Note

No./HQ/HR/CADRE/RTI **Dated: 25.04.2025**

RTI-227

Name of the Applicant-Om		
S. No.	**Information Sought**	**Reply**
1.	circular no.29/2021 dated 19.01.2021	Relevant circulars are attached.
2.	circular no.06/2022 dated 09.02.2022	
3.	circular no.1079/2024 dated 20.12.2024	

Ref: No. 2022/HQ/Admin/RTI-227

25/4/25

DGM/HR

GM/HR

AGM/Admin (CPIO)

R71-227

RTI REQUEST DETAILS

Registration No. :	DFCCL/R/E/25/00187	**Date of Receipt :**	31/03/2025
Type of Receipt :	Online Receipt	**Language of Request :**	English
Name :	ram kumar	**Gender :**	Male
Address :	08, ringus, sikar, Pin:332404		
State :	Rajasthan	**Country :**	India
Phone No. :	Details not provided	**Mobile No. :**	Details not provided
Email :	ramkumarga6150@gmail.com		
Status(Rural/Urban) :	Rural	**Education Status :**	Graduate
Is Requester Below Poverty Line ? :	No	**Citizenship Status**	Indian
Amount Paid :	10)	**Mode of Payment**	Payment Gateway
Does it concern the life or Liberty of a Person ? :	No(Normal)	**Request Pertains to :**	

Information Sought :

please provide some circular
1-circular no.29/2021 dated 19.01.2021
2-circular no.06/2022 dated 09.02.2022
3- circular no . 1079/2024 dated 20.12.2024
4-circular no . 646/2020 dated 20.10.2020
5-circular no 20/2024 dated 15.05.2024
5-promotion policy section letter dated 02.02.2024
6-Through which medium the employees were informed before implementing Circular No 36/2023 dated 09/10/2023

Print Save Close

No: HQ-HR0CMER (PFIL)/268/2020-HR-CMER

Date: 19/01/2021

CIRCULAR NO. 29/2021

Sub: Syllabus for the Competitive written examination based on CBT for promotion to N5, E0 and E2 level.

1. This is in supersession of Circular No. 26/2021 dated 15.01.2021.

2. As per revised promotion policy letter No. HR0COPO (HRP)-1/2020-HR-Coord & Policy /100 dated 16.10.2020, written examinations are to be conducted for promotion to N5, E0 and E2 levels.

3. **Syllabus for E0 & E2 level**

The question paper will be divided in two sections as mentioned below:-

Sections	Maximum Marks for each Section (For E0 and E2)
Subject Knowledge (Department Specific)	70%
General topics	30%

4. General topics to be covered for all the departments for **E0 & E2 level** are tabulated below:-

Department	General topics (E0 level)	General Topics (E2 level)
Civil, Electrical, S&T, OP&BD, Mechanical	General English, General Math, General Science, SOP related to concerned department, HR rules like Leave rules, Conduct rules, Gratuity, Welfare schemes of DFCCIL, Advances, Pay & Allowances, Vigilance awareness.	General Math, SOP related to concerned department, HR rules like Leave rules, Conduct rules, Gratuity, Welfare schemes of DFCCIL, Advances, Pay & Allowances, Vigilance awareness.
Finance	SOP related to concerned department, HR rules like Leave rules, Conduct rules, Gratuity, Welfare schemes of DFCCIL, Advances, Pay & Allowances and perquisite entitlement related to policies, Vigilance awareness.	SOP related to concerned department, HR rules like Leave rules, Conduct rules, Gratuity, Welfare schemes of DFCCIL, Advances, Pay & Allowances and perquisite entitlement related to policies, Vigilance awareness.

5. **Syllabus for N5 level**

For N5 category, there will be a common examination for all departments. The question paper will be divided as below:

(2)

Sections	Maximum Marks for each Section (For N5)	Subjects
Section – I	30%	Questions will be from the syllabus of cadre specific on the basis of common training module of MTS (copy attached as Annexure 'A').
Section – II (General topics)	70%	General Knowledge/ Awareness, Arithmetic, General Intelligence and reasoning, General Science and Technical ability.

6. There will be Questions on ' Rajbhasha' for 10% marks and the same will be optional.

7. The detailed syllabus (related to subject knowledge, department wise) for N5 level is enclosed as **Annexure-A** and for E0 & E2 level as **Annexure –B** (for other departments viz Civil, Electrical, S&T, OP&BD, Mechanical & Finance).

8. This issues with the approval of competent authority.

(R. S. Rawat)
Addl. General Manager/HR

Encl: Annexure 'A' and 'B'

Copy for information to:

1. Secy. to MD, for kind information of MD;
2. Director/Finance, Director/Infra, Director/OP&BD and CVO;
3. ED/EDFC, ED/WDFC;
4. All CGMs/GMs/GGMs;
5. Manager/IT-for placing the order on Intranet; and
6. Notice Board.

Annexure-"A" 50

60

38172/2021/HR-CMER

COMMON SYLLABUS FOR COMPETITIVE WRITTEN EXAM FOR PROMOTION TO N5 LEVEL (JR. EXECUTIVE) OF ALL DEPARTMENTS

Scheme of Examination - The computer based test (online mode) will be conducted in two/three sessions on a single day of 2 hours duration. The examination paper will contain questions as under:

SECTION – I	**70% questions will be from the syllabus in conformity with the minimum technical qualification prescribed for the post of Jr. Executive.**

The standard of questions for the online examination will be generally in conformity with the education standards and /or minimum technical qualifications prescribed for the post (Jr. Executive). The question papers will be of Objective Type with Multiple Choice and are likely to include the question pertaining to General Knowledge/Awareness, Arithmetic, General Intelligence and reasoning, General Science and Technical ability. The question paper will have 120 questions.

This will include questions on Rajbhasha @ 10% of total Marks.

SECTION – II	**30 % questions will be from the syllabus of cadre specific on the basis of common training module of MTS as circulated vide HR Note No.HQ/HR/Trg/DR/2018-19(201802246) dated 16.12.2021 (photocopy attached).**

Encl.: As above

(Rajeev Kr. Goyal) GGM/HR	(D.K. Singh) GGM/Civil	(V.B. Mathur) GGM/Sig./CO	(Ravi Bhushan) GM/Elect./TS	(Ved Prakash) GM/OP & CC

Annex-A

COMMON SYLLABUS FOR TRAINING OF MTS OF ALL DEPARTMENTS

DEPARTMENT	CONTENT DESCRIPTION
CIVIL	• Organisation of Engineering Deptt, functions of Engineering Deptt at various levels, Description and Maintenance of P. Way, Description of works, Formation, Ballast • Rails & Joints, Sleepers, Points & Crossings, Welding of Rails, Long Welded Rails, Curves • Ultrasonic Flaw detection of welds and rails, Track Stresses, Track Tolerances, Maintenance, Replacement of points and crossing/thick web switches, Renewals • Machine maintenance, Buildings, Concrete, Water Supply, Sanitation • Schedule of dimensions, FOBs, Trolley Refuses • Precaution during patrolling in between block sections • Rules for use of Motor Trolley/Trollies/Lorries • Screening/packing of Ballast
ELECTRICAL	• Introduction of 25kV and 2x25kV AC traction system, Difference between 1x25kv and 2x25kV system, Major components of 2x25kV system • Basic layout of 2x25kV Traction sub-station, SS & SSP; Major components of TSS/SP/SSP; Protection and relay setting, Different type of relays used for protection, Introduction to operation control centre and SCADA System • Concept of Earthing & bonding; Importance of bonds; Types of bonds in EDFC and WDFC; Safety requirements in electrical system, Clearance as per ACTM, Types of earth pits. Typical earth resistance value for various installations i.e. TSS, SP, SSP, LC Gates, OHE, etc. Public awareness required in electrified territory • Concept of elementary section, LOP, sectioning; Concept of power block, use of discharge rods, safety precautions during blocks; Introduction of SED checking, Tower wagon working; Maintenance schedule and practice of OHE and PSI installations; Non-traction power supply arrangement at station; AT feeding arrangement at station SM room, and in S&T room • Visit of one 2*25 kV commissioned TSS of DFCCIL, discussion reg., OHE arrangement near TSS, power block concept, AT feeding system and precautions etc.
SIGNAL	• Signalling & Telecommunication fundamentals, EI/VDU; Digital Axle Counter; TPWS Components; LED Signals • Point Machine; Power Supply Systems (IPS/UPS); DG Set; Battery; Signalling, Telecom & Power Cables • LC Gate equipment; OFC; GSM-R; Telephone System; VHF/Walkie-Talkie • Procedure for attending S&T failures; Cable Testing & Meggering; Lightning protection, Earthing & Bonding; Location Boxes; Air conditioning of SER, TER/TH
OPERATING	• Introduction of Definitions: Station, Station Section, Station Limit, Facing Point, Trailing Point, VTO, Block section, Signal, Last Stop Signal, Fouling Mark, Train, Line Clear, Shunting, Accident.; Normal Operation of points, Cranking of Points, Clamping of Points, Gap in Points, Points and Trap Point Indicators, Working of Crank Handle, Obstruction in Point; Hand signal: Exhibition of hand signal, Stop hand signal, Proceed hand signal, Proceed with caution hand signal, hand signal for shunting, Train parting; Description and working of fixed signal, Shunt Signals, Gate Signal, Automatic Signalling.

	whistles codes; Method of Shunting, type of shunting and shunting rules, marshalling of trains; Hand brakes on goods and coaching vehicles and their application; Securing of vehicles, including the use of sprags, scotch blocks, chains and wooden sprags; • Coupling of vehicles and wagons, Attachment & Detachment of pressure/hosepipes. Working of line verification box, Ensuring of complete arrival of trains; Reception and dispatch of trains during NI and major failures, piloting of trains; Detonators: Introduction & use, Placement & life of detonators in single line, double nine, in case of any danger, Fog; Knowledge of hot axle, seizure of rolling bearing brake binding, how to remove/release brake binding, hanging parts and it's securing and securing of doors. • Action to be taken in case of accident or unusual occurrence including obstruction of level crossing gates; Level crossing gates – Types, safety equipment of the gate, safety precaution during obstruction on the level crossing gates. Working of sliding booms, normal and abnormal gate working; Knowledge regarding all types of authorities, forms and their use and delivery, precautions to be taken when relief engine is being send in occupied block section, safety equipment; First-aid and fire fighting.
MECHANICAL	• Do's & Don'ts Safety Precautions on duty and during working; Mechanical organisation structure of Railway & DFCCIL and system of operation of DFCCIL; Air Brake testing, brake binding and wagon numbering, CBC coupling and enroute problems; Practical CBC and its working; Practical to familiar of air brake components • Disaster Management, type of Accidents, Rescue & re-failing; Hooter Code, ART Coaches and Wagons & purpose of use; Types of wagon and their components; Tools & their use, Hand Brake and Empty Loaded Device, Hot Axle; Practical training of ART and re-railing equipment; Practical trading of wagons & its components • Types of examination, Types of BPCs, Whistle Code; WILD (WCM), ABD; Guard Driver Check Report; Crew working and role of MTS; Basic fitting with temp. Fasteners and welding etc. wheel defects, rolling in rolling out; Basic practical of nut and bolt, welding and hulk bolts; Practical of rolling and rolling out. • Introduction of Loco and major assemblies/components; Basic loco trouble shooting of under gear, Flasher light, M/L, fire Extinguisher with location and where to keep fire extinguisher and location and where to keep; Securing of Loco and attaching/detaching of locos; Securing dead & live loco; Basic duties of MTS in control (C&W & Loco), lobby and running rooms, Shunting precautions; practical load releasing; Shunting practical; Practical showing serving of authorities.

16/12/2020 16/12/2020 16/12/20 16.12.2020.

93731/2021/O/o GGM/WC-I/DFCC

Syllabus for professional papers for Promotion to Executive E-0 level (CIVIL)in DFCCIL.

Professional Subject **100 Marks**

Railways Engineering -

1. **Railway Survey and Constructions-**
Provision in engineering Code regarding-Classification of Survey, Principles Governing Railway Alignment, Ruling Gradients, Grade Compensation for Curves, Horizontal and Vertical curves, Hill Surveys, Catch Sidings, Tunnels, Preparation of various Maps & Drawings, Preparation of Survey Reports for RECT, PECT and FLS, Project Estimates.

2. **Railway Track-**
Description, Specifications and Function of the Track elements, Rails, Sleepers, Fastening, Ballast, Blanket, Formation (Embankment/Cutting),Drainage System and other and other Sub-structures, Points and Crossings,Geometry and Design features & Track lay-out.

3. **Maintenance of Track-**

(a) **Duties-**Duties of Executive/ Civil & Track.

(b) **Maintenance of Track-**
Method of Maintenance, Manual & Machines Packing, System of Maintenance (conventional and Mechanized), Overhauling, picking up Slacks, Directed Track Maintenance, Miscellaneous works, Lifting and Lowering of Track, Shallow/Deep Screening of Ballast, Maintenance of Drains, Lubrication of Rail Joints, Adjustment of Creep, Maintenance of Level Crossings, Maintenance of Points and Crossing, Maintenance of Track on Bridges.

(c) **Special Maintenance Works-**
Maintenance of Long & Continuous Welded Rails, Maintenance of Switch Expansion Joints and Anti Creep Devices fixed at Turnouts, Maintenance in Electrified Section-Special Precautions, Maintenance of Track Circuited Sections-Special Precautions.

(d) **Design, Maintenance of Curve Track and Realignment of Curves-** Curvature, Transitions, Super-Elevation of Curve, Safe Speed, CantDeficiency, Speed on Curve with Turnouts, Realignments of Curve Method,Extra Clearance on Curve.

(e) **Testing Monitoring of Track with/by Track recording Car**, Frequency of Recording based on Category, OMS Frequency and Category, Interpretation of Track Recording Charts Results and Exception Reports, Analysis of the Charts, TRC Reports to improve Track Parameters, allowable limits of Parameters Category wise, Prioritization of attention to Track Defects etc.

(f) Maintenance and Working of various Track machines.

4. **Maintenance of Bridges-**

(a) Responsibility of the Engineering officials, Action to be taken after inspection of Bridge, Maintenance of foundations, Maintenance of Protection Works and Waterways, Maintenance of Sub-Structures,Maintenance of RCC & PSC Super Structure-Periodical Maintenance, Common Defects andRepair/Strengthening Techniques, Maintenance of Super Structure-Steel Girders- Loss of Camber in steel Girder, Cracks in Steel Work, Strengthening of week Girders, Replacement of Loose Rivets, Maintenanceof HSFG Bolts, Corrosion and its Prevention, Protective Coating by Painting-Periodicity and precautions, Patch Painting, maintenance of Welded Girders, Action taken for Maintenance of Composite Girders, Various defects of Bed Blocks and their Remedies, Bearings, Precautions while carrying out Maintenance works on Bridges.

(b) **Inspection of Bridges-** Inspection of Bridges by Bridge Inspectors (DPM/APM/JPM), periodical Schedule and details of Inspection, Record of Bridge Inspection, Register to be maintained, Certificate of Inspection by (PM/Dy. CPM)-Bridge Inspection Register, Numerical Rating System(NRS), Unique Rating Number, Condition Rating Number,

overall Rating Number, Certificate by (PM/Dy. CPM)

(c) **Details of Inspection of a Bridge-** Flooring and Foundations, masonry inSub-Structure, Under Water Sub-structure inspection, Protective Works and Water ways, Girder Alignment and Seating, Structural Condition of Girders, Track on the Bridge Approaches, Trolley and Safety Refuses, FootPath, Painting, marking HFL and Danger Level, Providing Foundation Particulars and Bridge Name Boards, Flood records at Important Bridges, special Inspection during Monsoon, Equipment required for Inspection of Bridges.

5. **Acquisition, Management and Disposal of Land-**
Ownership of DFCCIL (Railway) LAND, Acquisition of Land, Relinquishment of Railway Land, Verification of Land Boundary, Land Plan, Maintenance of Right of Way, Religious Structure, Management of DFCCIL Land-Leasing, Licencing of land, Encroachment and Responsibility, New Land Acquisition Act 2013.

6. **Maintenance of Buildings and Structures other than Bridges-**
General Instructions, Buildings Register, Maintenance of Buildings, Inspection and Repair, Petty Repair, Books, Periodical inspections, Details of inspections, Maintenance aspects of Cracked Building and Repair tothe existing cracks, Treatment of Leaking roof.

7. **Maintenance of Sanitary and Hygienic Condition in Station Yards and Colonies, Water Supply, Drainage and Sewerages-**

a. **Water supply-**
Source of water supply, Water sample analysis, Pumping capacity, Shallow Tube wells, Deep Tube Wells, Impounding reservoirs, Storage Capacity, Flood discharge, Rainfall registers, High level Storage Tanks, Precaution against Pollution, Pumps-Types, selection, Water supply from outside sources, maintenance and Operation of Water supply, Water supply scheme for Station and colony, Rain Water Harvesting.

b. **Drainage and Sewerage-**
Drainage Systems, Waterborne Sewerage, size of Sewer, surface Drainage- Layout, size of Drain, Disposal of Sullage effluent, Drainage of Latrines, maintenance of Sewerage and Drainage system, Maintenance of open SullageDrain, Strom Water Drain.

8. **Works affecting Railway Safety:**
Reference of Rules, Works requiring Sanction of CRS and Notice thereof, Application to CRS, Execution of works and Safety Certificates, Work resulting from Accidents, Infringement to Schedule of Dimension- Conditions, Procedure thereof, Movement ODCs.
Railway Operation-

a. **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.

b. **Engineering Restrictions and Indicator:**
General- Definitions: Works of short duration, Protection of Line in Block Section and Procedure of Passing trains, Works of long duration, Temporary Engineering Fixed Signals, Arrangement Prior to Commencement of Work, Protection in Block Section for Speed Restrictions, Procedure for Blocking Linesfor Engineering Purposes, Works at time of poor visibility, Temporary Signals in

Emergency, Periodical Notices of Engineering Restrictions, Permanent Speed Restriction indicators, review of Permanent Speed Restriction, Indicators.

c. **Working of Trollies-**
General- Instructions- Rules for working, Certificate of Competency, Official permitted to use Trollies and Lorries, responsibility for Safe Working, Working at Night or in Bad Weather,working on Track Circuited Sections, Conveyance of Non-Railway Officials and Trolley Permits for Private Sidings.

d. **Ballast and Material Trains-**
General- Rules and Working, ordering of Ballast Trains, issue of "Fit to Run" Certificate,

Equipment Testing of Brake Power, Working in Block Section, Running on Ghat Section, Loading and unloading from Hopper Wagons, Planning of Ballast and Material Train Movements, Training out materials and daily reports of Ballast Train Working, Charge of Ballast Train, register of Engineering Vehicles.

9. **Accidents-**
General- Observance of Rules, Duties and Responsibility of the Engineering officials in the event of Accident imparting through Traffic action at Site, Action in case of Derailments, Examination of Site and preparation of Sketches, Recording Track and Rolling Stock Measurements- Restoration through Running Procurement and arrangement of labour and Equipment, Temporary arrangements at Site of Accident, Transhipment, attendance of police at Accidents site, Driver's Reports on defect in Track, Action on receipt of Report of Defective Track, Abnormal occurrence Attributable to Oscillation of Locomotives, Accidents not Impairing through Traffic, records of Accidents.

10. **Rivers & Floods, Pre-Monsoon Precautionary measures & Patrolling ofRailway Line-**

a. **River and Floods-**
General- Behaviour of Rivers, Watchmen at Important Bridges, Pitching stone and Boulder Reserve, Vigilance During Floods, Flood records, River Protection Works, Types, Design, Repairs and Maintenance Records- Rivers and Floods.

b. **Pre-Monsoon Precautionary Measures-**
Vulnerable Sections, Materials for anticipated Emergencies, Monsoon Emergency Rakes, Equipment Tools, Rails Clusters, Temporary Bridge Span, Inspection and Vigilance over Railway affecting Tanks.

c. **Monsoon and Emergency Patrol-**
Kinds of Patrolling, Key Men's daily Patrol, Gang Patrol during Abnormal Rain, Systematic night Patrolling during Monsoon, Stationary Watchmen atVulnerable Points, Review of Patrolling System and Vulnerable locations, Security Patrolling during Civil Disorders, Protection of Line in Emergency, duties of patrolling and their Equipment, Reporting damage and obstructionon Track to Station Masters, Surprise checking at Night.

