP/Patna.
DRM/ECR-DNR, DDU, DHN, SEE & SPJ.
All Chief Engineer/Con/MHX.
Sr. DENs/DENs/ECR-DNR, DDU, DHN, SEE & SPJ.
Sr.DPOs/ECR- DNR, DDU, DHN, SEE & SPJ.
CWM/PD/ECR/DDU, WS/SPJ & CRW/HRT.
Chairman RRB/Patna & MFP. Chairman/RRC/Patna.
Principal/ZRTI/E.C.Rly/Bhuli & MFP.
Dy.CPO/IR&W/HJP, SPO/Con/MHX/Patna.
APO(MPP)/ECR/HJP- for uploading on WEBSITE.
All Extra Divisional Units.
General Secretary/ECROA, ECRPOA & ECRKU.

Sub :- Selection for the post of Assistant 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.

With approval of General Manager/ECR, it has been decided to hold a selection for formation of the panel against **39** vacancies for the post of **Assistant 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 (*)
AEN (Gr."B") 70%	31	4	4	39	2

(*) Horizontal Reservation for PwBD as per Railway Board's letter No. E(GP)/2022/2/20 dated- 18.08.2022 & 14.11.2022 :- (Distribution of 02 posts- first for LD and second for HI(HH))

(i) Locomotor Disability (LD) – One Arm (OA)/One Leg (OL), Leprosy Cured, Acid Attack victims

(ii) Hearing Impaired {HI(HH)}

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.

- (a) Written Examination through CBT :- **09.03.2025 (Tentative)**
(b) Venue, Time & Viva-voce :- Will be notified in due course.

2. Eligibility (As on 01.01.2025)

- All Permanent Group 'C' Technical & employees of Civil Engineering Department working/holding lien in Civil Engineering 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 as on 01.01.2025, are eligible to apply for the above mentioned selection.

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.

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- (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 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.
- (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 CBT/Written Examination held as part of Selections (70%) where the final panels are made on seniority basis.

Since AEN 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 AEN in Civil Engineering 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. PCE will nominate the JAG or above officer of Civil Engineering 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/ST 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 PCE/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.

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

- (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.

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(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 be 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 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. **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.**

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- (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 proforma attached as Annexure- B addressed to Dy. CPO/Gaz./HQ by **09.12.2024** indicating therein the total number of applications forwarded. The details in proforma attached as Annexure- B should also be sent in soft copy in MS/Excel format. 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>About Indian Railway... > Railway Board Directorate... > Establishment...> E(GP) Circular.... > Master circular 68.

Please acknowledge receipt.

DA : (i) Proforma (Annexure-'A')
(ii) Proforma (Annexure-'B')
(iii) Syllabus (Annexure-'C')

Signed by

Ajeet Kumar

Date: 18-11-2024 18:04:09

APO/Gaz
For General Manager(P)/HJP

Annexure 'A'**PROFORMA OF APPLICATION FOR AEN/(Gr.'B') 70% QUOTA AGAINST NOTIFICATION****No. ECR-HQ0PERS(Gaz)/0061/2024 dated 18.11.2024****(It is mandatory to fill each and every column with correct information.)****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 involved)	
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 : 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-II GP-4200					
(b) 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)**

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(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 leves(GP)	Whether ORT or Mutual	Year(s)	Month(s)	Day(s)
			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

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

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

Syllabus for Financial Rules:

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

**SYLLABUS FOR 70% SELECTION FOR PROMOTION TO GR.B POST OF AEN IN
CIVIL ENGINEERING DEPARTMENT.**

(A) Civil Engineering (General)

1. Surveying

a. Types

i. Surveying basics

Basic principles; base lines; check lines: perpendicular and oblique offsets; conventional signs; plotting of survey; true and magnetic bearings; open and closed traverses; recording plotting of traverse, closing errors.

ii. Surveying equipment

Auto level, Total station, DGPS, LIDAR.

iii. Leveling -

Level Lines - datum, bench marks, simple leveling, fly leveling; recording the levels in field book; method of reducing levels; arithmetical check; longitudinal and cross section contouring.

iv. Theodolite Survey -

Types of theodolites; measurement of horizontal angles, vertical angles, magnetic bearings and deflection angles; prolonging a straight line; traversing by method of included angles; balancing the survey - closing errors; calculations of latitude and departure.

b. Curves-

Elements of simple circular curves, setting out simple circular curves.

c. Set out works -

Setting out buildings, culverts, Central line of Railway alignment. Usage of GPS technology in setting out Centre line of Railway alignments.