11. **DFCCIL/Railway Police,** Lodging Complaints, Cooperation with Railway Police, Cognizable offences, Non-Cognizable offences, Action by DFCCIL/Railway Staff in case of attempted Sabotage, Answering of CourtSummons, Prevention of Trespass, Disposal of Human Bodies found Run-Over, Disposal of Cattle found dead on the line.

12. **Track machines-**
(a) Functions and Performance parameter of various Track machines on Indian Railways.
(b) Performance and Quality Parameters in Tamping, Squeezing Pressure, Squeezing Time, Vibration Pressure and Tamping depth.
(c) Rules for movement and Block Working of Track machines.
(d) Minimum Duration of Blocks & Output/Effective Hrs. of Various Track Machines.

Reference: Codes, Manual, Specifications and Acts of Railway and DFCCIL:

(a) **DFCCIL:**
SSOD of Dedicated Freight Corridor, Schedule of Power, HR Manual with latest amendments.

Indian Railway:
Indian Railways P-Way Manual, Indian Railways Works Manual, Indian Railways Bridge manual, Track Machine Manual, USFD Manual and Welding Manual.

Syllabus for professional papers for Promotion to Executive E-0 level in DFCCIL.

Professional Subject **100 Marks**

Civil Engineering (General)

1. **Surveying**

(a) Types

(i) **Chain and Compass survey-**
Basic Principles, Base Line, Cheek Lines, Tick Lines, Perpendicular and Oblique offsets, Conventional Signs, Plotting of survey, True and Magnetic Bearings, Open and Closed Traverses, Recording of traverse, Closing errors.

(ii) Plane Table Survey-
Technique of using Distomat and Total Stations. Method of setting layouts and Curves using these equipment.

(iii) **Levelling-**
Level Lines- Datum, Bench Marks, Simple levelling, Fly Levelling, Recording the levels in Field Book, Method of Reducing Levels, Arithmetical Check, Longitudinal and Cross-Section Contouring.

(iv) **Theodolite Survey-**
Types of Theodolites, Requirement 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.

(v) **Curves-**
Element of Simple Circular Curves, Setting out Simple Circular Curves, Different Methods.

(vi) **Set out Works-**
Setting out Buildings, Culverts, Central Line of Railway Alignment and Usage of GPS Technology in setting out Centre line of Railway Alignment.

(vii) **Care & custody of Survey Instruments:**
Handling of instruments-Transport and Protection, Permanent adjustment, Repair & Periodical overhaul.

2. **Strength of Materials, Structural Designs & Drawings-**

(a) Strength of Materials-
Stress, Strain, Hook's Law, Working Stress, Factor of Safety, Bending Moment and Shear Force in simple supported Beams and Cantilevers, Simple theory of Bending, Moving loads on Simply Supported Beams, influence Lines for Bending Moment and Shear Force in Statically determinate Beams, Short Columns, Long Columns-Empirical Formulae.

(b) Structural Design and Drawings-

(i) **Drawings**- Different Size of paper, folding and Storage of Drawing, Plan, elevation, Sections, Isometric View.

(ii) **RCC Structure-**
RCC-Method of Design, Working Stress Method and Limit State Method, Design of Singly and Doubly Reinforced Rectangular Beams including T & L-Beam, Design of Slabs, Design of Column, IRS Code of Practice for RCC (Concrete Bridge Code), Use of Computer Aided software such as STADD, REM Based Software, Basic requirement for usage of these Software.

3. **Construction Materials**
Description, Specification, Properties and uses of Building materials-Stones, Sand, Timber, Bricks, Cement line, Building Hardware, Paints, Varnishes, Glass, Tiles.

4. **Foundation and Constructions Engineering**
(a) Soil Mechanics-
Different Type of Soil, 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 & Cutting, Guidelines and specification for Design of Formation of Heavy axle Load.
(b) Foundation Engineering-
Function of Foundations, Different types of Foundations-Open, Well & Pile Foundations, Determination of Safe Bearing Capacity, Stress & Settlement analysis, Method of reducing different settlements.
(c) Buildings-
Brick and Stone Masonry, construction details-roofs, Floors, staircases, Joinery, Scaffolding, Damp Proof Course, Green Building.
(d) Types of Cracks in Building- causes and Preventive and Remedial Technique for avoiding Cracks in building.

5. **Hydraulics & Hydrology-**
(a) Hydrology- Rainfall and Run-off, Rainfall Statics, Rain Gauges, Run-off Calculations by Empirical methods, Flood discharge estimation, Measurement of flood discharge-Current meter.
(b) Hydraulics -
Elements of Hydraulics- Open Channel Flow, flow in pipes, Frictional Loss, Empirical Formulae.

6. **Public Health Engineering**
(a) Water Supply-
(a) Standard of Quality of Drinking Water-Physical, Chemical and Bacteriological Standard of Water, Water Born Diseases, Water Demand-Method of Forecasting, Method of Treatment of Water-Aeration, Sedimentation, Filtration(Slow and Rapid Sand Filters), Disinfection, Hardness- Method of removal.
(b) Conveyance and Distribution
(i) Preparation of Schemes for New Water Supply/Augmentation of Existing Water Supply, Estimating Requirement of Water, Types, Selection and installation of Pumps, Capacity of Pumping, Conveyance of Water, Rising Mains, System of Distribution, Residual Pressure, Different Types of Pipes and Fittings, Testing of Pipes, Laying of Pipes and Fitting of Valves and Meter, Storage Tanks,

Capacity, Maintenance and Cleaning of Storage Tanks, Water Supply Plan.

(ii) Planning and Design of Layout for Rain Water Drain, Principles of Rain Water Harvesting Methods, Estimation of Capacity of Rain-Water Harvesting Pits/Salient etc.

(iii) Water Audit and Water Management-
Conservation of Water, Water Reuse, Water Recycling, Water Recycling Plant, Flow Measurement System, Identification of Losses and Leakages.

(c) Sewerage-
Preparation of Schemes of Sewerage, Sewerage & Waste Water-Collection and Carriage, Design of Sewers, House Connections, Storm Water Drains, Disposal of Sewerage-River Pollution and Control, sewerage Treatment, Land irrigation, septic Tanks, Primary Clarifier, Sludge and Scum removal, Tricking Filters, Activated Sludge process, Sludge Digesting Principles of Anaerobic Digestion, Sludge Gas, Sludge Drying and Disposal.

B. Civil Engineering (Railways)-

1. **Railway Survey and Constructions-**
Provision in engineering Code regarding-Classification of Survey, 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 & Drawings, Preparation of Survey Reports for RECT, PECT and FLS, Project Estimates.

2. **Railway Track-**
Description, Specifications and Function of the Structure Elements, Rails, Sleepers, Fastening, Ballast, Blanket, Formation (Embankment/Cutting), Drainage System and other and other Sub-structures, Points and Crossings, Geometry and Design features & Track lay-out.

3. **Maintenance of Permanent Way-**

(a) Duties-
Duties of officials of Engineering Department as per IRPWM.

(b) Maintenance of Permanent Way-
Method of Maintenance, Beater Packing, Measured Shovel Packing, Machines Packing, System of Maintenance (conventional and Mechanized), Overhauling, Systematic Through Packing, Picking up Slacks, Directed Track Maintenance, Miscellaneous works, Lifting and Lowering of Track, Shallow/Deep Screening of Ballast, Maintenance of Drains, Lubrication of Rail Joints, Adjustment of Creep, Maintenance of Level Crossings, Maintenance of Points and Crossing, Maintenance of Track on Bridges.

(c) Special Maintenance Works-
Maintenance of Short welded Rails, Long & Continuous Welded Rails, Maintenance of Switch Expansion Joints, Maintenance in Electrified Section-Special Precautions, Maintenance of Track Circuited Sections-Special Precautions.

(d) Design, Maintenance of Curve Track and Realignment of Curves-
Curvature, Transitions, Super-Elevation of Curve, Safe Speed, Cant Deficiency, Speed on Curve with Turnouts, Realignments of Curve Method, Extra Clearance on Curve.

(e) Testing Monitoring of Track with/by Track recording Car, Frequency of Recording based on Category, OMS Frequency and Category, Interpretation of Track Recording Charts Results and Exception Reports, Analysis of the Charts, TRC Reports to improve Track Parameters, The allowable limits of Parameters Category wise, Prioritization of attention to Track Defects etc.

(f) Heavy Axle Traffic and Different Types, Precautions and Checks to ensure Safety of Track and Bridges.

(g) Maintenance and Working of various Track machines.

(h) Formation treatment works for Railway Embankment-Various Methods and their Advantages and Disadvantages of the method.

4. **Maintenance of Bridges-**

(a) Responsibility of the Engineering officials, Action to be taken after inspection of Bridge, Maintenance of foundations, Maintenance of Protection Works and Waterways, Maintenance of Sub-Structures-Abutment, Pier, Wing walls and Return walls, Cement pressure Grouting, Epoxy Grouting, Shotcreting/Guniting, Maintenance of RCC & PSC Super Structure-Periodical Maintenance, Common Defects and Repair/Strengthening Techniques, Maintenance of Super Structure-Steel Girders- Loss of Camber in steel Girder, Cracks in Steel Work, Strengthening of week Girders, Replacement of Loose Rivets, Maintenance of HSFG Bolts, Corrosion and its Prevention, Protective Coating by Painting-Periodicity and precautions, Patch Painting, Ordinary Paints, maintenance of Welded Girders, Action taken for Maintenance of Composite Girders, Various defects of Bed Blocks and their Remedies, Bearings, Precautions while carrying out Maintenance works on Bridges. Records of inspection, Details of Bridge Inspections, Works connected with maintenance of Bridges, laying of Bridge Sleepers, replacing Crack Bed blocks, painting of steel works, Bridge Bearing.

(b) **Inspection of Bridges-** Classification of Bridges-Major, Minor, Important, Inspection of Bridges by Bridge Inspectors (DPM/APM/JPM), periodical Schedule and details of Inspection, Record of Bridge Inspection, Register to be maintained, Certificate of Inspection by (PM/Dy. CPM)-Bridge Inspection Register, Numerical Rating System(NRS), Unique Rating Number, Condition Rating Number, overall Rating Number, Certificate by (PM/Dy. CPM)

(c) **Details of Inspection of a Bridge-** Flooring and Foundations, masonry in Sub-Structure, Under Water Sub-structure inspection, Protective Works and Water ways, Girder Alignment and Seating, Structural Condition of Girders, Track on the Bridge Approaches, Trolley and Safety Refuses, Foot Path, Painting, marking HFL and Danger Level, Providing Foundation Particulars and Bridge Name Boards, Flood records at Important Bridges, special Inspection during Monsoon, Equipment required for Inspection of Bridges.

5. **Acquisition, Management and Disposal of Land-**

General Code/Manual Rule

Ownership of DFCCIL (Railway) LAND, Sanctioning authority for Acquisition and Relinquishment, Principle 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 DFCCIL Land Boundary, Land Plan etc., Maintenance of Right of Way, Religious Structure, Management of DFCCIL Land-Leasing, Licencing of land, Way lease facility and easement Right, Encroachment and Responsibility_ Rules of Permission for Construction of Building near DFCCIL land, Instruction regarding Cutting/Trimming and sale of Natural Product Like mature Tree, Dry tree within and outside DFCCIL Land Boundary, Sale of grass etc.

6. **Maintenance of Buildings and Structures other than Bridges-**
   General Instructions, Additions and Alterations to Quarters, Transfer of buildings, Buildings Register, Vacant Railway Buildings, Maintenance of Buildings, Inspection and Repair, Petty Repair, Books, Periodical inspections, Details of inspections, Maintenance aspects of Cracked Building and Repair to the existing cracks, Treatment of Leaking roof.
7. **Maintenance of Sanitary and Hygienic Condition in Station Yards and Railway Colonies, Water Supply, Drainage and Sewerages-**
   (a) **Sanitation-**
   Cleaning of wells, Disinfections-Prevention of Infectious Diseases, disinfection of Quarters.
   (b) **Water supply-**
   Source of water supply, Water sample analysis, Open Well-sizes, Pumping capacity, improving yield, Shallow Tube wells, Deep Tube Wells, Impounding reservoirs, Storage Capacity, Flood discharge, Record of water Level in Wells, Rainfall registers, High level Storage Tanks, Precaution against Pollution, Pumps-Types, selection, Installation, Aqueduct and pipelines types, Selection, Laying, estimating, requirement of water, Layout of distribution systems, Water supply from outside sources, maintenance and Operation of Water supply, Water supply scheme for Station and colony, Rain Water Harvesting.
   (c) **Drainage and Sewerage-**
   Drainage Systems, Waterborne Sewerage, size of Sewer, Sewage Treatment system, Sewage Disposals, Sewage Purification System, surface Drainage-Layout, size of Drain, Disposal of Sullage effluent, Drainage of Latrines, maintenance of Sewerage and Drainage system, Maintenance of open Sullage Drain, Strom Water Drain.
8. **Works affecting Railway Safety and Opening of New Works:**
   Reference of Rules, Works requiring Sanction of CRS and Notice thereof, Application to CRS, Execution of works and Safety Certificates, Documents to accompany application, Submission of Safety Certificate, Work resulting from Accidents, Opening of New Lines, Infringement to Schedule of Dimension-Conditions, Procedure thereof, Movement ODCs-Types and procedure for Sanction for Movement, Precaution during Movement.
9. **Railway Operation-**
   (a) **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.
   (b) **Engineering Restrictions and Indicator:**
   General- Definitions: Works of short duration, Protection of Line in Block Section and Procedure of Passing trains, Works of long duration, Temporary Engineering Fixed Signals, Arrangement Prior to Commencement of Work, Protection in Block Section for Speed Restrictions, Procedure for Blocking Lines for Engineering Purposes, Works at time of poor visibility, Temporary Signals in

Emergency, Periodical Notices of Engineering Restrictions, Permanent Speed Restriction indicators, review of Permanent Speed Restriction, Indicators.

(c) Working of Trollies-

General- Instructions- Rules for working, Distinction between Trollies, Lorries and Motor Trollies, Certificate of Competency, Official permitted to use Trollies and Lorries, responsibility for Safe Working, Working at Night or in Bad Weather, working on Track Circuited Sections, Conveyance of Non-Railway Officials and Trolley Permits for Private Sidings. Protection, Trolley Refuses, Equipment on Trollies and Lorries, Working of Trollies and Lorries in Block Sections, in Station Yard.

(d) Ballast and Material Trains-

(e) General- Rules and Working, restriction in running, ordering of Ballast Trains, issue of "Fit to Run" Certificate, Equipment Testing of Brake Power, Working in Block Section, Running on Ghat Section, Loading and unloading from Hopper Wagons, Planning of Ballast and Material Train Movements, Training out materials and daily reports of Ballast Train Working, Charge of Ballast Train, register of Engineering Vehicles.

10. Accidents-

General- Observance of Rules, Intimation of Accidents by Station masters, Duties and Responsibility of the Engineering officials in the event of Accident imparting through Traffic action at Site, Reporting details of Accident-Provision of Accident Manual, Action in case of Derailments, Examination of Site and preparation of Sketches, Recording Track and Rolling Stock Measurements-Accident Procedure, Use of recorded data, Restoration through Running Procurement and arrangement of labour and Equipment, Temporary arrangements at Site of Accident, Transhipment, Funds required during Emergencies, attendance of police at Accidents site, Driver's Reports on defect in Track, Action on receipt of Report of Defective Track, Abnormal occurrence Attributable to Oscillation of Locomotives, Accidents not Impairing through Traffic, records of Accidents.

11. Rivers & Floods, Pre-Monsoon Precautionary measures and Patrolling of Railway Line-

(a) River and Floods-

General- Behaviour of Rivers, Watchmen at Important Bridges, Pitching stone and Boulder Reserve, Vigilance During Floods, Flood records, Survey of Course of River, River Protection Works, Types, Design, Repairs and Maintenance Records- Rivers and Floods.

(b) Pre-Monsoon Precautionary Measures-

Vulnerable Sections, Materials for anticipated Emergencies, Monsoon Emergency Rakes, Equipment Tools, Rails Clusters, Temporary Bridge Span, Protective Works Railway effecting Tanks, Inspection and Vigilance over Railway affecting Tanks, Pre-Monsoon, During Monsoon.

(c) Monsoon and Emergency Patrol-

Kinds of Patrolling, Key Men's daily Patrol, Gang Patrol during Abnormal Rain, Systematic night Patrolling during Monsoon, Stationary Watchmen at Vulnerable Points, Review of Patrolling System and Vulnerable locations, Security Patrolling during Civil Disorders, Protection of Line in Emergency, duties of patrolling and their Equipment, Reporting damage and obstruction on Track to Station Masters, Check Over Patrolling, Inspection of Equipment, Surprise checking at Night.

9. **Miscellaneous-**

(a) Engineering Plant-

General- Code rules, Engineering Plant Reserve, Plant Register, Valuation of Plant, Maintenance, Storage and Repairs, Requisitioning of Plant, Use of Plant at Site, Maintenance of Log books.

(b) Explosives-

General- Issue of Instructions on use of Explosives, Observance of Rule Carriage of Explosive, Commonly used Explosives, Selection of Explosives, Storage and Conveyance to Works Site, Ballasting Operation, Boring Holes, Amount of Charge, Ballasting Misfires, Protection to Trains and Railway Property, Destruction of Explosives, Detonating Signals-Care and Custody, use of Detonators and test.

(c) Management of Engineering Stores-

General- Reference to Code Rules, Procurement of Stores, Requisition acknowledgement of receipt claim for short receipts etc., Custody of Stores-Classification, handling and Storage, Account Heads of Stores, Operation, records and Returns, Disposal of released and Surplus Stores-Return to Store Depot, Disposal by Auction, verification of Stocks and adjustment for Storage/Excesses.

(d) Law and Order-

DFCCIL/Railway Police, Lodging Complaints, Cooperation with Railway Police, Cognizable offences, Non-Cognizable offences, Power of Arrest by Railway/DFCCIL Staff, Warrant against DFCCIL/Railway Staff, Action by DFCCIL/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.

11. **Track machines-**

(i) Provision of Indian Railway Track machines Manual.

(j) Working Principles and Performance parameter of various Track machines on Indian Railways.

(k) Controls and Working Systems of Various Track machines.

(l) Working of Tamping Machine in Design Mode.

(m) Performance and Quality Parameters in Tamping, Squeezing Pressure, Squeezing Time, Vibration Pressure and Tamping depth.

(n) Maintenance schedule of various track machines.

(o) Troubleshooting.

(p) Rules for movement and Working of Track machines.

(q) Type of Small Track Machines required for Maintenance of Track and their maintenance system.

10. **Codes, Manual, Specifications and Acts of Railway and DFCCIL-**

(a) DFCCIL SSOD of Freight Corridor, Works Manual of DFCCIL, Quality Manual of DFCCIL, Manual of office Procedure, Schedule of Power, SHE Manual.

(b) Indian Railway- IRPWM, Engineering Code, IRWM, IR Bridge manual, Ballast Specification, Rule of Operating of Railway Line, LWR Manual and USFD Manual.

(c) RDSO- Concrete Bridge Code, GE-144

(d) General- Indian Railway Act, RAA2008 with latest amendments, Labour Acts Etc.

Syllabus for Promotion to E2 level in Mechanical Department

1. Elementary Knowledge of Internal Combustion Engines, Heat Recovery, Thermal Efficiency, Supercharging & Inter cooling.
2. Various Engineering materials and their properties, Bearings, Stress & stress & strain, Fatigue hardness, Corrosion & surface finish.
3. General responsibilities, Organisation and Functions of Mech. Engg. Dept.
4. Different types of wagons in use on Railways and components like Couplers, Brake Gear, Air Brake system (single pipe & twin pipe), roller bearings, etc.
5. Maintenance pattern of freight trains including CC rakes
6. Various tools and equipments related to wagon maintenance/disaster management
7. Prevention of hot box, train parting, brake binding etc.
8. Disaster Management – Accident Classification, duties of first official to reach accident site and duties of supervisor in case of accident, ART ordering, causes of accidents and their prevention, accident enquiry, existing disaster management policy, class of ART, Mock drills,
9. Working of OMRS, WILD, ABD
10. Quality improvement in Work area; items to be inspected at workplace.
11. Safe practices and precautions to be observed while working in the field/shop.
12. Health & Safety standards in shops sheds & depots
13. Power Plan, Engine Utilization, Crew Planning, Running rooms & crew lobby management
14. Running staff training, Drivers Grading System.

Syllabus for Written Examination for Promotion from E0/E1 level to E2 Level (Electrical)

1. OHE:

- Concept of 25 KV AC Traction system of Railways
- Concept of 2*25 KV AC traction system of DFCCIL
- Difference between 1*25 KV and 2*25 KV system
- Major components of 2*25 KV system i.e Different type of Masts, portals, Insulators, section insulators, Catenary, Contact wire, Cantilever assembly, droppers , ATD, Foundation, neutral section etc.

2. Substation:

- Basic lay out of 2*25 KV Traction sub-station, SP and SSP
- Major components of TSS/SP/SSP i.e Power transformer, Auxiliary Transformer, Circuit breaker, isolators, Panels, Capacitance bank etc
- Protection and relay setting, Different type of relays used for protection.
- Introduction to Operation Control Centre and SCADA system

3. Earthing, Bonding and electrical safety:

- Concept of Earthing& Bonding.
- importance of bonds
- Types of bonds in EDFC and WDFC
- Safety requirements in electrical system. Earthing of equipment's as per IE rule,
- clearances as per ACTM
- Types of earth pits. Typical earth resistance value for various installations i.e TSS, SP, SSP, LC gates, OHE, etc
- Public awareness required in electrified territory.

4.Maintenance:

- Concept of elementary section, LOP, sectioning,
- Concept of power block, use of discharge rods, safety precautions during blocks.
- Introduction to SED checking. Tower wagon working
- Maintenance schedule and practices of OHE and PSI installations.

5. Non-Traction power supply:

- Non-Traction power supply arrangement at station including 11KV Substation
- AT feeding arrangement at station SM room, and in S&T rooms at station and in section.
- Lighting at station and other locations.

- General Power Supply installation testing and commissioning, heat load calculations, installation of AC and its maintenance.

6. **Locomotive and its Operation:**

General overview of Electric and Diesel Locomotive, basic knowledge of loco operation related items/parts, Loco Operation, Basics of Power Supply system of Elect. & Diesel Locomotive.

7. **Electrical Engineering Materials:**

- Conductor materials. Factors affecting Resistivity, Temperature effect on resistance of different materials, conductivity of wires, cables material alloys, carbon and graphite.
- General properties of insulating materials, factors affecting insulating properties such as moisture etc. Ingress protection class.
- Magnetic Materials: Ferro-magnetic elements and their alloys for magnetic uses, non-magnetic uses, non-magnetic alloys, B.H. Curves, Hysteresis and Eddy current losses.

8. **Theory and performance of electrical machine and equipment's:**

- Electro-magnetic and Electrical Fields, various, Laws, Maxwell's Equations, AC & DC EMF equations and circuits.
- **Direct Current Machines:** Generation of work power, EMF and Torque equations, Armature winding, armature reaction, theory of communication, interpoles and compensating windings, characteristics of shunt, series and compound generators, parallel running and loads sharing of generators, load characteristics of shunt, series & compound motors, speed control of motors, testing of generators and motors including their efficiency.
- **Alternators:**Theory and constructions, effect of form factor and coil pith factor, Armature reaction and leakage reactance, synchronous impedance, synchronizing, Parallel Operation, regulation, etc.
- **Synchronous Motors:** Current and power (curves) locos diagram, Hunting effect of prime mover on parallel running, effects of variation in excitation, etc.
- **Induction Motors:** Theory of squirrel cage and slip-ring motors, torque, slip curves circle diagram, stator and rotor resistance, starting torque induction generator, starting method testing, Torque-speed characteristics.
- **Transformers** : Mutual induction, equivalent circuit of transformer, vector diagram, regulation, methods of cooling, tap changing, parallel operation, polarity and phase sequence parallel operation, Testing, Protection Instrument PTs & CTs, etc.
- AC & DC Power supply, Rectifiers, DC-DC Converter, Inverter.

9. **Generation, Transmission and Distribution:**

- Sources of energy, heat value of fuels, Thermal power stations hydro-electric stations, nuclear power station, relative advantages of various modes of generations, Non-conventional source of Energy-solar cell, wind mill & energy, etc.

- Low voltage DC distribution, three wire systems, radial and ring system, balances and boosters, advantages of high voltage transmission. AC Transmission, overhead lines, electrical designers, sag-tension calculations, guards, vibration, resistance, inductance and capacitance of overhead lines, corona discharge, insulators and voltage distribution, underground cables, insulation resistance, capacitances, sheath effect, thermal characteristics, fault location, XLPE cable, lighting arrester & circuit breaks, SCADA, etc.
- Voltage regulations, short circuit-symmetrical and asymmetrical compounds, protection of switch gear by factors, rating of circuit breakers, fuses and protective relays, including microprocessor/numerical bases relays.
- Illumination standard of light, polar curve, reflection and absorption, lighting calculators, including design & economical layout of service buildings, workshops & years, various sources of light, fluorescent tubes, CFL, energy efficient buildings design.

10. Measurements and Instrumentation:

- Measurement of Resistance (high and low), Potentiometer, Wheat stone and Kelvin bridge, Meggers for insulation resistances and earth resistance.
- Voltmeters, Ammeters, PA meters, Single-Phase watt matter, measurement of three phase power recording instruments.
- Watt hour meter, Clock meter, Maximum Demand, TOD meters.
- Thermocouple, pyrometers, digital indicating instruments, specification accuracy, etc.
- Tan delta test, Polarisation test, Dielectric constant & Transducers.

11. Mechanical Engineering, Air Conditioning & Refrigeration

- Various types of drives, Belt, rope and chain drive toothed gearing ball and roller bearing, tapered roller bearings.
- Working of two stroke and 4-stroke petrol engine, diesel engines.
- Refrigeration cycle, Dry Bulb/Wet bulb temperature measurement etc.

12. Administration Related:

Organizational structure of DFCCIL at various levels, Main Provisions of DFCCIL/Railway Conduct Rules, Discipline & Appeal rules (D&A rules), Different types of Charge sheets and Punishment action under each one of them (Standard Forms).

13. Rules & Manuals-

DFCC G&SR, IR Signal Engineering Manual, IR Telecommunication Manual, IR AC Traction Manual, IR P-Way Manual, DFCC Block Working Manual, DFCC Schedule of Dimensions, DFCC Operation Manual, DFCC Works Manual, Disaster Management, DFCC Accident Manual, Rules for Opening of Railways, Accident/ Breakdown/Failure Reporting Communication with respective Control room, Failure

Investigation/Joint report making, Station Working Rules (SWR), National Building Code, ECBC Code, GRIHA.

14. **I.E Rules:** C.E.A (Central Electricity Authority) Safety Regulations 2010.

15. **General**

Heat, Temperature & Work, Expansion of solids, liquid & gases.

Simple motors & Dynamos, Principle of working of Transformer, Relay, Fuse, Circuit breaker.

AC & DC Power supply, Rectifiers, DC-DC Converter, Inverter.

Syllabus for the employee for promotion Junior Manager/OP&BD (E-2 Level)

1. Objectives of DFCCIL and function of OP & BD Department.
2. Organizational structure of DFCCIL in Corporate Office and Corridor HQ.
3. Fundamental Design Parameters/ features, Scheduled Dimensions of DFCCIL in Compression to IR.
4. Rules applying to Company employees generally.
5. Type of signals and their aspects.
6. Station working rule and its appendix.
7. Absolute Block System & Automatic Block System (in detail).
8. Operating authorities/ Forms and their use.
9. Working of Trollies/ Motor Trollies/ Lorries, Tower wagons and other machines.
10. ODC (Over Dimensional Consignment).
11. Definition of unusual, accident, serious accidents and classifications of accident & duties of supervisor reaching first at accident site.
12. Short notes – EOTT, TPWS, TAC, EI, CMS, Line verification Box (LVB), FOIS, TMS, Data logger, MSDAC (Multi Section Digital Axle Counter), HOER, Approach warning & approach locking system at LC gates. Modified Automatic Block signaling system (MABS), FSD (Fog safe device), and Neutral section, Sigma Board, VTO as mentioned in DFCR.G8SR, Anemometer, IMD & IMSD, and SCADA.
13. Abnormal train working as mentioned in chapter-IX of DFCR G&SR.
14. Train operation during N.1, major failure, heavy wind storm.
15. Difference between Goods Shed, PFT, MMLP, Green field, Brown field.
16. Precautions to be taken in Electrified section, procedure for granting Power Block.
17. Items to be checked during detail inspection of station, footplate inspection.
18. Procedure for Resetting of Axle counter.

19. Goods Booking

(i) Registration of wagons, restriction message, Routing and rating of Goods Traffic. Forfeiture and refund of wagon registration fees. Priority schedule, re-weightment, re-booking and diversion, booking and delivery of Goods.

(ii) Siding, MMLP and PFT policy of DFCCIL

(iii) Important section of Railway Act.

(iv) Delivery of Goods, wharefage & demurrage.

(v) Handling of container traffic.

(vi) Preferential Schedule.

(vii) Marketing skills for Incremental/New Goods Traffic on DFCR.

Syllabus for Written Exam for promotion from Sr. Executive(E1) to JM/JPM (S&T) (E2)

1. **General**

   Heat, Temperature & Work, Expansion of solids, liquid & gases.

   Simple motors & Dynamos, Principle of working of Transformer, Relay, Fuse, Circuit breaker.

   AC & DC Power supply, Rectifiers, DC-DC Converter, Inverter.

2. **Fundamental Engineering & Applied Technology-**

   Magnetism, Electricity, Sound, Electrical Machinery and Circuits, Fundamental Electronics & Electronic Circuits, Power Supply Equipment and Systems, Protection Systems against Lightning & Surges, Principles of Optics & Optical Fibre Cable, Principles of Digital Electronics, Boolean Algebra, Digital Devices and their Applications, Data Communications Principles & Information Technology, Basic LAN/WAN & Networking, Intranet/internet.

3. **Rules & Manuals-**

   DFCC G&SR, IR Signal Engineering Manual, IR Telecommunication Manual, IR AC Traction Manual, IR P-Way Manual, DFCC Block Working Manual, DFCC Schedule of Dimensions, DFCC Operation Manual, DFCC Works Manual, Disaster Management, DFCC Accident Manual, Rules for Opening of Railways.

4. **Signalling-**

   Basic Concepts of Signalling, Principles of Interlocking, Selection Circuits & Control Table, Signalling-Relays & Cables, DC Track Circuit, Axle Counters, Colour Light & Automatic Signalling, Electrical Point Machine, Block Signalling (Block Proving by Axle Counter using UFSBI), British Interlocking with Metal to Carbon Relays, Signalling in 25 KV RE Section, Power supply arrangements for Signalling, Electronic Interlocking (EI), Datalogger, Train Protection & Warning System (TPWS), European Train Control System (ETCS), Intermediate Block Signalling (IBS), LC Gate, DG Set, Failure Analysis & Investigations.

5. **Telecommunication-**

   Train Traffic Control, Plesiochronous Digital Hierarchy (PDH), Synchronous Digital Hierarchy (SDH), Optical Fibre Communication (OFC), VHF Communications, Mobile Train Radio Communication (MTRC)/GSM-R, WPC Clearance, Underground cable system, DWDM, Communication in RE area, Data communication & IP Networks, Digital Electronic Exchanges, ISDN, Network Management Systems, Networks for FOIS, TMS etc, Concept of GPS, 48V DC SMPS Power Supply.

Syllabus for CBT exam for promotion to the post of E-02 Junior Manager & E-0 (Executive) in Finance Department.

1.0 Syllabus:

1.1 Professional Knowledge : Candidates are required to possess reasonable professional knowledge in all the areas applicable to Finance Officers broadly categorized as under:

(i) Accountancy
(ii) Taxation
(iii) Financial Management
(iv) Auditing
(v) Banking and funds management

1.2 Accountancy: Generally Accepted Accounting Principles, Accounting and IND AS Standards, Principles of Accounting and Commercial Book keeping, Trial Balance, Annual Accounts, Depreciation, Provisions, Classification and Structure of DFCCIL Accounts. Preparation of Financial Statements i.e. Statement of Profit & Loss, Balance sheet etc.

1.3 Taxation: Income Tax Laws & Indirect Tax Laws i.e. GST, Compliance requirements.

1.4 Financial Management: Equity, Debt, PPP, Capital structure, Cost of Capital and Investment Analysis through various methods like Payback period, NPV, IRR etc., Budgeting (Railway Budgeting and DFCCIL Budgeting), Features of JICA and World Bank loans, Ratio Analysis, Fund Flow Statement.

1.5 Auditing: Internal Auditing and External Auditing (Statutory Audit and CAG Audit), Methods and Process of audit, Pre-Audit and Post-Audit, Financial Vetting and Scrutiny, System Auditing, Land Auditing.

1.6 Banking and funds management: Opening of Accounts in Banks, maintenance of stock of Cheque book, NEFT process, Deposit of receipts in Banks, handling of Money value instruments like FDRs, BGs, etc. Bank Reconciliation Statement, Funds Flow between Corporate Office and Field Units, Management of Surplus Funds, Management of SLAO accounts.

1.7 Working Knowledge on DFCCIL: The proposed examination being Departmental exam for promotion, candidates are also expected to possess reasonable knowledge of Working Rules and Procedures within DFCCIL. A separate section with questions will be on working rules and procedure, which may broadly include knowledge of DFCCIL's :

(i) Schedule of Powers
(ii) DFCCIL all Accounting Manuals
(iii) DFCCIL Works Manual & Procurement Guidelines

डेडीकेटेड फ्रेट कोरीडोर

डेडीकेटेड फ्रेट कोरीडोर कार्पोरेशन ऑफ़ इंडिया लि.

Dedicated Freight Corridor Corporation of India Limited

(भारत सरकार का उपक्रम)

5th Floor, Supreme Court Metro Station Building Complex, New Delhi -110001

No. HQ/HR0CMER (PFIL)/268/2020-HR-CMER **Date: 09/02/2022.**

CIRCULAR NO. 06/2022

Sub: **Syllabus for the Competitive written examination based on CBT for promotion to N5, E0 and E2 level in Civil Department.**

Ref.: Circular No.29/2021 dated: 19.01.2021

In continuation of Circular No. 29/2021 dated 19.01.2021, CBT examination are to be conducted for promotion to N5, E0 and E2 levels.

The **Syllabus for E0 & E2 level in Civil Department is as under:**

Sections	**Maximum Marks for each section (For E0 and E2)**
Subject knowledge (Department Specific)	70%
General topics	30%

2. The revised syllabus related to subject knowledge for Civil Department is enclosed as E0 & E2 level as Annexure – A & B.

3. The remaining contents of the Circular No. 29/2021 dated 19.01.2021 remained unchanged.

4. This issues with the approval of Competent Authority.

9/2/2022

(Sunder Singh)
General Manager/HR-II

Encl: Annexure 'A' & 'B'

Copy for information to:

1. Secy. to MD for kind information of MD;
2. Director/Infra, Director/OP& BD, Director/Finance, Director/PP and CVO;
3. All EDs;
4. All GGMs/GMs/CGMs;
5. Manager/IT-for placing the order on Intranet;
6. Notice Board.

93731/2021/O/o GGM/WC-I/DFCC

Syllabus for professional papers for Promotion to Executive E-0 level (CIVIL)in DFCCIL.

Professional Subject **100 Marks**

Railways Engineering -

1. Railway Survey and Constructions-

Provision in engineering Code regarding-Classification of Survey, Principles Governing Railway Alignment, Ruling Gradients, Grade Compensation for Curves, Horizontal and Vertical curves, Hill Surveys, Catch Sidings, Tunnels, Preparation of various Maps & Drawings, Preparation of Survey Reports for RECT, PECT and FLS, Project Estimates.

2. Railway Track-

Description, Specifications and Function of the Track elements, Rails, Sleepers, Fastening, Ballast, Blanket, Formation (Embankment/Cutting),Drainage System and other and other Sub-structures, Points and Crossings,Geometry and Design features & Track lay-out.

3. Maintenance of Track-

(a) Duties-Duties of Executive/ Civil & Track.

(b) Maintenance of Track-

Method of Maintenance, Manual & Machines Packing, System of Maintenance (conventional and Mechanized), Overhauling, picking up Slacks, Directed Track Maintenance, Miscellaneous works, Lifting and Lowering of Track, Shallow/Deep Screening of Ballast, Maintenance of Drains, Lubrication of Rail Joints, Adjustment of Creep, Maintenance of Level Crossings, Maintenance of Points and Crossing, Maintenance of Track on Bridges.

(c) Special Maintenance Works-

Maintenance of Long & Continuous Welded Rails, Maintenance of Switch Expansion Joints and Anti Creep Devices fixed at Turnouts, Maintenance in Electrified Section-Special Precautions, Maintenance of Track Circuited Sections-Special Precautions.

(d) Design, Maintenance of Curve Track and Realignment of Curves- Curvature, Transitions, Super-Elevation of Curve, Safe Speed, CantDeficiency, Speed on Curve with Turnouts, Realignments of Curve Method,Extra Clearance on Curve.

(e) Testing Monitoring of Track with/by Track recording Car, Frequency of Recording based on Category, OMS Frequency and Category, Interpretation of Track Recording Charts Results and Exception Reports, Analysis of the Charts, TRC Reports to improve Track Parameters, allowable limits of Parameters Category wise, Prioritization of attention to Track Defects etc.

(f) Maintenance and Working of various Track machines.

4. Maintenance of Bridges-

(a) Responsibility of the Engineering officials, Action to be taken after inspection of Bridge, Maintenance of foundations, Maintenance of Protection Works and Waterways, Maintenance of Sub-Structures,Maintenance of RCC & PSC Super Structure-Periodical Maintenance, Common Defects andRepair/Strengthening Techniques, Maintenance of Super Structure-Steel Girders- Loss of Camber in steel Girder, Cracks in Steel Work, Strengthening of week Girders, Replacement of Loose Rivets, Maintenanceof HSFG Bolts, Corrosion and its Prevention, Protective Coating by Painting-Periodicity and precautions, Patch Painting, maintenance of Welded Girders, Action taken for Maintenance of Composite Girders, Various defects of Bed Blocks and their Remedies, Bearings, Precautions while carrying out Maintenance works on Bridges.

(b) Inspection of Bridges- Inspection of Bridges by Bridge Inspectors (DPM/APM/JPM), periodical Schedule and details of Inspection, Record of Bridge Inspection, Register to be maintained, Certificate of Inspection by (PM/Dy. CPM)-Bridge Inspection Register, Numerical Rating System(NRS), Unique Rating Number, Condition Rating Number,

overall Rating Number, Certificate by (PM/Dy. CPM)

(c) **Details of Inspection of a Bridge-** Flooring and Foundations, masonry inSub-Structure, Under Water Sub-structure inspection, Protective Works and Water ways, Girder Alignment and Seating, Structural Condition of Girders, Track on the Bridge Approaches, Trolley and Safety Refuses, FootPath, Painting, marking HFL and Danger Level, Providing Foundation Particulars and Bridge Name Boards, Flood records at Important Bridges, special Inspection during Monsoon, Equipment required for Inspection of Bridges.

5. **Acquisition, Management and Disposal of Land-**
Ownership of DFCCIL (Railway) LAND, Acquisition of Land, Relinquishment of Railway Land, Verification of Land Boundary, Land Plan, Maintenance of Right of Way, Religious Structure, Management of DFCCIL Land-Leasing, Licencing of land, Encroachment and Responsibility, New Land Acquisition Act 2013.