2. Strength of Materials, Structural Designs & Drawings

a) Strength of Materials:

Stress, strain, Hooke's law, working stress, factor of safety; bending moment and shear force in simply supported beams and cantilevers; simple theory of bending.

b) Structural Design & Drawing Drawings

Different sizes of paper, folding and storage of drawing, plan, elevation, sections, isometric view.

c) RCC Structures

RCC, methods of design, Working Stress Method and Limit State Method. IRS Code

of Practice for RCC (Concrete Bridge Code).

d) Steel Structures

Rivets and welds. Sketch and detailing of connections different types of joints and strength determination. IRS Steel Bridge Code.

3. Construction material:

Description, specification, properties and uses of building materials - stones, sand, timber, bricks, cement, lime, building hardware, paints varnishes, glasses, and tiles. Concrete mix design, placing, compaction and durability.

4. Foundation & Construction Engineering

a) Soil Mechanics

Different type of Soils, Three phase diagram and their relationships, IS classification of soil, index and engineering properties of soil, compaction, consolidation, shear strength, earth pressure theories, slope stability. Specification and construction of earthwork in embankment and cuttings.

b) Foundation Engineering

Functions of foundation, different type of foundations - open foundations; well foundations and pile foundations, determination of safe bearing capacity, stress and settlement analysis, method of reducing differential settlements.

(B) Civil Engineering (Railways)

1. Railway Surveys & Construction

Provisions in Engineering Code regarding - Classification of Surveys, Terms of Reference, Principles governing Railway alignment, Ruling gradients, Grade compensation for curves, Horizontal and vertical curves, Hill Surveys, Catch sidings, Tunnels, preparation of various maps and drawings, preparation of Survey reports for RECT, PECT and FLS, Project estimates.

2. Railway Track.

(a) Track Structure and Components.

Classification of Lines, Track Structure, Rail and Rail fastenings, Sleepers & Fastenings, Ballast- Specifications, Ballast Profile/Section/Depth of Cushion, Formation- Classification of Formation Requiring Treatment and Remedial Measures Suggested, Insulated joints & Switch expansion joints, Track structure on Bridges.

(b) Duties.

Duties of ADEN, Duties of SSE/P.Way (In-charge), Duties of JE/ SSE/ P.Way (sectional), Duties of JE/ SSE/ P.Way (Other than sectional), Duties of Gang mates, Keymen, Patrolmen, Gateman and Track maintainer.

(c) Maintenance of Permanent way.

Regular track maintenance, Handling and maintenance of rails, sleepers, fastenings & other misc. Items, Works incidental to regular track maintenance, Record keeping, Maintenance of track in track circuited areas, Maintenance of track in electrified

areas.

(d) Special Maintenance Works.

Alumino Thermit welding of rails, Flash-Butt welding of rails, Short welded Rails, Long welded Rails. USFD.

(e) Curves and Turnout.

Curves, Realignment of curves, Points and Crossing.

(f) Track tolerances and Track Monitoring.

(g) Schedule of dimensions.

Schedule-I Standard dimensions, Station Yards and extra clearance on curve.

(h) CRS sanction for works affecting passenger running lines.

(i) Training and Competency of Permanent Way Staff.

(j) Permanent Way renewals.

(k) Engineering Restrictions and Indicators.

(l) Level Crossings and Gateman.

(m) Working of Trolleys, Lorries and Material trains etc.

(n) Track Management System.

(o) General:

Reference to G & SR; types of signals and their significance; rules for working of trains; block working rules - types, Introduction of temporary single line working.

(p) Accidents:

Action during accidents including breaches, Restoration of through running, Pre-monsoon precautionary measures.