6. **Maintenance of Buildings and Structures other than Bridges-**
General Instructions, Buildings Register, Maintenance of Buildings, Inspection and Repair, Petty Repair, Books, Periodical inspections, Details of inspections, Maintenance aspects of Cracked Building and Repair tothe existing cracks, Treatment of Leaking roof.

7. **Maintenance of Sanitary and Hygienic Condition in Station Yards and Colonies, Water Supply, Drainage and Sewerages-**

a. **Water supply-**
Source of water supply, Water sample analysis, Pumping capacity, Shallow Tube wells, Deep Tube Wells, Impounding reservoirs, Storage Capacity, Flood discharge, Rainfall registers, High level Storage Tanks, Precaution against Pollution, Pumps-Types, selection, Water supply from outside sources, maintenance and Operation of Water supply, Water supply scheme for Station and colony, Rain Water Harvesting.

b. **Drainage and Sewerage-**
Drainage Systems, Waterborne Sewerage, size of Sewer, surface Drainage- Layout, size of Drain, Disposal of Sullage effluent, Drainage of Latrines, maintenance of Sewerage and Drainage system, Maintenance of open SullageDrain, Strom Water Drain.

8. **Works affecting Railway Safety:**
Reference of Rules, Works requiring Sanction of CRS and Notice thereof, Application to CRS, Execution of works and Safety Certificates, Work resulting from Accidents, Infringement to Schedule of Dimension- Conditions, Procedure thereof, Movement ODCs. Railway Operation-

a. **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.

b. **Engineering Restrictions and Indicator:**
General- Definitions: Works of short duration, Protection of Line in Block Section and Procedure of Passing trains, Works of long duration, Temporary Engineering Fixed Signals, Arrangement Prior to Commencement of Work, Protection in Block Section for Speed Restrictions, Procedure for Blocking Linesfor Engineering Purposes, Works at time of poor visibility, Temporary Signals in

Emergency, Periodical Notices of Engineering Restrictions, Permanent Speed Restriction indicators, review of Permanent Speed Restriction, Indicators.

c. **Working of Trollies-**
General- Instructions- Rules for working, Certificate of Competency, Official permitted to use Trollies and Lorries, responsibility for Safe Working, Working at Night or in Bad Weather,working on Track Circuited Sections, Conveyance of Non-Railway Officials and Trolley Permits for Private Sidings.

d. **Ballast and Material Trains-**
General- Rules and Working, ordering of Ballast Trains, issue of "Fit to Run" Certificate,

Equipment Testing of Brake Power, Working in Block Section, Running on Ghat Section, Loading and unloading from Hopper Wagons, Planning of Ballast and Material Train Movements, Training out materials and daily reports of Ballast Train Working, Charge of Ballast Train, register of Engineering Vehicles.

9. **Accidents-**
General- Observance of Rules, Duties and Responsibility of the Engineering officials in the event of Accident imparting through Traffic action at Site, Action in case of Derailments, Examination of Site and preparation of Sketches, Recording Track and Rolling Stock Measurements- Restoration through Running Procurement and arrangement of labour and Equipment, Temporary arrangements at Site of Accident, Transhipment, attendance of police at Accidents site, Driver's Reports on defect in Track, Action on receipt of Report of Defective Track, Abnormal occurrence Attributable to Oscillation of Locomotives, Accidents not Impairing through Traffic, records of Accidents.

10. **Rivers & Floods, Pre-Monsoon Precautionary measures & Patrolling ofRailway Line-**

a. **River and Floods-**
General- Behaviour of Rivers, Watchmen at Important Bridges, Pitching stone and Boulder Reserve, Vigilance During Floods, Flood records, River Protection Works, Types, Design, Repairs and Maintenance Records- Rivers and Floods.

b. **Pre-Monsoon Precautionary Measures-**
Vulnerable Sections, Materials for anticipated Emergencies, Monsoon Emergency Rakes, Equipment Tools, Rails Clusters, Temporary Bridge Span, Inspection and Vigilance over Railway affecting Tanks.

c. **Monsoon and Emergency Patrol-**
Kinds of Patrolling, Key Men's daily Patrol, Gang Patrol during Abnormal Rain, Systematic night Patrolling during Monsoon, Stationary Watchmen atVulnerable Points, Review of Patrolling System and Vulnerable locations, Security Patrolling during Civil Disorders, Protection of Line in Emergency, duties of patrolling and their Equipment, Reporting damage and obstructionon Track to Station Masters, Surprise checking at Night.

11. **DFCCIL/Railway Police,** Lodging Complaints, Cooperation with Railway Police, Cognizable offences, Non-Cognizable offences, Action by DFCCIL/Railway Staff in case of attempted Sabotage, Answering of CourtSummons, Prevention of Trespass, Disposal of Human Bodies found Run-Over, Disposal of Cattle found dead on the line.

12. **Track machines-**

(a) Functions and Performance parameter of various Track machines on Indian Railways.
(b) Performance and Quality Parameters in Tamping, Squeezing Pressure, Squeezing Time, Vibration Pressure and Tamping depth.
(c) Rules for movement and Block Working of Track machines.
(d) Minimum Duration of Blocks & Output/Effective Hrs. of Various Track Machines.

Reference: Codes, Manual, Specifications and Acts of Railway and DFCCIL:

(a) DFCCIL:
SSOD of Dedicated Freight Corridor, Schedule of Power, HR Manual with latest amendments.

Indian Railway:
Indian Railways P-Way Manual, Indian Railways Works Manual, Indian Railways Bridge manual, Track Machine Manual, USFD Manual and Welding Manual.

Annexure 'B' 2

Proposed Syllabus for professional papers for Promotion to Jr. Manager E-2 level (CIVIL) in DFCCIL.

Professional Subject 100 Marks

Railway Engineering-

1. Railway Track:
Description, Specifications and Function of the Structure Elements - Rails, Sleepers, Fastening, Ballast, Formation, Points and Crossings, Geometry and design features of Track lay-out.

2. Maintenance of Permanent Way:

(a) Regular Track Maintenance, Mechanised Track Maintenance System, Systematic Overhauling, Through Packing, Picking up slacks, Lifting and Lowering of Track, Deep Screening of Ballast, Lubrication of Rail Joints, Adjustment of Creep, Maintenance of Level Crossings, Maintenance of Points and Crossing.

(b) Maintenance of curve track and Realignment of Curves, Transitions, super Elevation of Curves, Safe Speed, Cant Deficiency, Speed on Curve with Turnout.

(c) Track Monitoring, Testing of Track with Track recording Car, Frequency of Track recording, Track Geometry parameters recorded by TRC, Track Quality Index, Chord for measurement/report, OMS Frequency and Category, Recording of Defects, Classification of track Quality, Oscillograph Car.

(d) Maintenance and Working of Various Track machines.

3. Maintenance of Bridges & Inspection of Bridges:
Classification of Bridges, Vertical Clearances & Free Board, Records of inspection, Details of Bridge Inspections, Numerical Rating System (NRS), Works connected with maintenance of Bridges, Details of common repair techniques like Cement Pressure Grouting, Epoxy Grouting and Shot creting/Guniting, replacing Crack Bed blocks, Painting of steel works, Bridge Bearing.

4. Inspection & Maintenance of buildings and Structures other than Bridges:
Additions and Alterations to Quarters, Transfer of buildings, Buildings Register, Maintenance of Buildings, Inspection and Repair, Petty Repair Books, Periodical inspections, Details of inspections, Maintenance aspects of Cracked Building and Repair to the existing cracks.

5. Works affecting Railway safety and Opening of New Works:
Reference of rules, Works requiring Sanction of CRS and notice thereof, Application to CRS, Execution of works and Safety Certificates, documents to accompany application, submission of safety Certificate, Deviation from Plans approved by CRS, Application for running out New Types of Locomotive and or Rolling Stock and increase in speed, Notification to Railway Officials when Opening works, Work resulting from accidents, Movement ODCs-Types and procedure for Sanction for Movement, Precaution during Movement.

6. Acquisition, Management and Disposal of Land:
Ownership of DFCCIL (Railway) LAND, Acquisition of Land, Relinquishment of Railway Land, Outstanding cases of Acquisition and Relinquishment of Land, Land

records, Demarcation of Land Boundaries, Verification of Land Boundary, Action to be taken while Handing Over and Taking Over of charge by Supervisors, Land Plan, Maintenance of Right of Way, Religious Structure, Management of DFCCIL Land-Leasing, Licencing of land, Encroachment and Responsibility, New Land Acquisition Act 2013.

7. Engineering Restrictions and Indicators, Working of Lorries, Trollies & Material Train:

(a) Engineering Restrictions and Indicator:
Categories of Engineering Works - Works of short duration & Long Duration, Protection of Line in Block Section and Procedure of Passing trains, Temporary Engineering Fixed Signals, Arrangement Prior to Commencement of work, Protection in block Section for Speed Restrictions, Procedure for Blocking Lines for Engineering Purposes, Works at time of poor visibility, Temporary Signals in Emergency, Periodical notices of Engineering Restrictions, Permanent Speed restriction indicators.

(b) Working of Trollies:
Rules for Working, Distinction Between Trollies, Trollies and Motor Trollies, Certificate of Competency, Officials Permitted to use Trollies and Lorries, Responsibilities for safe Working, Efficient Breaks , Attachment of Trains Prohibited , Working at Night or in bad Weather, Working on Track Circuited Sections and section provided with Axle counters , Numbering of trollies/Motor trollies/Lorries, Conveyance of trollies/Motor trollies/Lorries by train, Trollies, Motor trollies, Lorries not use, Conveyance of Non-Railway Officials, Trolley permits for Private Sidings, trolley Refuges and observation posts, Equipment for trollies and Lorries, Working of Trollies and Lorries- in Block Sections in Station Limits, Rail Dollies and moped Trollies.

(c) Ballast and material trains:
Rules for working, Restrictions in Running, Ordering of Ballast Trains, Issue of "Fit to run" Certificate, Equipment, Testing of Brake Power, Working in Block Section, Running on Ghat Section and descending grade, Loading and Unloading from Hopper Wagons, Planning of Ballast and Material Train movements, Training out Material and daily Report of Ballast Train Working, Charges for Ballast trains, Register of Engineering Vehicles.

8. Level Crossings (LC):
Classification of LC, Normal Position of Gates, Level Crossings Equipment, Traffic and Engineering Gates, Duties of Gatemen, Maintenance of Level Crossings, Examination of Gate Equipment and Gatemen rules, Level Crossings Register, Road Traffic Census, Elimination of Level Crossing, Criteria of replacement of Existing Level Crossing.

9. Accident:
Observation of Rules, Report of Accident to Station masters, Reporting details of Accident, Accidents impairing Through Traffic, Action at site, Examination of site and Preparation of Sketches, Recording particulars at site of accident, Use of Recorded Data, Procurement and arrangement of Labour, Diversion, Transhipment, Flooded causeways/dips, Special precaution when track is submerged, Funds required during Emergencies, Attendance of Police at site, Conducting Accident Enquiary, records of accidents.

10. Rivers & Floods, Pre-Monsoon Precautionary measures and Patrolling of Railway Line:

(a) River and Floods:
Behaviour of Rivers, Watchmen at Important Bridges, Pitching stone and boulder Reserve, Vigilance During Floods, Flood records, survey of Course of River, River Protection works, Types, Design, repairs and Maintenance Records- Rivers and Floods.

(b) Pre-Monsoon Precautionary Measures:
Vulnerable Sections, Materials for anticipated emergencies, Monsoon emergency Rakes, Equipment Tools, Rails Clusters, Temporary Bridge Span, Protective Works Railway effecting Tanks, Inspection and Vigilance over Railway affecting Tanks, Pre-Monsoon, During Monsoon.

(c) Monsoon and Emergency Patrol:
Kinds of Patrolling, Key Men's daily Patrol, Gang Patrol during Abnormal Rain, Systematic night Patrolling during Monsoon, Stationary Watchmen at Vulnerable Points, review of Patrolling System and Vulnerable locations, Security Patrolling during Civil Disorders, Protection of Line in emergency, duties of patrolling and their Equipment, Reporting damage and obstruction on Track to Station Masters, Check Over Patrolling, Inspection of Equipment, surprise checking at Night.

11. Miscellaneous:

(a) Explosives:
Issue of Instructions on use of Explosives, Observance of Rule, Carriage of Explosives, Protection to Trains and Railway Property, Precaution to be observed during blasting, Misfire with Electrical Method of Firing, Explosives disposal, Detonating signals-Care and Custody, use of Detonators and test.

(b) Law and Order:
DFCCIL/Railway Police, Lodging Complaints, Cooperation with Railway Police, Cognizable offences, Non-Cognizable offences, Power of Arrest by Railway/DFCCIL Staff, Warrant against DFCCIL/Railway Staff, Action by DFCCIL/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.

12. Track machines:
(a) Functions and Performance parameter of various Track machines on Indian Railways.
(b) Controls and Working Systems of Various Track machines.
(c) Performance and Quality Parameters in Tamping, Squeezing Pressure, Squeezing Time, Vibration Pressure and Tamping depth.
(d) Rules for movement and Block Working of Track machines.
(e) Minimum Duration of Blocks & Output/Effective Hrs. of Various Track Machines.

13. Construction Materials:
Description, Specification, Properties and uses of Building materials-Stones, Sand, Timber, Bricks, Cement, Paints.

Reference: Codes, Manual, Specifications and Acts of Railway and DFCCIL:

(a) DFCCIL: SSOD of Dedicated Freight Corridor, Schedule of Power, HR Manual with latest amendments.

(b) Indian Railway: Indian Railways P-Way Manual, Indian Railways Works Manual, Indian Railways Bridge manual, Indian Railways Track Machine Manual, Indian Railways USFD Manual and Welding Manual.

No. HQ-HR0CMER (PFIL)/268/2020-HR-CMER(5875)

Date: 20th Dec. 2024

CIRCULAR No.1079/2024

Sub: Syllabus for the Inter-Cluster Departmental Promotion exam through CBT for N5, E0 and E2 level.

1. This is in supersession to all the earlier guidelines and instructions issued on the subject.

2. In terms of the revised promotion policy issued vide Circular No 640/2020 dated 16.10.2020 read along with the amended policy guidelines issued vide Circular No. 36/2023 dated 09.10.2023, written examinations are to be conducted for promotion to N5, E0 and E2 levels.

3. Syllabus cum weightage of Sections for E0 & E2 level

Sections	Maximum Marks for each Section (E0 & E2)
Subject knowledge (Department specific)	70% (Department wise syllabus attached as Annexure-A1 to A13)
General topics	30%

4. General topics to be covered for all the departments for E0 & E2 level are tabulated below: -

Department	General topics (E0 level)	General Topics (E2 level)
All Departments	General English, Mathematical Ability, General Knowledge including General Science, SOP related to concerned Department, HR policies/rules like Leave Rules, Conduct Rules, Gratuity, Welfare Schemes of DFCCIL, Advances,LTC, CTG, Pay & Allowances, etc., Vigilance Awareness, Knowledge about DFCCIL & Indian Railways.	Mathematical Ability, SOP related to concerned Department, HR policies/rules like Leave Rules, Conduct Rules, Gratuity, Welfare Schemes of DFCCIL, Advances,LTC, CTG, Pay & Allowances, etc., Vigilance Awareness, Knowledge about DFCCIL & Indian Railways.

5. Syllabus cum weightage of Selections for N5 level -

Sections	Maximum Marks for each section (For N5)	Subjects
Section- I	30%	Syllabus attached as Annexure-B.
Section- II (General topics)	70%	General Knowledge, General Science & Technical Ability, Mathematical Ability, Logical Reasoning/General Intelligence, Knowledge about DFCCIL & Indian Railways.

6. **Rajbhasha (Optional Section 10% Weightage) :-**

There will be questions on 'Rajbhasha' for 10% marks and the same will be optional. The syllabus of the same is attached as Annexure-C.

Note: - The Syllabus given above is indicative. There may be some variations in the actual Question Paper (i.e. online CBT) which will not constitute a valid ground for raising objections as the variation, if any, will be common for all candidates for a particular category.

7. This issues with the approval of the Competent Authority.

(Shuchi)
Dy. General Manager/HR

Copy for information to-

1. Secy. to MD - for kind information of MD.
2. Director/Finance, Director/Infra, Director/OP&BD and CVO
3. All ED's;
4. All CGMs/GMs/GGMs;
5. Manager/IT-for placing the order on Intranet; and
6. Notice Board.

Index for Syllabus of all Departments of DFCCIL for Departmental Promotion in E2, E0 & N5 Level.

SN	Department	Level	Annexure	Page No.
1	Civil	E0	A1	1-4
		E2	A2	5-8
2	Electrical	E0	A3	9-10
		E2	A4	11-13
3	S&T	E0	A5	14-16
		E2	A6	17-19
4	OP&BD	E0	A7	20-22
		E2	A8	23-29
5	Mechanical	E0	A9	30-31
		E2	A10	32-34
6	Finance	E2	A11	35
7	IT	E2	A12	36-37
8	HR	E2	A13	38-40
9	Common Syllabus	N5	B	41-43
10	Rajbhasha Syllabus	For all	C	44

A-1

Syllabus for professional papers for Promotion to Executive E-0 level (CIVIL) in DFCCIL

Professional Subject

1. Railway Track:

Track Structure And Components

Classification of Dedicated Freight Corridors, the features of track structure of main lines and connecting lines for DFC, Cross Section of Track, Formation of DFC.

Ballast

Ballast Specifications, Ballast Profile /Section/Depth of Cushion.

Sleepers & Fastenings

General, Prestressed Concrete Sleepers, Sleeper Density, Fastenings on PSC sleepers.

Rail And Rail Fastenings

Standard Sections of Rails, Identification of Different Qualities of Rails in the Field, Recommended Rail Section, Fastenings on PSC sleepers.

Buffer Stops

Friction Buffer Stops, Parts of Friction Buffer Stop, Types of Buffer stops.

Insulated Joints & Switch Expansion Joints

Insulated joints, Switch Expansion Joint.

Track Structure On Bridges

Rail and rail joints on Bridges, Steel Sleepers on Bridges, Provision of Guard Rails on Bridges and Tunnels, Provision of Guard Rails, Provision of Side Pathways and Walkways.

Points & Crossing

Turnout, Turnouts used in DFCCIL, Key Parameters for Turnouts used in DFCCIL, Weldable Crossing, Check Rail, Type of Slide Chair used, Back Drive, Torsional Type Back Drive.

2. Maintenance of Track:

(a) Track Maintenance (Excluding rails) & Emergency Response

Mechanized Track Maintenance System, On-track Mechanized Maintenance Unit (OMU), Mobile Maintenance Unit (MMU), Checking work of contractor's gang, Rolling Block Program and Maintenance Planning, Yearly report on the condition of Permanent Way, Procedure for maintenance activity, planned tamping of plain track and Points &Crossings, Picking up of Slacks, Maintenance of yard lines.

(b) Curves

Determination of Radius, The Reference rail for level, Safe Speed on Curves, Super-elevation and Cant Deficiency, Length of Transition Curve and Setting-out Transitions, Compound Curves, Reverse Curves, Running out Super-elevation, Indicators/Board/QR bar codes Provided in Curves, Permissible Speed over Curved Main Line at Turnouts, No Change of Super-elevation over Turnouts, Curves of Contrary Flexure, Curves of Similar Flexure, Curves with Cross Overs, Vertical Curve, Checkrails on Curves, Wear on outer Rail of Curve.

(c) Mechanized Inspection of Track Geometry & Patrolling

Mechanized inspections, Track Recording Cars, Track geometry parameters measured by the Track Recording Car, Reporting of TRC results, Action to be taken after Track Recording by TRC, Parameter Indices, Track Quality Index (TQI), Oscillation monitoring system (OMS), Unattended Track Inspection System (UTIS), Recording of Defects, New Track Tolerances, Planning of maintenance, Maintenance limits, Action to be taken based on TRC results, Track Parameters in floating conditions for Maintenance, Track Parameters for low speeds.

(d) Inspection And Maintenance of Turnouts:

Inspection of Points and crossings, Maintenance of Point and Crossing, Maintenance of Torsional Type Back drive, Maintenance of Back drive non-Torsion, Maintenance of SSD, Creep Monitoring Valve, Replacement of Defective/worn-out X-ing in CWR territory, Replacement of Defective/worn-out Tongue/Stock Rail in CWR Territory,

Replacement of check rail, Maintenance of Lead portion and turn-in curve, Robotic Reconditioning of CMS Crossing, Competency of reconditioning welder, Periodical Inspection of Reconditioned Crossing, Destressing of Turnout zone of CWR at destressing temperature.

(e) Maintenance Of Track in Electrified Areas:
General instructions and general knowledge of Staff, Special Instructions to Staff Working in Traction area, Precautions while working in traction areas, Maintaining Continuity of Track, Fire in Electrified Areas, Permanent Way Tools, Treatment of Persons Suffering from Electric Shock, Accident to Power Lines of outside Bodies, Provision and Maintenance of Signalling Fixtures in Track.

(f) Hot and Cold Weather Patrolling: Hot Weather Patrolling. Cold Weather Patrolling. Monsoon Patrolling. Equipment of Monsoon Patrolmen.

(g) Destressing Of LWR/CWR & Inspection and Repair of Rail:
Need of Destressing, De-stressing with super-Puller along with FB Welding, Destressing with Rail Tensors with AT Welding, Destressing without Rail Tensors/Super Pullar, Equalization of Stresses after Permanent Repair in LWR/CWR, Replacement of Switch Expansion Joint, Maintenance of Insulated Joints, Rail Temperature, Rails corrosion, Rail Fractures, Rail Fracture Repair Stages, Rail Fracture reporting and investigation, Buckling of Track, Buckling and its investigation, Repairs to buckled Track, USFD Testing.

3. **Welding of Rails (AT Welds & FB Welds):**
General, Alumino-Thermic welding (AT Welding), Selection of rails to be welded, Portion for welding, Equipment, Staff and Traffic block for welding, Training and Certification of welder, Record of joint geometry, List of Equipment, Flash Butt Welds, Rail welding by mobile flash butt welding plant, Acceptance Tests

4. **Maintenance of Bridges & Inspection of Bridges:**
Classification of Bridges, Vertical Clearances & Free Board, Records of inspection, Bridge Inspection, Numerical Rating System (NRS), Inspection & Maintenance Schedule in DFCCIL, Works connected with maintenance of Bridges, Details of common repair techniques like Cement Pressure Grouting, Epoxy Grouting and Shotcreting/ Guniting, Painting of steel works, Bridge Bearings, Pre & Post Monsoon Inspection, Monsoon Reserve.

5. **Inspection & Maintenance of buildings and Structures other than Bridges:**
Additions and Alterations to Quarters, Transfer of buildings, Buildings Register, Maintenance of Buildings, Inspection and Repair, Petty Repair Books, Periodical inspections, Details of inspections

6. **Sanction for works affecting running lines:**
Works Requiring the Sanction of MD/DFCCIL, Works requiring sanction of Zonal railway, Application for Sanction of Works, Notification to Railway Officials When Opening Works, Correction Slips of DFCC's Railroad Manual.

7. **Acquisition, Management and Disposal of Land:**
Land Records, Demarcation of Land Boundaries, Verification of Land Boundary, Action to be taken while Handing Over and Taking Over of charge by Supervisors, Land Plan, Maintenance of Right of Way.

8. **Engineering Restrictions and Indicators, Working of Lorries, Trollies & Material Train:**

(a) Safety Protocol and Engineering Indicators: Work Involving Danger to Train or Traffic, Carrying out of Works in case of Emergency, Works which Obstruct the line, Works requiring complete block protection, Categories of Engineering Works,

Works of Short Duration, Works of Long Duration, Temporary Engineering Fixed Signals- Location and Details, Procedure for Passing Trains at Stop Dead Restrictions, Procedure for Blocking Line for Engineering Purposes, Issue of Caution Orders to Drivers, Temporary Signals in Emergency, Permanent Speed Restriction Indicators, Indicators (General), Detonating Signals, Warning Signal- Descriptions, Use of Warning Signals, Safe working of contractors.

(b) Transportation of Man And Material on Track, Working of Trollies, Motor Trollies And Lorries:

General rules. Distinction between Trolley, Motor Trolley and Lorry, Certificate of Competency Officials, Permitted to use Trollies, Motor Trollies and Lorries, Responsibility for Safe Working, Efficient Brakes. Attachment to Trains Prohibited, Working on Track Circuited Sections and Sections Provided with Axle counters, Numbering of Trollies/Motor Trollies/ Lorries, Conveyance of Trollies/Motor Trollies/ Lorries by Trains, Trollies, Motor Trollies and Lorries not in use, Conveyance of Non-DFC Officials, Equipment for Trolley / Motor Trolley / Lorry, Signals for Motor Trolley / Lorry, Working of Motor Trollies/Moped Trollies. Working of Lorries, Rail Dolley's.

(c) Working of Material Trains And Track Machines:

Rules for the working of Material Trains, Material Train Economical Working, Restrictions in Running, Brake-vans and Shelter Wagons, Ordering of Material Trains, Issue of "Fit-to-Run" Certificate, Official–in–charge of Material Train, Equipment, Testing of Brake Power, Working in Block Section, Procedure to be Followed while Pushing Back, Passage over Points. Speed of Material Trains, Stabling of a Material Train, Reporting Deficiencies and Damages, Warning to Workers, Engine Crew's Hours of Duty.

Loading and unloading from hopper ballast wagons:

Staff Responsible, Working Trip, Operation of Hoppers, Training out Material and Daily Reports of Working, Charges for Material Train Working, Register of Engineering Vehicles, Working of Track Maintenance Machines.

9. Accident:

Scope of the rules, Acquaintance with the rules, Objectives in dealing with accidents, Resources of all Departments to be made available, Every Official to render all possible assistance, Action by the DFCCIL Employee, Action to be taken by the Station Master on receiving advice of an accident, Telephonic Report to Corporate Office, Duties of P-Way Branch, Instruction of Railway Board for accident enquiry over DFCCIL alignment, Notice of Accident on DFCCIL, Proceedings of Inquiry.

10. River and Floods:

Watchmen at Important Bridges, stone pitching work and boulder Reserve, Vigilance during Floods, Flood records, survey of Course of River, River Protection works, Repairs and Maintenance Records- Rivers and Floods.

11. Miscellaneous:

Explosives:

Issue of Instructions on use of Explosives, Observance of Rule, Carriage of Explosives, Protection to Trains and Railway Property, Precaution to be observed during blasting, Explosives disposal, Detonating Signals- Care and Custody, use of Detonators and Test.

12. Track Machines:

(a) Functions and Performance parameter of various Track Machines.
(b) Controls and Working Systems of Various Track machines.
(c) Performance and Quality Parameters in Tamping, Squeezing Pressure, Squeezing Time, Vibration Pressure and Tamping depth of Tamping Machine.

(d) Rules for movement and Block Working of Track machines.
(e) Minimum Duration of Blocks & Output/Effective Hrs. of Various Track Machines.

13. **Estimation, Costing and Tendering:** Types of Estimates, Types of Tenders, Classification of Contracts, Methods of Procurement, Dispense with Tender i.e. Quotations, Security Deposit, Earnest Money, Performance Bank Guarantee, Mobilisation Advance, Extension of Time in Contract, Termination of Contract.

Reference: Codes, Manual, Specifications and Acts of Railway and DFCCIL:

(a) DFCCIL: DFCCIL Railroad Manual- July 2024, DFCCIL Works Manual, Monsoon Booklet of DFCCIL, DFCCIL Accident Manual, SSOD of Dedicated Freight Corridor, Schedule of Power, HR Manual with latest amendments (Second Revision).

(b) Indian Railway: Indian Railways Bridge manual, Indian Railway Works Manual, Indian Railways Track Machine Manual, Indian Railways USFD Manual and Welding Manual.

Syllabus for professional papers for Promotion to Jr. Manager E-2 level (CIVIL) in DFCCIL

Professional Subject

1. Railway Track:

Track Structure And Components

Classification of Dedicated Freight Corridors, the features of track structure of main lines and connecting lines for DFC, Cross Section of Track, Formation of DFC.

Ballast

Ballast Specifications, Ballast Profile /Section/Depth of Cushion.

Sleepers & Fastenings

General, Prestressed Concrete Sleepers, Sleeper Density, Fastenings on PSC sleepers.

Rail And Rail Fastenings

Standard Sections of Rails, Identification of Different Qualities of Rails in the Field, Recommended Rail Section, Fastenings on PSC sleepers.

Buffer Stops

Friction Buffer Stops, Parts of Friction Buffer Stop, Types of Buffer stops.

Insulated Joints & Switch Expansion Joints

Insulated joints, Switch Expansion Joint.

Track Structure On Bridges

Rail and rail joints on Bridges, Steel Sleepers on Bridges, Provision of Guard Rails on Bridges and Tunnels, Provision of Guard Rails, Provision of Side Pathways and Walkways.

Points & Crossing

Turnout, Turnouts used in DFCCIL, Key Parameters for Turnouts used in DFCCIL, Weldable Crossing, Check Rail, Type of Slide Chair used, Back Drive, Torsional Type Back Drive.

2. Maintenance of Track:

(a) Track Maintenance (Excluding rails) & Emergency Response

Mechanized Track Maintenance System, On-track Mechanized Maintenance Unit (OMU), Mobile Maintenance Unit (MMU), Checking work of contractor's gang, Rolling Block Program and Maintenance Planning, Yearly report on the condition of Permanent Way, Procedure for maintenance activity, planned tamping of plain track and Points &Crossings, Picking up of Slacks, Maintenance of yard lines.

(b) Curves

Determination of Radius, The Reference rail for level, Safe Speed on Curves, Super-elevation and Cant Deficiency, Length of Transition Curve and Setting-out Transitions, Compound curves, Reverse Curves, Running out Super-elevation, Indicators/Board/QR barcodes Provided in Curves, Permissible Speed over Curved Main Line at Turnouts, No Change of Super-elevation over Turnouts, Curves of Contrary Flexure, Curves of Similar Flexure, Curves with Cross Overs, Compensation for Curvature on Gradient, Vertical Curve, Re-Alignment of Curves, Checkrails on Curves, Wear on outer Rail of Curve.

(c) Mechanized Inspection of Track Geometry & Patrolling

Mechanized inspections, Track Recording Cars, Track geometry parameters measured by the Track Recording Car, Chords for measurements, Reporting of TRC results, Action to be taken after Track Recording by TRC, Parameter Indices, Track Quality Index (TQI), Oscillation monitoring system (OMS), Unattended Track Inspection System (UTIS), Recording of Defects, New Track Tolerances, Planning of maintenance, Maintenance limits, Action to be taken based on TRC results, Realignment criteria for Curves, Track Parameters in floating conditions for Maintenance, Track Parameters for low speeds, Stability of trains against derailment.

(d) Inspection And Maintenance of Turnouts:

Inspection of Points and crossings, Maintenance of Point and Crossing, Maintenance of Torsional Type Back drive, Maintenance of Back drive non-Torsion, Maintenance of SSD, Creep Monitoring Valve, Replacement of Defective/worn-out X-ing in CWR territory, Replacement of Defective/worn-out Tongue/Stock Rail in CWR Territory, Replacement of check rail, Maintenance of Lead portion and turn-in curve, Robotic Reconditioning of CMS Crossing, Competency of reconditioning welder, Periodical Inspection of Reconditioned Crossing, Destressing of Turnout zone of CWR at destressing temperature.

(e) Maintenance of Track in Electrified Areas:
General instructions and general knowledge of Staff, Special Instructions to Staff Working in Traction area, Precautions while working in traction areas, Maintaining Continuity of Track, Fire in Electrified Areas, Permanent Way Tools, Treatment of Persons Suffering from Electric Shock, Accident to Power Lines of outside Bodies, Provision and Maintenance of Signalling Fixtures in Track.

(f) Hot and Cold Weather Patrolling: Hot Weather Patrolling. Cold Weather Patrolling. Monsoon Patrolling. Equipment of Monsoon Patrolmen.

3. **Rail Management & Rail Inspections:**
Rail Temperature, Rail Longitudinal stress measurement in floating conditions, Rails corrosion, Wear, USFD Testing, Rail Profile measurement, Corrugation, Destressing of Rail, Rail Grinding, Rail Lubrication, Painting for Corrosion, Frequency of Painting on rails, Repair of Wheel burns by Reconditioning, Handling and Stacking of Rails, Lubrication of Rail Joints, Rail Fractures, Rail Fracture Repair Stages, Rail Fracture reporting and investigation, Buckling of Track, Buckling and its investigation, Repairs to buckled track

4. **Maintenance of Bridges & Inspection of Bridges:**
Classification of Bridges, Vertical Clearances & Free Board, Records of inspection, Detailed Bridge Inspection, Numerical Rating System (NRS), Inspection & Maintenance Schedule in DFCCIL, Works connected with maintenance of Bridges, Details of common repair techniques like Cement Pressure Grouting, Epoxy Grouting and Shotcreting/ Guniting, replacing Crack Bed blocks, Painting of steel works, Bridge Bearings, Pre & Post Monsoon Inspection, Monsoon Reserve.

5. **Inspection & Maintenance of buildings and Structures other than Bridges:**
Additions and Alterations to Quarters, Transfer of buildings, Buildings Register, Maintenance of Buildings, Inspection and Repair, Petty Repair Books, Periodical inspections, Details of inspections, Maintenance aspects of Cracked Building and Repair to the existing cracks.

6. **Sanction for works affecting running lines:**
Works Requiring the Sanction of MD/DFCCIL, Works requiring sanction of Zonal railway, Application for Sanction of Works, Notification to Railway Officials When Opening Works, Correction Slips of DFCC's Railroad Manual.

7. **Acquisition, Management and Disposal of Land:**
Salient feature of RAA 2008, Taking position of the acquired land, Transaction of the fund & reconciliations, Completion of the land proceedings, Transfer of land to Indian Railways, The Railway (Amendment) Act 2008, The Right of Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013

8. **Engineering Restrictions and Indicators, Working of Lorries, Trollies & Material Train:**

(a) Safety Protocol and Engineering Indicators: Work Involving Danger to Train or Traffic, Carrying Out of Works, in case of Emergency, Works, which Obstruct the

line, Works requiring complete block protection, Categories of Engineering Works, Works of Short Duration, Works of Long Duration, Temporary Engineering Fixed Signals- Location and Details, Procedure for Passing Trains at Stop Dead Restrictions, Procedure for Blocking Line for Engineering Purposes, Issue of Caution Orders to Drivers, Temporary Signals in Emergency, Permanent Speed Restriction Indicators, Indicators (General), Detonating Signals, Warning Signal-Descriptions, Use of Warning Signals, Safe working of contractors.

(b) Transportation of Man And Material on Track, Working of Trollies, Motor Trollies And Lorries:

General rules. Distinction between Trolley, Motor Trolley and Lorry, Certificate of Competency Officials, Permitted to use Trollies, Motor Trollies and Lorries, Responsibility for Safe Working, Efficient Brakes. Attachment to Trains Prohibited, Working on Track Circuited Sections and Sections Provided with Axle counters, Numbering of Trollies/Motor Trollies/ Lorries, Conveyance of Trollies/Motor Trollies/ Lorries by Trains, Trollies, Motor Trollies and Lorries not in use, Conveyance of Non-DFC Officials, Equipment for Trolley / Motor Trolley / Lorry, Signals for Motor Trolley / Lorry, Working of Motor Trollies/Moped Trollies. Working of Lorries, Rail Dolley's.

(c) Working of Material Trains And Track Machines:

Rules for the working of Material Trains, Material Train Economical Working, Restrictions in Running, Brake-vans and Shelter Wagons, Ordering of Material Trains, Issue of "Fit-to-Run" Certificate, Official–in–charge of Material Train, Equipment, Testing of Brake Power, Working in Block Section, Procedure to be Followed while Pushing Back, Passage over Points. Speed of Material Trains, Stabling of a Material Train, Reporting Deficiencies and Damages, Warning to Workers, Engine Crew's Hours of Duty.

Loading and unloading from hopper ballast wagons:

Staff Responsible, Working Trip, Operation of Hoppers, Training out Material and Daily Reports of Working, Charges for Material Train Working, Register of Engineering Vehicles, Working of Track Maintenance Machines.

9. Accident:

Scope of the rules, Acquaintance with the rules, Objectives in dealing with accidents, Resources of all Departments to be made available, Every Official to render all possible assistance, Action by the DFCCIL Employee, Action to be taken by the Station Master on receiving advice of an accident, Telephonic Report to Corporate Office, Duties of P-Way Branch, Instruction of Railway Board for accident enquiry over DFCCIL alignment, Notice of Accident on DFCCIL, Proceedings of Inquiry.

10. Rivers & Floods:

Watchmen at Important Bridges, pitching stone and boulder Reserve, Vigilance during Floods, Flood records, survey of Course of River, River Protection works, Types, Repairs and Maintenance Records- Rivers and Floods.

11. Miscellaneous:

Explosives:

Issue of Instructions on use of Explosives, Observance of Rule, Carriage of Explosives, Protection to Trains and Railway Property, Precaution to be observed during blasting, Explosives disposal, Detonating Signals- Care and Custody, use of Detonators and Test.

12. Track Machines:

(a) Functions and Performance parameter of various Track Machines.

(b) Controls and Working Systems of Various Track machines.

(c)Performance and Quality Parameters in Tamping, Squeezing Pressure, Squeezing Time, Vibration Pressure and Tamping depth of Tamping Machine.

(d) Rules for movement and Block Working of Track machines.
(e) Minimum Duration of Blocks & Output/Effective Hrs. of Various Track Machines.

13. **Estimation, Costing and Tendering:** Types of Estimate, Types of Tender, Classification of Contracts, Methods of Procurement, Procedures for Bidding and Bid Evaluation for Procurement with Prequalification, Cost of Bid Document, Bid Security, Technical Bid, Financial Bid, Priority of Documents, General Procedures to be followed while opening of the Bids, Evaluation of Bids, Dispense with Tender i.e. Quotations, Security Deposit, Earnest Money, Performance Bank Guarantee, Mobilisation Advance, Extension of Time in Contract, Programme/Schedule Analysis, Liquidated Damages, Termination of Contract, Dispute Resolution In Contracts

Reference: Codes, Manual, Specifications and Acts of Railway and DFCCIL:

(a) DFCCIL: DFCCIL Railroad Manual- July 2024, DFCCIL Works Manual, Monsoon Booklet of DFCCIL, DFCCIL Accident Manual, SSOD of Dedicated Freight Corridor, Schedule of Power, HR Manual with latest amendments (Second Revision).

(b) Indian Railway: Indian Railways Bridge manual, Indian Railway Works Manual, Indian Railways Track Machine Manual, Indian Railways USFD Manual and Welding Manual.

Syllabus for promotion to E0-E1 cluster in Electrical Department

A. **GENERAL•**

1. **Establishment** – General knowledge about DFCCIL organization and Electrical Department in particular, Level Rule, DAR and Service conduct rules. medical rules, Procedure of imposing Minor & Major penalties, Workmen's compensation Act, HOER, provisions of Minimum wages act, incentive schemes etc.
2. **Store** –imprest, Type of stores, stock verification, Tenders, types of tenders. stock and non-stock items and initiation of indents,
3. **General Knowledge**-Current world and Indian affairs including sports, politics, science, health, literature etc., abbreviations, General knowledge concerned with Indian Railways.
4. **Raj Bhasha**-The details on Rajbhasha Rule 1963, 1976 pare 3(3) along with various awards, and benefits given for motivation to work in Rajbhasha. Progress made in Rajbhasha.