3. Maintenance of Bridges

a) Maintenance of bridges:

Responsibility of the Engineering officials, action to be taken after inspection of bridges; maintenance of substructure - abutments, piers, wing walls and return walls, maintenance of arches, dismantling of arches. Details of common repair techniques - cement pressure grouting, epoxy grouting, shotcreting / Guniting. Maintenance of RCC & PSC super structures - periodical maintenance, common defects and repair / strengthening techniques; maintenance of super structure (steel) girders - loss of camber in steel girders, cracks in steel works, strengthening of weak girders, replacement of loose rivets; maintenance of HSFG bolts, corrosion and its prevention, protective coatings by painting - periodicity and precautions, patch

painting, ordinary paints - for severe and no severe corrosion, metallising & epoxy based paints, Maintenance of welded girders; maintenance of composite girders. Various defects in bed blocks and their remedies; maintenance of bearings; Precautions while carrying out maintenance works on bridges.

b) Inspection of bridges:

Classification of bridges - major, minor, important; Inspection of Bridges by Permanent Way and Works Inspectors, by Bridge Inspectors (SSE/JE- P. Way, Works, Bridges) – Periodicity/ schedule and details of inspection, record of bridge inspection, registers to be maintained by the Bridge Inspectors, Certificate of inspection. Inspection by Assistant Divisional Engineers - Bridge Inspection Register, Numerical Rating System (NRS), Unique Rating Number, Condition Rating Number, Overall Rating Number, Certificate by the Assistant Engineer. Details of Inspection of Bridge –foundations, Flooring, masonry in substructure, under-water substructure inspection, arch bridges, protection works and water ways, girder alignment and seating, structural condition of girders, track on the bridge and its approaches, trolley and safety refuges, foot paths, painting, marking HFL and danger level, providing foundation particulars and bridge name boards, flood records at important bridges, road over/under bridges, concrete bridges, special Inspection during Monsoon, equipment required for inspection of bridges. painting of steelworks, laying of bridge sleepers; replacing cracked bed blocks.

4. Rehabilitation of Bridges

Reasons for Rehabilitation, special Strengthening, Imposition of speed restriction, Priority for rehabilitation of bridges, Special Inspection, Site Data, Execution of rehabilitation works, Precautions when working on bridges; rebuilding or alterations to bridges - design and execution of bridge works; temporary arrangements; false work for erection of girders; assembly and erection of girders; cranes for erection of girders; testing of girders; proposal for strengthening existing girder spans: methods of regirding major bridges, Strengthening of foundations, Strengthening/rebuilding of substructure, shaken/displaced/ cracked bed blocks, distressed arch bridges, replacement of nonstandard girders, replacement of pipe culverts, distress in parapets, replacement of small opening, distress in superstructure.

5. Rivers & Floods

Behavior of rivers; past history of bridges, danger level at bridges, watchman at important bridges, duties and equipment of bridge watchmen; special inspection during monsoon, action to be taken in the case of weather warning, pitching stone, boulder and monsoon reserve; vigilance during floods; flood records during and after the monsoon; survey of the course of river. Rivers and flood register, Flood Reports, rainfall data, provision of anemometer on bridges. River training works, Guide Bunds, Spurs (Groynes), Marginal Bunds, Closure Bunds, Assisted Cut-Offs, Boulder crates, Protection of approach banks, drop wall & curtain wall i.e. protection measures for minor bridges.

6. Inspection and Maintenance of Tunnels and Deep Cuttings:

a) Tunnels - Inspection by Engineering officials, items to be covered in the

Inspection, record of inspection, mobile staging for inspection, details of tunnel inspection, ventilation of tunnels, leakage in tunnels and methods of correction, works connected with the maintenance of tunnels.

b) Deep Cuttings - General, inspection register of vulnerable cuttings, points to be noted during Inspection of cuttings, action to be taken in the case of boulder drops, action to be taken after inspection of cutting, guarding of vulnerable cuttings.

7. Inspection and Maintenance of Building and Structures (Other than Bridges)

- a) Inspection & Maintenance of buildings & structures (including steel structures).
- b) Building Registers
- c) Periodical maintenance of Works including repairs to leaky roof/water proofing of roofs.
- d) Standard Measurement Registers for Buildings.
- e) Dismantling of buildings/structures.
- f) Retro-fitting / structural repairs of existing weak buildings/structures.

8. Maintenance of sanitary and hygienic conditions in station and railway Colonies; water supply, drainage and sewerage

a) Water Supply

I. Standards of Quality of drinking water- physical; chemical and bacteriological standards of water, Water-borne diseases, water demand-methods of forecasting, sources of water; Method of treatment of water – aeration; sedimentation; filtration (slow and rapid sand filters); disinfection; hardness methods of removal etc.