B. **TECHNICAL**

1. **Design Aspects:** Traction Sub-station: – Insulation Co-ordination. Spacing of substation Transformer and switchgear capacity, CT PT etc. OHE- Installation and checking of new OHE, detail procedure of commissioning of new OHE.
2. **Power supply arrangement**: Layout of 132KV/25KV Railway Traction sub-station, and its components. Earthing lay out of TSS/SP/SSP. Capacitor banks, need of capacitor banks. Calculation of KVAR needed to improve power factor, maintenance and troubleshooting of Capacitor bank. Traction Power Transformer, accessories, its protective devices, routine test and type test and parallel operation.
3. **Circuit Breaker & interrupter**: Principle of working, construction, special feature, maintenance & routine test of SF-6 gas type and vacuum type circuit breakers used in DFCCIL.
4. **Protective Relays**: Fault level & relays setting calculations. Details of protective relays provided at traction Sub-station. Type of relays, Electromechanical & Static, Microprocessor based relays provided at DFCCIL TSS, their purpose & setting calculations. Periodical testing of relays. Insulation co-ordination.
5. **OHE** Principles for lay out plans. Sectioning arrangement in 25KV AC Traction. Type of foundations their construction & usage. Different type of masts, portals employed in DFCCIL AC traction, their construction & usage. Types of OHES, construction details, speed potential & usage. General arrangement of OHE on tangent, curve track, points & crossing, neutral section etc

   Safety rules for TRD, Engineering, signalling staff for working in electrical section. Safety precautions in electrified sections as regards to fire, electric accidents, electric shocks, power blocks etc.

   Maintenance schedule for OHE [AOH & POH]. Bonding & Earthlings, Movement of ODC in electrified section.

   Design aspect of OHE. Regulation for electrical crossing of overhead lines and underground cables. Periodical testing & upkeep of tools tackles and meters, OHE layout, crass section, drawings, SED, SWR, Sectioning diagrams etc.

   Pantograph entanglement, investigation of causes, measures taken from TRD & Loco side to avoid panto entanglement.

OHE maintenance car (Tower Wagon) general idea about its operation maintenance and troubleshooting.

Record to be maintained in OHE depot.

Casting of foundation, erection of masts/portals, fabrication & erection of cantilevers, ATD, stringing of catenary & contact wire, adjustment of OHE etc.

6. **Remote control**

Working of Remote Control. Type of Batteries. SCADA (working advantages & special features). Working & record keeping of TPC. Power block & MN, coordination with operating and other department Liaison with supply authorities, isolation of faulty sections during breakdowns.

7. **Function of EIG in Railway.**

Electrical TARRIF and types. Concept of Open access of power drawl and its advantage.

Reporting of Electrical Accident and its procedure.

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Syllabus for promotion to E2-E4 cluster in Electrical Department.

A. Professional Subjects:

Part I: General Electrical Eng.

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

B. Part II: Railways Electrical Engg.

a. General Services:

1. **Power Supply arrangement:** Radial distribution system, Looped (Ring Main) system
2. **distribution systems.** Layout & Equipment at Distribution sub-station. Operation & Maintenance of sub-station, Various testing at sub-station, overhead & underground distribution, protective devices & their coordination. Construction, erection & commissioning of new sub-station and distribution lines. Basic features of PVC and
3. **XLPE cables.** Cable rating and derating, Cable laying. Concept of average demand, peak demand, load factor & electrical billing. Power factor improvement, Electrical & fire safety, Safety auditing of sub-station, concept of energy audit, Functions of Electrical Inspector to Government (EIG) in DFCCIL. Power line crossing, Electricity Act-2003, CEA Regulations, SCADA and Substation automation. Earthing arrangement.
4. **Building Electrification:** Various wiring methods, metering & safety measures. Wire, switchgears & fittings used for wiring, Energy efficient appliances, scale of fittings as

per policy in various types of quarters, various types of Tariffs, commercial connection, concept of prepaid and postpaid metering, concept of smart meters. Safety coordination, Electrical accidents and prevention.

5. **Illumination & Lighting:** Various parameters related to illumination, Different types of illumination sources, lighting methods, classification of lux levels at various types of stations, yard lighting & street lighting. Passenger amenities at Railway stations.
6. **Water supply:** Types of water supply system, Pumping system, Classification of pumps, Comparison of various pumps, fluid theory, discharge calculations. Centrifugal pump, turbine pump, Submersible pumps, characteristic curve of pumps, efficiency. Cavitations & priming of pumps, necessity of multistage pumping, storage capacity and purification of water. Installation, maintenance & troubleshooting of pumps, Starter & drives of pumps, automation of pumps.
7. **Lift & Escalator:** Working of Lift & Escalator, Installation of Lift and Escalator. Maintenance, various safety devices, control panels & Safety aspects.
8. **Air Conditioning & Refrigeration:** Theory of air conditioning, refrigeration cycles, various types of refrigerants, window/split/package AC unit. Central air conditioning plant, VRF system, air cooling systems, planning for capacity and drives for refrigeration plant, Maintenance and troubleshooting.
9. **Energy Conservation:** Need of conservation of energy, Various measures being taken by railways to conserve energy in the field of Electrical General Services. Necessity and implementation of Open Access in Indian Railways. Energy conservation Act.

b. Traction distribution:

1. **OHE:** Basic design concepts of TRD system of conventional and 2x25kV system. Types of overhead equipment. Sectioning principles of OHE. Various parts of OHE. Foot Patrolling, current collection, Tower wagons, seasonal & cyclic checks, maintenance Schedule, Preventive maintenance Tools, failure investigation of OHE, earthing and bonding. Electrification and process of construction. Power Blocks & Procedure to obtain it.
2. **PSI:** Schematics of 1x25kV and 2x25kV traction substation with names/ratings of various equipment, protection scheme for TSS. Fixed and dynamic PF correction, Feeding stations, SSP & SPs, 132 kV transmission lines, PSI equipment. Maintenance and failure investigation of PSI equipment. NDT techniques, Open Access, safety precautions for electrified sections,
3. **SCADA and Miscellaneous items**: Operation and maintenance of remote control, traction power control organization, permit to work, emergency arrangements, coordination with operating and other departments. Liaison with supply authorities, maintenance and failure investigation of SCADA equipment.
4. Latest development in TRD, MSG meetings. Instructions issued by Railway Board, RDSO's TI/MI, TCs, IRSOD & ACTM.

c. Electric Locos:

Conventional AC & 3 phase locomotives on IR. Equipment in locomotives, their functioning / operations & maintenance schedules. Traction Power Circuit, Auxiliary Circuit, Control Circuits and Pneumatic Circuits. Different types of braking arrangements. Safety items and safety checks involved in safe locomotive operation. Latest developments in the field of electric locomotives.

d. Store Matters:

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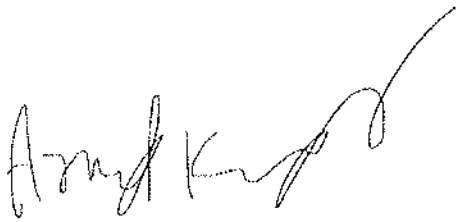
Procedure related to procurement of stock items and non-stock items, Procurement through GeM, IREPS. Schedule of powers under stores matters.

e. Tenders and Contracts:

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



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A-5

Revised Syllabus for Written Exam for promotion from Jr. Executive(N7) to Executive (S&T) (E0)

1. **General**

Heat, Temperature & Work, Expansion of solids, liquid & gases.

Simple motors & Dynamos, Principle of working of Transformer, Relay, Fuse, Circuit breaker.

AC & DC Power supply, Rectifiers, DC-DC Converter, Inverter.

2. **Fundamental Engineering & Applied Technology**

Magnetism, Electricity, Sound, Electrical Machinery and Circuits, Fundamental Electronics & Electronic Circuits, Power Supply Equipment and Systems, Protection Systems against Lightning & Surges, Principles of Optics & Optical Fibre Cable, Principles of Digital Electronics, Digital Devices and their Applications, Data Communications Principles & Information Technology, Basic LAN/WAN & Networking, Intranet/internet.

3. **Rules & Manuals**

DFCC G&SR, IR Signal Engineering Manual, IR Telecommunication Manual, IR AC Traction Manual, IR P-Way Manual, DFCC Block Working Manual, DFCC Schedule of Dimensions, DFCC Operation Manual, DFCC Works Manual, Disaster Management, DFCC Accident Manual, Rules for Opening of Railways, Store Procurement Manual & Policies

4. **Signalling**

Existing	**Proposed**
Basic Concept of Signalling	Basic Concept of Signalling
Principles of Interlocking	Principles of Interlocking, Signalling Interlocking Plan, Signalling route initiation upto complete arrival of train and route release principles
Selection Circuits & Control Table	Selection table/Control Table
Signalling Relays & Cables, DC Track Circuit, Axle Counters, Electrical Point Machine, Power supply arrangements for Signalling, DG Set, LC Gate, Datalogger	Signalling Elements-Relays, Cables, LED Signal, Electric Point Machine, Axle Counters (HASSDAC & MSDAC), Integrated Power Supply, UPS, Batteries, DG Set, Remote Diagnostic and Predictive Maintenance System (RDPMS), Data Loggers, LC Gates etc
Block Signalling (Block Proving by Axle Counter using	Intermediate Block Signalling (IBS), BPAC,UFSBI

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UFSBI, Intermediate Block Signalling (IBS)	
British Interlocking with Metal to Carbon Relays	British Interlocking with Metal to Carbon Relays
Colour Light & Automatic Signalling	Colour Light & Automatic Signalling
NA	Earthing, Lightning & Surge protection arrangements
Train Protection & Warning System (TPWS), European Train Control System (ETCS)	Train Protection System- TPWS, Kavach, Automatic Train Control System: Cab Signalling; on-board and trackside equipment, Interface with rolling stock; ECTS-Level 1,2,3, Concept of fixed block and moving Block System
Signalling in 25 KV RE Section	Signalling in 25 KV RE Section
Electronic Interlocking (EI)	Electronic Interlocking (EI)- principles (Kyosan, Hitachi, Siemens, Alstom), Configuration, Application logic, FAT, SAT, Technical Service Approval Application (TSAA)
NA	Centralized Traffic Control (CTC), Train Management System (TMS)
NA	GeM, IREPS Procurement, SAP Asset Management
NA	Air conditioning of SER, TER, ALH/RH
Failure Analysis & Investigations.	Failure Analysis, Investigations and Scheduled & Preventive Maintenance
NA	Signalling Data Handbook (S30)
NA	Preparation of S&T Estimates, Tender document and Contract management

5. <u>Telecommunication</u>

Existing	**Proposed**
Train Traffic Control	Control Communication, OFC based, VoIP based, Emergency control Communication, SPT, Voice Logger, TPC Control, SCADA & PSI connectivity over OFC, Total Communication Failure

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Plesiochronous Digital Hierarchy (PDH), Synchronous Digital Hierarchy (SDH)	PCM-TDM Principles, Types of MUX, DWDM, Network Topology, Synchronous Digital Hierarchy (SDH) principles and SDH Equipments, DNS
Optical Fibre Communication (OFC)	OFC Communication Systems, OFC Splicing, Measurements and laying practices
VHF Communications, Mobile Train Radio Communication (MTRC)/GSM-R, WPC Clearance	VHF Communications, Mobile Train Radio Communication (MTRC)/GSM-R, WPC Clearance
Underground cable system	Outdoor and Indoor Telecom cable system, Laying practices and precautions, Data communication cable
Data communication & IP Networks, Network Management Systems, Networks for FOIS	Data communication & IP Networks, IP-MPLS, FOIS, COA, DFIS, CMS, NMS, Wi-Fi, Internet, Calculation of minimum bandwidth requirement, VPN, Cyber security and Wireless security
Digital Electronic Exchanges, ISDN, Concept of GPS	Digital Electronic Exchanges, ISDN, Types of phones :Analog, DLT, Digital, IP & Video phones, Creation of Hot line with IR, Concept of GPS
NA	Master Clock System, CCTV Systems, Voice Recording Server, Access Control System, Fire Alarm System
48V DC SMPS Power Supply	48V DC SMPS Power Supply
NA	Basic Concepts of Artificial Intelligence, Internet of Things (IoT), Cloud Computing, Geo Tagging
NA	Telecom Handbook

A-6

Revised syllabus for Written Exam for promotion from Sr. Executive/Executive (E0/E1) to JM/JPM (S&T) (E2)

1. **General**

Heat, Temperature & Work, Expansion of solids, liquid & gases.

Simple motors & Dynamos, Principle of working of Transformer, Relay, Fuse, Circuit breaker.

AC & DC Power supply, Rectifiers, DC-DC Converter, Inverter.

2. **Fundamental Engineering & Applied Technology**

Magnetism, Electricity, Sound, Electrical Machinery and Circuits, Fundamental Electronics & Electronic Circuits, Power Supply Equipment and Systems, Protection Systems against Lightning & Surges, Principles of Optics & Optical Fibre Cable, Principles of Digital Electronics, Digital Devices and their Applications, Data Communications Principles & Information Technology, Basic LAN/WAN & Networking, Intranet/internet.

3. **Rules & Manuals**

DFCC G&SR, IR Signal Engineering Manual, IR Telecommunication Manual, IR AC Traction Manual, IR P-Way Manual, DFCC Block Working Manual, DFCC Schedule of Dimensions, DFCC Operation Manual, DFCC Works Manual, Disaster Management, DFCC Accident Manual, Rules for Opening of Railways, Store Procurement Manual & Policies

4. **Signalling**

Existing	**Proposed**
Basic Concept of Signalling	Basic Concept of Signalling
Principles of Interlocking	Principles of Interlocking, Signalling Interlocking Plan, Signalling route initiation upto complete arrival of train and route release principles
Selection Circuits & Control Table	Selection table/Control Table
Signalling Relays & Cables, DC Track Circuit, Axle Counters, Electrical Point Machine, Power supply arrangements for Signalling, DG Set, LC Gate, Datalogger	Signalling Elements-Relays, Cables, LED Signal, Electric Point Machine, Axle Counters (HASSDAC & MSDAC), Integrated Power Supply, UPS, Batteries, DG Set, Remote Diagnostic and Predictive Maintenance System (RDPMS), Data Loggers, LC Gates etc
Block Signalling (Block Proving by Axle Counter using	Intermediate Block Signalling (IBS), BPAC,UFSBI

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UFSBI, Intermediate Block Signalling (IBS)	
British Interlocking with Metal to Carbon Relays	British Interlocking with Metal to Carbon Relays
Colour Light & Automatic Signalling	Colour Light & Automatic Signalling
NA	Earthing, Lightning & Surge protection arrangements
Train Protection & Warning System (TPWS), European Train Control System (ETCS)	Train Protection System- TPWS, Kavach, Automatic Train Control System: Cab Signalling; on-board and trackside equipment, Interface with rolling stock; ECTS-Level 1,2,3, Concept of fixed block and moving Block System
Signalling in 25 KV RE Section	Signalling in 25 KV RE Section
Electronic Interlocking (EI)	Electronic Interlocking (EI)- principles (Kyosan, Hitachi, Siemens, Alstom), Configuration, Application logic, FAT, SAT, Technical Service Approval Application (TSAA)
NA	Centralized Traffic Control (CTC), Train Management System (TMS)
NA	GeM, IREPS Procurement, SAP Asset Management
NA	Air conditioning of SER, TER, ALH/RH
Failure Analysis & Investigations.	Failure Analysis, Investigations and Scheduled & Preventive Maintenance
NA	Signalling Data Handbook (S30)
NA	Preparation of S&T Estimates, Tender document and Contract management

5. Telecommunication

Existing	Proposed
Train Traffic Control	Control Communication, OFC based, VoIP based, Emergency control Communication, SPT, Voice Logger, TPC Control, SCADA & PSI connectivity over OFC, Total Communication Failure
Plesiochronous Digital Hierarchy (PDH), Synchronous Digital Hierarchy (SDH)	PCM-TDM Principles, Types of MUX, DWDM, Network Topology, Synchronous Digital Hierarchy (SDH) principles and SDH Equipments, DNS
Optical Fibre Communication (OFC)	OFC Communication Systems, OFC Splicing, Measurements and laying practices
VHF Communications, Mobile Train Radio Communication (MTRC)/GSM-R, WPC Clearance	VHF Communications, Mobile Train Radio Communication (MTRC)/GSM-R, WPC Clearance
Underground cable system	Outdoor and Indoor Telecom cable system, Laying practices and precautions, Data communication cable
Data communication & IP Networks, Network Management Systems, Networks for FOIS	Data communication & IP Networks, IP-MPLS, FOIS, COA, DFIS, CMS, NMS, Wi-Fi, Internet, Calculation of minimum bandwidth requirement, VPN, Cyber security and Wireless security
Digital Electronic Exchanges, ISDN, Concept of GPS	Digital Electronic Exchanges, ISDN, Types of phones :Analog, DLT, Digital, IP & Video phones, Creation of Hot line with IR, Concept of GPS
NA	Master Clock System, CCTV Systems, Voice Recording Server, Access Control System, Fire Alarm System
48V DC SMPS Power Supply	48V DC SMPS Power Supply
NA	Basic Concepts of Artificial Intelligence, Internet of Things (IoT), Cloud Computing, Geo Tagging
NA	Telecom Handbook

JM I/S&T/Co

Syllabus for CBT from Jr Executive to Executive (OP&BD) Promotion

A. General Studies:

i. History and development of Indian Railways/DFCR.
ii. Organization of Indian Railways/DFCR.
iii. Various departments of Railways /DFCR , their functions,
iv. Various organizations working under Ministry of railways/ DFCR. Future strategies
v. Operating department organization at various level, its functions and objectives etc.
vi. Safety in train operation, CRS and functions

Establishment,

i. Organization and functions.
ii. Leave rules, TA& DA rules,
iii. Main provisions of Service Conduct Rules, 1966,
iv. HWPR(HOER) and preliminary idea of Conduct D&AR of DFCCIL, New pension scheme, RTI

B. Transportation - (Lower Transportation)

1. Important Definitions of Chapter – 1 of G & SR.
2. Classification of stations, Minimum signals at different classes of stations.
3. Signal –

i. Multiple aspect Color Light signals,
ii. Fixed Signal – Approach, Departure, Subsidiary – description and identification of each signal, distinguishing marks on signal, aspect and indication of signal,
iii. Working of signal –electrically
iv. Hand signal – upkeep and use of hand signal in train working and during shunting
v. Detonating signal – description and use in thick & foggy weather and in accident/obstruction, VTO, Fog signal post.

4. Points –

i. Types of points (Facing, Trailing, Trap, Permanent Locked etc.) and their component.
ii. Securing of point, clamp and padlock, key locking, facing point lock, Track circuits, Axle counter.
iii. Working of point by mechanically through rodding or double wiring or by electrically through motor operation, use of crank handle.
iv. Description of Point Indicator, Trap indicator, signal repeater, route indicator, SLB, BSLB etc., Indications in cabin
v. Working of trains during failure of point, signal or other S&T gear, precaution during failure, Disconnection and Reconnection, precaution during disconnection
vi. Brief knowledge about various system of working on Indian Railways/DFCCIL, Absolute Block System – Essentials, Condition for granting line clear and taking off signals

5. **Interlocking –**

i. Definition, types of interlocking, standards of interlocking, Key transmitters, Mechanical/Electrical Slotting.

6. **Isolation –**
   i. setting of points and cross-over by means of snag dead ends, sand humps, derailing switch
7. **Shunting –**
   i. Shunting rule at single and double line station,
   ii. precautions and use of fixed signal during shunting,
   iii. control of shunting,
   iv. prohibition of shunting.
   v. Securing of vehicles in running line and non-running line, vehicle running away.
8. Procedure for reception and dispatch of trains at different classes of stations on single and double line. Reception of trains on obstructed or non-signaled line, dispatch of train from non-signaled line or from a line having common starter signal,
9. Working of trains during failure of block instrument, Working of train without Guard/Brake-Van,
10. TSL working,
11. Sending of Engine/train in to obstructed block section.
12. Action to be taken when–
   i. A train parts,
   ii. A train is to be divided in the block section,
   iii. Fire on a vehicle,
   iv. Patrolman becomes overdue,
   v. Abnormal conditions reported on track,
   vi. Runaway train,
   vii. Thick & Foggy weather,
   viii. Hanging part in the train,
   ix. Hot axle in the train,
   x. Falling goods from wagon,
   xi. train passing without TL/TB.
   xii. regarding complete arrival of train,
   xiii. clearance of fouling mark,
   xiv. reversal of point,
   xv. using of Signal & Track Block through VDU,
   xvi. ensuring of normal position of signal and indication after arrival of train,
   xvii. watching of train passing through cabin,
   xviii. exchanging of signal with station staff/train crew
13. Working of Level Crossing Gates under normal and abnormal circumstances, Gate working rules, equipment's.
14. Means of communication and their use.
15. Train Signal Register, Line Concurrence book, Private Number book, Bell code signals, Engine whistle codes, Brief idea about Caution order and other important paper authorities
16. Assurance Register.

C. TRANSPORTATION - (COMMERCIAL)

i. Basic knowledge of Goods sheds,
ii. Papers used at Goods shed,

iii. Precautions during loading and unloading at Goods shed,
iv. Packing, Labelling & Marking
v. Role as a railway man to reduce claims, Child protection Act.

D. ELECTRICAL

i. General idea of electrified section, important component and their use, precaution during shunting,
ii. operation of isolator switch, Local and power block.

E. MECHANICAL

i. Brief idea of braking system.
ii. Difference between Vacuum brake and Air Brake system, Advantages of Air Brake System.
iii. Working of Single Pipe and Double Pipe Air Brake System.
iv. Continuity test and its importance,
v. Various components of vacuum brake system and air brake system.
vi. Brake Power and Brake Power Certificate,
vii. Causes of Brake Binding and its releasing,
viii. Flat tyre and its movement
ix. Brief idea of goods stock,
x. important under gear component and their use,
xi. different types of couplings
xii. method and precaution of attaching/detaching of vehicle.

F. SAFETY MANAGEMENT

Accidents –

i. Definition, Classification
ii. Consequential & other Train accidents
iii. Indicative Accidents – Class F, G & H
iv. Sounding of Hooter, Movement of Relief trains
v. Running of ART, ARME, RCRV Target Time
vi. Protection of line, Preservation clues at the site
vii. Fire on Trains,
viii. Hot Axle,
ix. Train Parting / Dividing
x. Disaster Management – Introduction, Golden Hour

G. INFORMATION TECHNOLOGY

i. Computerization in Indian Railways/DFCR
ii. Overview of various IT applications on Indian Railways/DFCR.

Syllabus for CBT from Executive/Sr Executive to Jr Manager (OP&BD) Promotion

A) General Studies:

a. History and Development of Indian Railways & DFCR, its prime objectives-Vision
b. Organizational Set up of Indian Railways, DFCR – Railway Board, Zonal Railway, DFCR Corporate, Divisional & DFCR Corridor Level & Station/Unit/ Depot Level
c. Organizational Set up of Traffic Department/OP&BD – Role of Operating, Commercial Department.
d. Control Department – Structure, Role, Importance and Functions in Operations.
e. Safety Department – Role, Importance and Functions in Railway/DFCR Operations, CRS: Organization, Importance and Functions
f. Official Language Implementation – Importance – Various Incentives for qualifying in Hindi proficiency

B) Transportation -(Lower Transportation): G&SR, & Operating manual

a) DFCR-G&SR Rules, Indian Railways General Rules
b) **Definitions:** DFCR- G&SR
c) Signals:

i. Evolution of Signals, Type of Signals
ii. Fixed Signals in Multiple Aspect Territory
iii. Distant, Inner Distant, Combination of Distant Signal with Last Stop Signal &
iv. Gate Stop Signal
v. Home, Inner Home, Routing Home
vi. Starter, Rear Starter, Inter Starter,
vii. Advanced Starter
viii. Calling-on Signal
ix. Shunt Signal – Types
x. Gate Stop Signal – with & without 'G' Marker,
xi. Intermediate Block Stop Signal
xii. All Hand Signals & their Occasions
xiii. Fog/Detonating Signal, Fog Signaling, Warning Signal & Demo
xiv. Indicators – Point, Trap, Route
xv. Boards – Warning Boards (Goods, Shunting & Station),
xvi. Shunting/Block Section Limit Board, Caution & Termination Indication Boards, etc.
xvii. Points & setting of Points,
xviii. Failure of all Signals-Reception & Departure Stop Signals
xix. Passing Intermediate Block Stop Signal at 'ON'
xx. Passing Gate Stop Signal at "ON"
xxi. Reception on Obstructed/ Non-Running/Non-Signaled Road/Line
xxii. Dispatch from a Non- Running / Non-Signaled Road/Line, a line out of group of lines with Common Starter
xxiii. Isolation & Interlocking
xxiv. Panel and their use. Lever, RRI, EI & VDU – Parts & Functions

d) Working of Trains generally:
Systems of working

i. Conditions and precautions for granting line clear and clearing back section
ii. Important papers, P.No. Sheet, TSR/eTSR and precautions while using them.
iii. Working of trains in Thick and foggy weather.
iv. Procedure for draw ahead of train up to fouling mark when fouling mark is not clear
v. Procedure for draw ahead of train up to last stop signal when train waiting for line clear
vi. Engine Whistle codes
vii. Procedure for put back of signals
viii. Standard Time
ix. Speed-Maximum Permissible Speed & Booked Speed
x. Timetable (WTT), Speed over Facing Points
xi. Engine Pushing, Pushing back in absolute and automatic block system
xii. Trains without Guard / BV / Guard & BV
xiii. Whistle Codes & Bell Codes
xiv. Working of Material Train & Track Maintenance Machine

e) Control & Working of Stations:

i. General duties
ii. SWR-Contents, P. Way, Rule Diagram & OHE sectioning diagram-Rules for working in Electrified Section- Appendix 'G'
iii. Shunting – Definition, Types, Control & Supervision of Shunting, Shunting on Gradients, Shunting Authorities, Shunting Techniques to maintain fluidity in Big Yards Goods measures to prevent accident during shunting movement
iv. ODC movement, Marshaling
v. Securing of Vehicles /Engine, Escaping of Vehicles– Stabling at Station, Train Stalled in Mid-section

f) Duties of SM in case of

i. Person run over cases, Cattle run over cases
ii. Obstruction in block section
iii. Patrolman delayed in block section, Train delayed in block section, Rail fracture, Loco pilot reporting any abnormal condition in block section, OHE failure, Traffic, Engineering, Power Block
iv. Track machine, Passing of train without tail lamp / tail board
v. In case of serious accident, Signal passing at danger by Loco Pilot
vi. Bursting of points, Fire on train
vii. Breach of block rule, Sabotage and train wrecking

viii. Threat perception, Working of Tower wagon, Trolley, Motor trolley, lorry.
ix. Staff / passengers creating nuisance in station premises.
x. Safety equipment's, boards,
xi. Registers maintained at station.
xii. Safety counselling and monitoring, Safety categorization, safety meetings
xiii. Exchanging of hand signals with train crew
xiv. Responsibility of Station Master regarding punctuality
xv. Use of crank handle, Overhauling, cable maggering, NI work and

g) **Working of Level Crossings –** Types of LC, Classification– Working at Manned Non-Interlocked LC-Failure of LC, Abnormal working at LC.

h) **Automatic Block System – S/L & D/L** –

i. Salient Features – Sequence of Aspects of Automatic Signals, Establishing Direction of Traffic, etc.
ii. Passing Signals at 'On'
iii. Various Authorities to Proceed Abnormal Occasions – Panel/VDU Failure, Prolonged failure of Signals, Failure of Both Signal & Communication, Sending Relief Engine, Single line working on D/L, Movement against DOT(Direction of Traffic) , etc.
iv. Shunting in Automatic Territory
v. Competency Certificate
vi. Modified Semi-Automatic Stop Signal Working

C) BLOCK WORKING RULES

a) DFCR-Block Working Manual & Forms

b) Block Instruments:

i. Single line and Double line
ii. Parts & Functions
iii. Precautions before granting/asking Line Clear, before closing the Block Section, Testing before Taking over charge
iv. Failure Occasions – Restoration by S&T Officials, SMs themselves,
v. Temporary Single line working on Double Line
vi. Train dividing & Train parting
vii. Authority to Proceed without Line Clear-Issue & circumstances, Sending assisting engine in obstructed Block section

D) Transportation - (Higher Transportation)

i. Speed and Running Time, Section capacity, Throughput, Goods train operation, Wagon Turn Round, Operating Statistics, Loco utilization,
ii. Planning - Significance and types of planning, planning procedure, planning for increasing the line capacity, planning for yard

remodeling,

iii. ESP, SIP, DPR. IRPSM, Long haul Operation
iv. Staff Management, Bio-Data Register, Roster assigning
v. Inspection – Types, objective, follow-up actions.

E) Transportation - (Commercial & Accounts)

i. Types of Wagons – Carrying Capacity, Forwarding notes, its types and importance, Working hours and business hours and restrictions.
ii. Movement of Wagon Loads, Priority Schedule, Weigh Bridge-Weighment & Re-Weighment, Punitive Charges
iii. Loading of Wagons, Sealing, Riveting & Locking
iv. Unloading of Wagons, Reporting of Discrepancies, Maintenance of DD Register
v. Open Delivery & Assessment Delivery
vi. Rebooking & Diversion
vii. Unconnected & Unclaimed Goods, their disposal
viii. Delivery in the absence of RR
ix. Demurrage, Wharfage and Stacking procedure
x. Sidings, Liberalized Siding Policies, GCT Policy
xi. Market prospecting organization, Freight Incentive Schemes & Transportation Products, Container Service
xii. Forwarding Note – Execution
xiii. Railways Act, 1989 – Important Sections
xiv. Outstanding & Clearance of Outstanding
xv. Under charges, Over charges – Disposal & delivery of Parcels Outstanding & clearance
xvi. Preparation of Goods Returns including Balance Sheet & submission EDP, GST
xvii. Balance sheet: Goods, Parcel, e-balance sheet etc.

F) S&T:

i. Different Types of Interlocking(Rudimentary, Lever, Panel, RRI,EI and KAVACH)-Basic knowledge.
ii. SER/Relay Room Double Key Lock Register
iii. Block Instrument Double Key Lock Register
iv. Signal, Block, Failure & Inspection Register
v. S&T (NM), Form-1
vi. Failure Advice & Joint Restoration Memo
vii. Route Release Memo, etc. Joint Inspection of Points & Crossings with Executive/Sr Executive Civil – Schedule, Observations,
viii. Signal Sighting Committee – Sighting Distance of various Signals-Focusing, Shifting of signals
ix. Panel EI - Resetting of Route/BPAC, LVR

G) Engineering:

i. Elementary Knowledge of All Types of Track Machines, Types of Blocks & Working of Track Machines,
ii. Types of Track Defects – Slack/Rough running, Lurch, Buckling, etc.
iii. Types of Engineering Works - CTR, DSW, TRR, TSR
iv. Station Yard Maintenance-Removal of rank vegetation, Prevention of
trespassing, Drainage Improvements in Track circuited yards
v. Blocking of Running Lines, Precautions,
vi. Blocks – Types, Integrated Block & Corridor Block,
vii. Short and Long duration works,
viii. Action in case of weather warning messages

H) Electrical:

i. Basics about AC Traction, Elementary Knowledge of OHE
ii. Types of Power Block-Precautions & Procedures, Working of Tower Wagon
iii. OHE Sectioning Diagram, FP, SSP, SP, Sector, Sub-Sector, Elementary and Neutral sections & Boards Reporting of abnormalities and action to be taken.
iv. Operation of Isolator Switches, Authorized Persons
v. Types of Power Block, Precautions & Procedures, Power Block Registers
vi. Operation of Rotary Switch

I) Mechanical:

i. Rolling Stock – Features & Specifications how it rolls on Track – Track Bound,
ii. Locomotives - Kind, Features and Specifications
iii. Examinations - kinds, Things to be observed and Specifications, ROH, IOH, POH of Rolling Stock
iv. Brake System – Working of Air Brake System – Hand Brake in Wagons, GDR Check,
v. Abnormal occasions – Flat Tyre, Brake Binding, Hot Axle, open door etc.
vi. Brake Power Certificates – Various kinds of Coaching & Freight BPCs, Guard and Loco Pilot Check-Clearance from IMS station, ELB, Coupling
vii. Crew Management- CMS,

J) SAFETY MANAGEMENT

i. Accidents – Definitions, Threshold Value, Classification, Reporting, Assistance Protocol.
ii. Consequential & other Train accidents
iii. Indicative Accidents – Class F, G & H
iv. Accident Management- Sounding of Hooter, Movement of

Relief trains

v. Chain of command during accident, Running of ART/SPART, ARME/SPARME, RCRV, Break down Special, Target Time,
vi. Protection of line, Preservation of clues at the site
vii. Various Accident Forms,
viii. Duties of SM, Train Managers, LP, Controller and Supervisors of various department in case of Serious Accidents
ix. Person falling out / knocked down by Trains – Duties of Train Manager & SM
x. Prima-facie cause of accident, Reading and measurement at accident site by Supervisors and preparation of Joint Accident enquiries, Levels of Enquiry
xi. Disaster Management – Introduction, Various Organizations, Developments on DM at National level, Golden Hour, DM Plans – at Corridor & Corporate levels, Various Telephone Nos. of Authorities to be used in requirement of assistance. Working of trains during disasters (Floods, Cyclones, and Earthquakes etc.)

K) **ESTABLISHMENT**

i. Main provisions of DFCR Service Conduct Rules

ii. Leave - their kinds and rules, Leave encashment Rule.
iii. Pay & Allowances - Entitlements, Rules regarding TA, DA, Night Duty Allowance, Overtime and their curtailment, Contingency charges and Composite Transfer Grant.
iv. Duty Roster - Description and classification, statutory provisions, periodical rest, long-on, short-off, split shift, penalty for violation of HOER, Job analysis procedure
v. D& AR – Brief Introduction-Standard Forms, Provision under Discipline and Appeal Rule 1968, Definition of various authorities, suspension, Defense Counsellor, Principle of natural justice, speaking orders, procedure for imposition of minor and major penalty, appeal, revision and review, special attention on provision under section 14(4), NIP, facilities during suspension
period. How to Conduct an Enquiry & Conduct, Discipline & Appeal Rules of DFCCIL.
vi. NPS, relevant factors and calculation, benefits Insurance etc.
vii. Workmen Compensation Act 1923, Payment and Wages Act 1936, Industrial Dispute Act 1947, RTI, SBF, Disability act 2012 and 1995, Confidential Report (APAR).

L) **Stores** –

Functions - Indenting, Accountal, Issue/Disposal of Consumable & Non consumable stores, T&P items, Dead

stock register, Various Books & Forms Stock sheet. Procurement

M)INFORMATION TECHNOLOGY

i. Computerization in Indian Railways & DFCR
ii. FOIS, RMS, TMS, ICMS, CMS, WILD, DFIS, BMS, etc. an overview
iii. COA – Introduction on Software, Hardware and Train charting, Computerized TSR

Syllabus (Professional Portion) for Promotion to E0 Level in Mechanical Department

Section 1: EnHM

- Quality Management System (QMS 9000-2015)
- Solid waste management Rules
- Hazardous waste management.

Section 2: OCC Working & Operations Management

- Woking timetable
- Working of control office
- Action taken during en-route problems
- Liasioning with Railways for Problem solving.
- Data Recording

Section 3: Mechanical Engineering Fundamentals

- Applied Mechanics: Various Engineering Materials Fatigue, hardness, corrosion and surface finish.
- Temp. & its measurement with conversion of units
- Heat and work, expansion of solid, liquids and gases
- Braking: Mechanical, Hydraulic and Pneumatic
- Mechanical Trades: Fitting, Welding, Electrician, Machining, Turning & Boring etc.
- Joining of Metals-Temporarily and permanent.

Section 4: Information Technology

- Familiarity with Personal Computer specs, Processor, RAM, Hard Disk, Floppy, CD, Pen Drive and multimedia etc
- Basic MS Word, Excel and power point
- General information on various portals used in DFCCIL including FMM, E-office, DFIS

Section 5: Railways and Wagons

- Different types of wagons used on Railways
- Components of wagons (Couplers, Brakes, Gear, SAB, DV, LSD, Brake beam etc.)
- Air Brake System-Twin pipe, Single pipe BMBC)
- Maintenance pattern of freight trains examinations, including CC rakes, and Types of BPC
- Air Brake Testing WITH RTR and engine 'A' Dimension and 'E' dimensions
- Knowledge of ROH, POH, NPOH and their periodicity
- Functions of Mechanical Engineering Department in DFFCCIL and Role of Supervisor in fields for handling of en-route problems.
- Hanging parts

Section 6: Safety and Disaster Management

- Knowledge of hot box, train parting, brake binding etc.
- Role of Mechanical supervisor at site of accident.
- Locations of DFCCIL ART and 140 Ton cranes over Indian Railway
- Causes and prevention of Hot Box
- Personal Safety while on duty

Section 7: Tools and Equipment

- Various types of tools and their uses during wagon maintenance, Necessity of calibration of gauges and measuring equipment.
- Gauges of CBC, Air brake, Bogies etc.

Section 8: Accident Analysis

- Role of Supervisor regarding accident site measurements (Engineering, Wagon/Coach, Loco, Signal, etc.).
- Knowledge of Wagon readings as per latest standard Performa of Railway.
- Accident root cause analysis and preservation of facts & clues.
- Knowledge of Speedo graph of Loco, Register maintained by Engg for P way and points and crossings.

Section 9: New Technology over DFCCIL

- General Knowledge of Wayside Equipment: OMRS, WILD, MVIS, HABD and RFID reader etc.

Syllabus (Professional Portion) for Promotion to E2 Level in Mechanical Department

Section 1: EnHM

- International standards:
- Quality Management System (QMS 9000-2015), Environment Management System (EMS 14001) & Occupational Health and Safety Assessment Series (OHSAS 45001)
- Solid waste management Rules
- Hazardous waste management.
- Water policy of Indian Railways

Section 2: OCC Working & Operations Management

- Woking timetable
- Working in control office
- Action taken during en-route problems
- Liasioning with Railways for Problem solving.
- Data Recording

Section 3: Mechanical Engineering Fundamentals

- Applied Mechanics: Various Engineering Materials and their properties, Bearings, stress and strain, Fatigue, hardness, corrosion and surface finish.
- Temp. & its measurement with conversion of units
- Mechanics velocity & acceleration, work done & horsepower etc.
- Heat and work, expansion of solid, liquids and gases
- Elementary knowledge of Internal Combustion Engines, Gas turbine
- Heat Recovery, Thermal Efficiency, Supercharging, and Intercooling
- Braking: Mechanical, Hydraulic and Pneumatic
- Ohms law, coulombs law Faraday law, WheatstoneBridge Principle voltage, current and resistance, wet and dry batteries power factor
- Simple motor and dynamos principle& working, transformer, relays, fuse, circuit breaker
- Power supply AC & DC distribution.

Section 4: Information Technology

- Familiarity with Personal Computer specs, Processor, RAM, Hard Disk, Floppy, CD, Pen Drive and multimedia etc.
- Basic MS Word, Excel and power point
- Basic local area network, servers, Hubs, Switches, structured cabling, Nodes, Network applications.
- Using Internet Email, Browsing, searching

- General information on various portals used in Indian Railway and DFCCIL including GEM, UDM, CMM, IREPS, FMM, E-office, DFIS

Section 5: Railways and Wagons

- Different types of wagons used on Railways
- Components of wagons (Couplers, Brakes, Gear, SAB, DV, LSD, Brake beam etc.)
- Air Brake System-Twin pipe, Single pipe BMBC
- Maintenance pattern of freight trains examinations, including CC rakes,
- Air Brake Testing: test rig; SWTR, RTR, 'A' Dimension and 'E' dimensions
- Knowledge of ROH, POH, NPOH and their periodicity
- Familiarity with IRCA part III
- Latest Design improvement in wagons for improving speed performance.
- Functions of Mechanical Engineering Department in DFCCIL

Section 6: Safety and Disaster Management

- Prevention of hot box, train parting, brake binding, etc.
- Classes of ART
- Accident Classification
- Duties of first official to reach accident site
- Duties of supervisor in case of accident
- ART ordering
- Cause of accident and prevention
- Accident enquiry
- Existing disaster management policy
- Mock drills
- Golden Hour

Section 7: Tools and Equipment

- Various tools and equipment related to wagon maintenance and calibration
- Gauges of CBC, Air brake, Bogies etc.