II. Conveyance and Distribution:-

Preparation of Schemes for New Water Supply/ Augmentation of Existing Water Supply; Estimating Requirements of Water, water supply from outside sources, Types; Selection & Installation of Pumps; Capacity of Pumping, Conveyance of Water Rising mains; systems of distribution, residual pressure; different types of pipes and fittings; testing of pipes, Pipe laying and Fittings of Valves and Meters, Storage tanks; Capacity, Maintenance and Cleaning of Storage Tanks, Water-Supply Plans, maintenance and operation of water supply installation - responsibilities of Engineering department, Mechanical department and Electrical Department.

III. Rain water harvesting – legislation, necessity; advantage; types; techniques; estimation of capacity of rain water harvesting pits/ salient methods of recharging subsurface aquifer etc.

IV. Water Audit and water Management:

Conservation of Water, water reuse, water recycling, water recycling plant, flow measurement system, identification of losses & leakages.

b) Sewerage:

Preparation of schemes for sewerage, sewage & water collection and carriage; design of sewers; house connection; storm water drains; maintenance of sewerage and drainage, conservancy and sanitary arrangements, disposal of sewage – river pollution and control; sewage treatment; land irrigation, septic tanks, primary clarifier, sludge and scum removal, trickling filters, activated sludge process, sludge digesting, principles of anaerobic digestion, sludge gas, sludge drying and disposal.

c) Sanitation:

Formation of sanitation committee ; Inspection by sanitation committee , sanitary arrangements in stations and colonies, drinking water wells-protection; Cleaning of wells; disinfection; prevention of Infectious diseases; disinfection of quarters.

9. Acquisition, management and disposal of land: General Codes, Manuals, rules:

Ownership of Railway land; sanctioning authority for acquisition and relinquishment; Principles of acquisition and relinquishment; Procedure for acquisition and relinquishment; Land plans and schedule; Documents of Handing over and taking over Railway Land; Land Records- Responsibility and procedure for demarcation, verification of railway boundary , land plan etc. maintenance of right of way; religious structure. Management of railway Land leasing, licensing of land, way leave facility and easement rights, grow more food. Leasing licensing for merchants and vendors at stations, bulk oil installation. Encroachment and responsibly; rules for permission for construction of building near Railway land; instructions regarding cutting/trimming and sale of natural product like mature tree, dry trees within and outside railway boundary, near electric or telegraph lines , sale of grass right etc. Provisions of Land Acquisition Act. 1989, Right to fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013.

10. Preparation of Plans and Estimates:**(a) Preparation of plans:**

General procedure; plan for other departments; size of drawings; titles and numbering of drawings; scale of drawings; details on drawings; symbols and colours in drawings; RDSO drawings; CE's plans; Plans of Divisional/Asst. Engineer's/inspector's Offices; completion drawings;

(b) Preparations of estimates:

Engineering code provisions, various types of estimates, technical details, rates and quantities; schedule of rates and price - listing of stores; report and justification; rent statement for staff quarters; special features of estimates for remodeling of station yards, track renewal works, deposit works: Urgency Certificate;

11. Contract and Execution of Work:

a) Contract:

Engineering code provisions, schedule of rates; analysis, non-schedules rates, tenders; types; tender documents, drawings and specifications, tender committees, acceptance of tenders, contracts; types, contract documents, General and special condition of contract; measurement and measurement books - code reference; recording measurements; 'on account' and final measurements; standard measurements books ; responsibilities of inspectors/JE/SSE) and Asst. Engineers for measurement of works; ballast measurement; computation quantities; preparation of abstract in measurement books; submission of bills; checking of bills; bill registers; Variations; PVC; Basics of Arbitration.

b) Execution of Work:

Engineering code provisions, agencies for executing works; responsibilities of executive officers; deposit works; excess and savings on estimates; attention to public interests; prevention of accidents; planning - activity, milestone, bar charts, critical path networks, PERT; departmental execution of work - record; progress reports, charges for stores and labour, execution of works in Engineering workshops; contracted works; issue of work orders; completion documents; zonal works.

12. Track Machines:**a) Organizational structure, duties and inspection:**

Duties of Executive (XEN)/Assistant Executive Engineer (AXEN)/TM/Line, Duties of SSE/TM/SDI, Duties of SSE/JE/TM Working on Machines, Duties of SSE/JE Machine In-Charge Duties of Machine Assistant, Duties of Assistant Divisional Engineer (Open Line) ADEN, Duties of SSE/JE (P.Way) Deployed with the Machine, Inspection Schedule of Track Machine Officials, Inspection Schedule of Open Line Officials.

b) Tamping machine and dynamic track stabilizer:

Types of Tamping Machines, Tamping Mechanism, Tamping Parameters, ALC, Lining System, 4 Point Lining Method, Corrections to be Applied in 4 Point Lining Method, Modes of Tamping using 4-Point Lining Method (Only for curves), 3 Point Lining Method, Corrections to be applied in 3- Point Lining, Determination of Target Versine Values for the 3-Point Lining Method, Mode of Tamping using 3-Point Lining Method, Comparison between 3 Point and 4 Point Lining System, Levelling of Track, Mode of working for levelling, General Lift, Input of the Lifting Values, Survey and working of Tamping Machines in Design Mode, Works required Before, During and After Tamping, Working Principle of Dynamic Track Stabilizer, Modes of working of Dynamic Track Stabilizer, Working of DTS.

c) Ballast cleaning and handling machines:

Ballast Cleaning Machines (BCM), Types of Ballast Cleaning Machines, Working Principle and Capability of Ballast Cleaning Machines, Works Required Before, During and After Deployment of Ballast Cleaning Machines.

d) Track relaying machines:

Track Relaying Machines, Working Mechanism and Capability of Track Laying Equipment, Pre-Relaying Operations, Operation During Block, Post Relaying Operations, Working Mechanism of TRT, Operations Prior to Deployment of TRT, Operations During The Block of TRT, Post Block Operations for TRT, Precautions During TRT Working

e) Rail Grinding Machines:

Rail Grinding Machine (RGM) (Purpose & Advantage), Grinding Strategy, Working Parameters of RGM, Monitoring Equipment for Grind Quality, Quality Inspection of Grinding, Preparatory Works for Introduction of RGM, Pre-Block Activity Before Deploying RGM, Operation During RGM Block, Post Grinding Operation.

f) Planning and deployment of Machines:

Pre-requisites for Deployment of Track Machines on Construction Projects/Other Agencies, Minimum Duration of Blocks, Through Tamping and Spot Attention.

g) Rules for movement and block working:

Provision of G&SR, Operation and Working of Track Machine, Competencies of Track Machine Staff, Safety Equipment, Rules for Operation – General, Important Instructions and Precautions (Protection of Work Site, Fouling of Adjacent Lines, Information to Level Crossings etc), Failure and Accidents of Track Machines, Speed Certification for Track Machines, Special Precautions while working in Special Circumstances (Ghat Sections, Night Working)

h) Periodical maintenance and associated infrastructural facility:

Maintenance Schedule for Various Track Machine, Types of Workshops, Functions of Central Periodic Overhauling Workshop (CPOH), Functions of Zonal Machine Depot (ZMD), Functions of Satellite Depot, Functions of Mobile Workshop, Functions of Camping Coach Workshop.

i) Track Machine Manpower

Training (Officers, SSEs/JEs/TM(s), Technical Staff, Machine Assistant), Roster

13. Miscellaneous:**a) Engineering plant:**

Control of plant and machinery, engineering plant reserve, plant register; valuation of plant; maintenance; storage and repairs; requisitioning of plants; use of plant at site; maintenance of log books; hiring out of engineering plant; examination of boilers of the engineering department.

b) Explosives:

Issue of Instructions on use of explosives; observance of rules, carriage of explosives, Protection of trains and Railway property, precautions to be observed

during blasting, Misfire with electrical method of firing, explosives disposal, destruction of explosives

c) Management of Engineering Stores:

Reference to code and Rules; procurement of stores; requisition; receipt and issue of challans; claims of short receipts; etc.; custody of stores - classification, handling and storage, Account head of stores - operation, records and returns; disposal of released and surplus stores - return to stores Depot, disposal by auction; verification of stock and adjustment for shortage/excesses.

d) Law and Order

Railway Police; lodging complaints; cooperation with railway police; cognizable offences; non cognizable offences; powers of arrest by railway staff; warrant against railway staff; action by railway staff in case of attempted sabotage; answering of court summons; Prevention of trespass disposal of human bodies found run over; disposal of cattle found dead on the line.