Section 8: Stores

- Tender work, contracts & store
- Inventory control, Procurement of Goods & Services

Section 9: Loco and Crew Management

- Loco power plan
- Engine utilization
- Crew planning
- Running Rooms and Crew lobby management
- Type of electric and diesel locos and their salient features
- Crew beats.

- Driver grading system

Section 10: Accident Analysis

- Accident site measurements (Engineering, Wagon/Coach, Loco, Signal, etc.)
- Accident root cause analysis
- Fishbone diagram
- Joint note preparation
- Accident enquiry

Section 11: New Technology over DFCCIL

- Way side Equipment: OMRS, WILD, MVIS, HABD and RFID reader etc.

Syllabus for CBT exam for promotion to the post of E-02 Junior Manager & E-0 (Executive) in Finance Department.

1.0 Syllabus:

1.1 Professional Knowledge : Candidates are required to possess reasonable professional knowledge in all the areas applicable to Finance Officers broadly categorized as under:

(i) Accountancy
(ii) Taxation
(iii) Financial Management
(iv) Auditing
(v) Banking and funds management

1.2 Accountancy: Generally Accepted Accounting Principles, Accounting and IND AS Standards, Principles of Accounting and Commercial Book keeping, Trial Balance, Annual Accounts, Depreciation, Provisions, Classification and Structure of DFCCIL Accounts. Preparation of Financial Statements i.e. Statement of Profit & Loss, Balance sheet etc.

1.3 Taxation: Income Tax Laws & Indirect Tax Laws i.e. GST, Compliance requirements.

1.4 Financial Management: Equity, Debt, PPP, Capital structure, Cost of Capital and Investment Analysis through various methods like Payback period, NPV, IRR etc., Budgeting (Railway Budgeting and DFCCIL Budgeting), Features of JICA and World Bank loans, Ratio Analysis, Fund Flow Statement.

1.5 Auditing: Internal Auditing and External Auditing (Statutory Audit and CAG Audit), Methods and Process of audit, Pre-Audit and Post-Audit, Financial Vetting and Scrutiny, System Auditing, Land Auditing.

1.6 Banking and funds management: Opening of Accounts in Banks, maintenance of stock of Cheque book, NEFT process, Deposit of receipts in Banks, handling of Money value instruments like FDRs, BGs, etc. Bank Reconciliation Statement, Funds Flow between Corporate Office and Field Units, Management of Surplus Funds, Management of SLAO accounts.

1.7 Working Knowledge on DFCCIL: The proposed examination being Departmental exam for promotion, candidates are also expected to possess reasonable knowledge of Working Rules and Procedures within DFCCIL. A separate section with questions will be on working rules and procedure, which may broadly include knowledge of DFCCIL's :

(i) Schedule of Powers
(ii) DFCCIL all Accounting Manuals
(iii) DFCCIL Works Manual & Procurement Guidelines

A-12

Indicative Syllabus for Various IT Posts

Part-II (96 Questions) as per relevant post

For Junior Manager (Information Technology) (E2):

i. **SAP - FI {Post Code - xx}:** - General Ledger / Accounting, Asset Accounting, Accounts Payable, Financial Closing, SAP Financials Basics, Reporting, Accounts Receivable, etc.

ii. **SAP - HCM {Post Code - xx}:** - Organizational Management Configuration and Organizational Management, Personnel Administration Configuration, Time and Attendance Management Configuration and Time and Attendance Management, SAP HCM Business Processes, Personnel Administration, Reporting and Analytics, Payroll Business Processes, Personnel Master Data, etc.

iii. **SAP ABAP {Post Code - xx}:** - ABAP Programming, ABAP Dictionary, Data Types and Data Objects, Classical User Interfaces, SQL Statements including update strategies, Enhancement and Modifications, ABAP Objects, Web Dynpro for ABAP, S/\P NetWeaver Overview, Internal Tables, ASAP Tools, etc.

iv. **SAP-Enterprise Portal {Post Code - xx}:** - Portal Components, Web Dynpro Development, Enterprise Portal client Framework, User Management, SAP NetWeaver Portal Fundamentals, Portal Runtime, Portal Services, Connector Framework, Web Dynpro Integration, Visual Composer, etc.

v. **SAP - PS {Post Code - xx}:** - Project Structures, Material, Cost & Budgets, Resources, Dates, Revenues and Payments, Reporting, etc.

vi. **SAP- BASIS {Post Code - xx}:** - System Landscape and Flow, Installation of SAP, User Administration, Client Administration, CCMS, Background Processing, Distributed R/3 Systems, Database Management, Performance Tuning, Transport Management System, Spool Administration, OSS and SNOTE Concepts, Patch Administration, SAP NetWeaver--BASIS, SAP Service marketplace, etc.

vii. **SAP- SD {Post Code - xx}:** - Sales Documents (Customizing), Shipping Process and customizing, Master Data, Pricing and condition technique, Sales Process, Organizational Structures, Cross-Functional (Customizing), Basic Functions (Customizing), Gilling Process and customizing, Availability check, etc.

viii. **SAP- MM {Post Code - xx}:** - Procurement Process, configuration using Procurement, Organization Levels and the Master Data, configuration using Organization Levels and Master Data, Purchasing Optimization, Inventory Management, Valuation and Account Determination, Logistics Invoice Verification, Material Requirements Planning, configuration using Inventory Management, Physical Inventory, etc.

ix. **Authorized CCNA / CCNP Certificate {Post Code - xx}:** - Physical layer links, Internet working, TCP-IP, Traffic Management, Network Fundamentals, LAN Switching Technologies, Routing Technologies, WAN Technologies, Infrastructure Services, Infrastructure Security, etc.

x. **Oracle Certified Professional (OCP), Java SES Programmer {Post Code - xx}:** - Java Class Design, Generics and Collections, Java Stream API, Use Java SE 8 Date/Time APJ, Java File 1/0 (NI0.2), Building Database applications with JDBC, Missing package and import statements, No file or directory path names for classes, Unintended line breaks, Code Fragments, Descriptive Comments, etc.

Syllabus of HR Department for CBT examination for promotion to E2 Level Jr. Manager in DFCCIL

1. **Introduction to DFCCIL** :- Organization Structure and other information about DFCCIL; Functions of HR department; Roles and Functions HR officers; Schedule of Powers in Establishment Matters.

2. **Recruitment Planning:-** DFCCIL Recruitment Policy & Recruitment Process in DFCCIL; Various Quotas in Recruitment viz SC, ST, OBC, EWS, PWD, Ex-Serviceman; Appointment on Compassionate Grounds in DFCCIL; Policy on Campus Recruitment in DFCCIL; Medical Norms for Appointment; Verification of documents and Antecedents;

3. **Reservation Rules and Reservation Rosters:-** Reservation Rules for reserved categories in Direct Recruitment and Promotions; Maintenance of Reservation Rosters for direct recruitment and promotion; Calculation of vacancies and backlog vacancies in reserved categories; Hours of Employment Regulation.

4. **Induction of Manpower on Deputation in DFCCIL:-** DFCCIL Deputation Policy; Equivalency of IDA and CDA Grades; Terms and Conditions of Deputation; DoP&T Guidelines on deputation.

5. **Man Power Planning** :- Book of Sanction; Manpower scenario in DFCCIL; Training(Learning) and Development Policy of DFCCIL; Types of Training; Categories for which training is mandatory; Importance of Training; Training Modules for different grades in DFCCIL.

6. **Promotion / Career Progression:-** DFCCIL Promotion Policy; Promotion Process in DFCCIL; Calculation of Vacancies with application of reservation; Zone of Consideration; Departmental Promotion in case of pending D&AR case; Sealed cover procedure; Rules governing CBT and its Processes.

7. **Labour Laws and Introduction to Various Acts : -** Payment of Wages Act; Minimum Wages Act; Employee Compensation Act; Industrial Dispute Act; Apprentices Act, 1971 & its Amendments; DFCCI NAPS Policy;Rights and Entitlements of PWDs; Contract Labour (Regulations and Abolition) Act, 1971; Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act 2013; Payment of Gratuity Act , 1972 and DFCCIL Employee Group Gratuity Rules.

8. **Right To Information Act, 2005 & Amendments**:- Definitions; Right to information and obligations of public authorities; Designation of Public Information Officers; Exemption from disclosure of information; Constitution of Central Information Commission & State Information Commission; Term of office and conditions of service; Removal of Chief

Information Commissioner or Information Commissioner and State Chief Information Commissioner or State Information Commissioner; Powers and functions of the Information Commissions, Appeal and Penalties; Monitoring and Reporting on the Implementation of the Act; Parliamentary Questions, dealing with VIP references.

9. **Pay and Fixation of Pay** :- IDA Pay Scales; DFCCIL Rules on Pay Fixation; DPE Guidelines on pay fixation of Board Level and Below Board Level Executives; Implementation of IDA Pay Commission(s); Pay Fixation of employees joining through Open Market Recruitment, Immediate Absorption, Deputation, on Promotion and on Permanent Absorption in DFCCIL.

10. **Perks and Allowances, Advances and other Facilities:-** Basket of Allowances for IDA employees; Perks and Allowances of DFCCIL; Allowanced to Deputationists; Lease Accommodation Policy; LTC Rules of DFCCIL; Rules for Travel Entitlement and other benefits including CTG on Transfer/Retirement, etc.; Various Advances available to DFCCIL employees; Medical Policy of DFCCIL.

11. **Seniority Rules :- DFCCIL Seniority Rules and** concepts of Residency on Promotion, Direct Recruitment and Permanent Absorption.

12. **Leave Rules** – DFCCIL Leave Rules & Joining Time; Leave Encashment Rules of DFCCIL; Leave encashment rules of CDA employees on deputation in DFCCIL.

13. **Legal Matters:-** Court Cases; Drafting of Para wise Comments; Filing of Affidavits; Appeals; Empanelment of Lawyers.

14. **Social Security Measures in DFCCIL**:- Pension Rules (NPS); Rules governing PF of DFCCIL employees, Settlement Benefits- Procedure; Calculation of Qualifying Service for Gratuity; Impact of D&AR Penalties on Retirement Benefits; Post Retirement Medical Scheme in DFCCIL; DFCCIL Employees Welfare Trust and Rules and Welfare Activities in DFCCIL.

15. **Performance Appraisal:-** Importance of Performance Appraisal, KRAs; APAR Module on Sparrow, Generation of APARs in Sparrow; workflows; DFCCIL APAR guidelines and mechanisms of representation available to employees.

16. SAP for Human Capital Management.

17. **Grievance Redressal Mechanism**:- DFCCIL Grievance Redressal Procedure; Follow-up of Employee Charter; Monitoring of CPGRAM.

18. **Conduct, Discipline and Appeal Rules** – DFCCIL Conduct Rules, Discipline and Appeal Rules of DFCCIL; Suspension; Subsistence Allowance, Major and Minor Penalties; Disciplinary Authorities; Procedure for Imposing Major & Minor Penalties; Action on Inquiry Report; Communication of Orders; Appeals and Review; Service of Orders & Notices; Power to relax time limit & to condone delay.

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Annexure-B

Syllabus for professional papers for Promotion to Junior Executive N-5 level in DFCCIL

Department	Content Description
Civil	• **Railway Track:** **Track Structure And Components** Classification of Dedicated Freight Corridors, the features of track structure of main lines and connecting lines for DFC, Cross Section of Track, Formation of DFC. **Ballast**- Ballast Specifications, Ballast Profile /Section/Depth of Cushion. **Sleepers & Fastenings**- General, Prestressed Concrete Sleepers, Sleeper Density, Fastenings on PSC sleepers. **Rail And Rail Fastenings**- Standard Sections of Rails, Identification of Different Qualities of Rails in the Field, Recommended Rail Section, Fastenings on PSC sleepers. **Buffer Stops**- Friction Buffer Stops, Parts of Friction Buffer Stop, Types of Buffer stops. Insulated joints, Switch Expansion Joint. **Track Structure On Bridges**- Rail and rail joints on Bridges, Steel Sleepers on Bridges, Provision of Guard Rails on Bridges and Tunnels, Provision of Guard Rails, Provision of Side Pathways and Walkways. **Points & Crossing**- Turnout, Turnouts used in DFCCIL, Key Parameters for Turnouts used in DFCCIL, Weldable Crossing, Check Rail, Type of Slide Chair used, Back Drive, Torsional Type Back Drive. • **Maintenance of Track:** Picking up of Slacks, Maintenance of yard lines and cleaning of yard drains, Super-elevation of Curve, Versine, Transition length, Inspection & Maintenance of Points and crossings, Hot Weather Patrolling. Cold Weather Patrolling. Monsoon Patrolling. Equipment of Monsoon Patrolmen. Rail Temperature, Rails corrosion, Rail Fractures, Rail Fracture Repair Stages, Rail Fracture reporting and investigation, Buckling of Track, Basics of Alumino-Thermic welding (AT Welding) & Flash Butt Weld • **Maintenance of Bridges & Inspection of Bridges:** Classification of Bridges (Important/Major/Minor) , Vertical Clearances & Free Board, Records of inspection, Passing by Bridge Inspection • **Safety Protocol and Engineering Indicators:** Work Involving Danger to Train or Traffic, Carrying out of Works in case of Emergency, Works which Obstruct the line, Temporary Engineering Fixed Signals- Location and Details, Procedure for Passing Trains at Stop Dead Restrictions, Procedure for Blocking Line for Engineering Purposes, Issue of Caution Orders to Drivers, Temporary Signals in Emergency, Permanent Speed Restriction Indicators, Indicators (General), Detonating Signals, Warning Signal-Descriptions, Use of Warning Signals. • **Transportation of Man And Material on Track, Working of Trollies, Motor Trollies And Lorries:** Distinction between Trolley, Motor Trolley and Lorry, Certificate of Competency Officials, Permitted to use Trollies, Motor Trollies and Lorries, Responsibility for Safe Working, Working on Track Circuited Sections and Sections Provided with Axle counter.
Electrical	• Basic knowledge about drawings and wiring diagrams. • Basic knowledge about various symbols used in Electrical Circuits and Panel Boards. • Basic knowledge of use, care and maintenance of servicing tools, measuring instruments and gauges used in electrical department. • Basic knowledge of various electrical parameters like voltage, wattage, current, capacitance, etc., and the measuring units. • Basic knowledge of 25 KV and 2x25 KV AC Traction system. • Basic knowledge regarding layout of 2x25 KV traction substation, SP, SSP, major components of TSS/SP/SSP. Basic concept related with protection and relay setting, RTU &

Syllabus for professional papers for Promotion to Junior Executive N-5 level in DFCCIL

	SCADA system, Typical earth resistance values of various installation, trouble shooting and isolating of various equipment used in TSS/SP/SSP. Basic knowledge of testing, charging and commissioning of various electrical equipment installed in TSS/SP/SSP. • Basic knowledge of Elementary Sections, LOP, sectioning, concept of power blocks, use of discharge rod, safety precautions during power block, tower wagon working, maintenance schedules of OHE and PSI equipment, At feeding arrangement at station and in S&T rooms. • Basic knowledge of earthing and bonding, type of bonds in EDFC and WDFC, safety requirements in electrical system, clearance as per ACTM. • Must have basic knowledge and outline working principle of investors, working of AC units, pumps, DG set etc. Working principles of secondary cells. Charging/discharging methods and testing procedures of various types of secondary cells.
Signal	• Signalling & Telecommunication fundamentals, EI/VDU; Digital Axle Counter; Kavach Components; LED Signals, Automatic Signalling System, Data logger system. • Point machine; Power Supply Systems (IPC/UPS), DG Set, Battery, Signalling & Telecom & Power Cables, Rectifier, DC-DC converter, Invertor, Solar system. • LC Gate equipment, OFC, GSM-R, Telephone System, VHF/Walkie-Talkie. • Procedure for attending S&T failures, Cable Testing & Meggering, Lightning protection, Earthing & Bonding, Location Boxes, Air Conditioning of SER, TER/TH. • Basic LAN/WAN & Networking, Intranet-Internet, Telephone Exchange.
Operating	• Introduction of Definitions: Station, Station Section, Station Limit, Facing point, Trailing Point, VTO, Block Section, Signal, Last Stop Singal, Fouling Mark. Train Line Clear, Shunting, Accident; Normal Operation of Points, Cranking of Points, Clamping of points, Gap in Points, Points and Trap Point Indicators, Working of Crank Handle, Obstruction in Point; Hand Signal: Exhibition of hand signal, Stop hand signal, Proceed hand signal, Proceed with caution hand signal, hand signal for shunting. Train parting: Description and working of fixed signal, Shunt Signals, Gate Signal, Automatic Signalling. Whistles Codes; Method of Shunting, type of shunting and shunting rules, marshalling of trains; Hand brakes on goods and coaching vehicles and their application; Securing of vehicles, Including the use of sprags, scotch blocks, chains and wooden sprags. Coupling of vehicles and wagons, Attachment & Detachment of pressure/hose pipes. Working of line verifications box, Ensuring of complete arrival of trains; Reception and dispatch of trains during NI and major failures, piloting of trains; Detonators: introduction & use, placement & life of detonators in single line, double line, in case of any danger, Fog; knowledge of hot axle, seizure of rolling bearing, brake binding, how to remove/release brake binding, hanging parts and it's securing and securing of doors. • Action to be taken in case of accident or unusual occurrence including obstruction of level crossing gates: Level crossing gates – Types, safety equipment of the gate, safety precaution during obstruction on the level crossing gates. Working of sliding booms, normal and abnormal gate working; Knowledge regarding all types of authorities, forms and their use and delivery, precautions to be taken when relief engine is being send in occupied block section, safety equipment; First-aid and firefighting.
Mechanical	• Mechanical organization structure of Railway & DFCCIL and system of operation of DFCCIL; Air Brake System, Air brake testing, brake binding and wagon numbering, CBC coupling and enroute problems. • Disaster Management, Accidents, Rescue & re-railing; Hooter Code, ART Coaches and Wagons & purpose of use; Types of wagons and their components; Tools & their use, Hand Brake and Empty Loaded Device, Hot Axle. • Types of examination, Type of BPCs, Vehicles Code; Guard Driver Check Report; Crew working and role of MTS; Welding, wheel defects, rolling in rolling out examination.

	• Introduction of Loco and major assemblies/components; Basic loco trouble shooting of under gear, Flasher light, Fire Extinguisher with location and where to keep fire extinguisher; Securing of Loco and attaching/detaching of locos: Securing dead & live loco; Basic duties of MTS in control (C&W & Loco), lobby and running rooms., shunting precautions, load releasing.

Annexure – C

SYLLABUS OF RAJBHASHA FOR CBT EXAM

क्रम सं.	हिंदी में	English
1	राजभाषा अधिनियम,1963	Official languages Act, 1963
2	राजभाषा नियम 1976	Official Language Rules,1976
3.	राजभाषा संकल्प 1968)	The Official Language Resolution 1968
4	राजभाषा के विषय में सांविधानिक प्रावधान	Constitutional Provisions regarding Official Laanguage
5	अष्टम अनुसूची की भाषाएँ	Languages in Eighth Schedule
6	हिंदी में प्रवीणता	Proficiency in Hindi
7	हिंदी का कार्यसाधक ज्ञान	Working knowledge of Hindi
8	विभिन्न पुरस्कार योजनाएँ	Various Incentive schemes
9.	वार्षिक कार्यक्रम	Annual programme
10	नगर राजभाषा समिति	Town Official Language committee
11	विभागीय राजभाषा कार्यान्वयन समिति	Departmental Rajbhasha Implementation Committee
12	हिंदी दिवस/ पखवाड़ा	Hindi Day/ Fortnight
13	हिंदी सलाहकार समिति	Hindi Advisory Committee
14	संसदीय राजभाषा समिति	Committee of Parliament on Official Language
15	कंप्यूटर में हिंदी	Hindi on Computer
16	राष्ट्रपति का आदेश, 1960	Presidential Order, 1960
17	'क', 'ख', 'ग' क्षेत्र में शामिल राज्य/संध राज्य क्षेत्र	State/Union Territories falling in the Region 'A",B'.'C'
18	केंद्रीय हिंदी समिति	Central Hindi Committee
19	पारिभाषिक शब्दावली	Glossary of Hindi Terms
20	हिंदी भाषा के विकास के लिए निदेश	Directive for development of Hindi