<u>**Syllabus for Deputy General Manager (S&T)**</u>
<u>**Vacancy Notice No. 04/2022**</u>

<u>**Domain Knowledge**</u>   ≈   **70%**

i) **Basic knowledge:** Role of Signaling in Railways, Role of Communication in Railway, System of Operation, Hazard Analysis, Principles of Interlocking, Control Table, Cab Signaling, Safety & Reliability Engineering, Data Communication & Networking, PDH & SDH Principles, Radio Propagation, Optical Fiber Communication, Satellite Communication, Computers & Data Administration, Cybersecurity, EMI/EMC

ii) **Technical Knowledge:** Signaling Relays and Cables, Colour Light Signals, Electric Point Machine, Train Detection Devices, Solid State Interlocking / Computer Based Interlocking, Automatic Train Control System, Traffic Control System, Power Supply, Telephone Exchange and Despatcher Telephone, Passenger Information Display system & Announcement System, Train Radio System (GSM, LTE-R, Wi Fi), Data Transmission System, Master Clock System

iii) **Application Knowledge:** Absolute Block Working, Automatic Block Working, Concept of Fixed Block and Moving Block System, Communication Based Train Control System (CBTC) and Grade of Automation, European Train Control System (ETCS- Level 1,2,3), Design Process including Signalling the layout & Network planning, Testing and commissioning.

iv) **Interfaces:** Interface with P.Way**,** Traction System**,** Rolling Stock

v) **Governance:** General Rules**,** Accident / Incident Investigation**,** International Specifications;

vi) **Project/Contract Management:** Procurement guidelines of various funding agencies (JICA, ADB, World Bank, Multi-Lateral banks, Public Procurement: Preference to Make in India, General condition of yellow book and red book contracts (FIDIC), Bidding process for works contract and consultancy contract.

<u>**General Awareness, English, Reasoning**</u>   ≈   **30%**

Syllabus for Deputy General Manager (IT)
Vacancy Notice No. 05/2022

Domain Knowledge   ≈   **70%**

1. Cyber Security related issues.

2. Development & management of intranet &Maintenance of website and Email servers, Database management and Administration.

3. Network and Lan Management, VPN Management.

4. CCTV, Telephone Exchange, Wireless access points, Biometric and other IT assets management.

5. Incident management, Backup & Restore management.

6. Server management (web Server, file server, application server, DC, ADC, radius server etc.)

7. Operating systems: Linux, Windows, mac OS, Android, IOS; Office Suites; Communication and collaboration tools.

8. Network security: Cloud security, malware analysis, intrusion detection, secure code development, data and file encryption.

9. Application and desktop software development: android /IOS software development kit, Android/IOS etc.

10. Oracle Primavera, unifier and other ERP suites.

11. Project/Contract Management**:** Public Procurement: Preference to Make in India, General condition of yellow book and red book contracts (FIDIC), Bidding process for works contract and consultancy contract.

General Awareness, English, Reasoning   ≈   **30%**

Domain Knowledge   ≈   **70%**

i) **Architecture of AFC and ticketing system:**
   - Fare Media (QR Code, NFC, EMV, NCMC, Card);
   - Station level equipment (Automatic Gate, Ticket Office Machine, Ticket Vending Machine, Automatic Ticketing Printing Machine, Station Computer Unit);
   - OCC level equipment including CCHS, External Interface (Payment Gateway, other transport system);
   - Open & Close loop system;
   - Data Communication and Networking;
   - Encryption & Security;
   - Cyber Security;
   - Advance Reservation System;
   - Power Supply,

ii) Design Process & Network planning, Testing and commissioning, Project Management, Contract Management including FIDIC Conditions of Contract, Maintenance management

iii) **Project/Contract Management**: Procurement guidelines of various funding agencies (JICA, ADB, World Bank, Multi-Lateral banks, Public Procurement: Preference to Make in India, General condition of yellow book and red book contracts (FIDIC), Bidding process for works contract and consultancy contract.

General Awareness, English, Reasoning   ≈   **30%**

Domain Knowledge   ≈   **70%**

1. **Basic knowledge:** Role of Signaling in Railways, Role of Communication in Railway, System of Operation, Hazard Analysis, Principles of Interlocking, Control Table, Cab Signaling, Safety & Reliability Engineering, Data Communication & Networking, PDH & SDH Principles, Radio Propagation, Optical Fiber Communication, Satellite Communication, Computers & Data Administration, Cybersecurity, EMI/EMC

2. **Technical Knowledge:** Signaling Relays and Cables, Colour Light Signals, Electric Point Machine, Train Detection Devices, Solid State Interlocking / Computer Based Interlocking, Automatic Train Control System, Traffic Control System, Power Supply, Telephone Exchange and Despatcher Telephone, Passenger Information Display system & Announcement System, Train Radio System (GSM, LTE-R, Wi Fi), Data Transmission System, Master Clock System

3. **Application Knowledge:** Absolute Block Working, Automatic Block Working, Concept of Fixed Block and Moving Block System, Communication Based Train Control System(CBTC) and Grade of Automation, European Train Control System (ETCS- Level 1,2,3).

4. **Life Cycle Management:** Design Process including Signalling the layout & Network planning, Testing and commissioning, Project Management, Contract Management including FIDIC Conditions of Contract, Maintenance management

5. **Interfaces:** Interface with P.Way**,** Traction System**,** Rolling Stock.

6. **Governance:** General Rules, Accident/Incident Investigation, International Specifications

General Awareness, English, Reasoning   ≈   **30%**

<div align="center">**Syllabus for Senior Manager/Manager (IT)**
Vacancy Notice No. 08/2022</div>

Domain Knowledge ≈ **70%**

1. Cyber Security related issues.

2. Development & management of intranet &Maintenance of website and Email servers, Database management and Administration.

3. Network and Lan Management, VPN Management.

4. CCTV, Telephone Exchange, Wireless access points, Biometric and other IT assets management.

5. Incident management, Backup & Restore management.

6. Server Configuration.

7. Management of Server, Backup of data.

8. Log Analysis.

9. Server web Server, file server, application server, DC, ADC, radius server etc)

10. Operating systems: Linux, Windows, mac OS, Android, IOS; Office Suites; Communication and collaboration tools.

11. Network security: Cloud security, malware analysis, intrusion detection, secure code development, data and file encryption.

12. Application and desktop software development: android /IOS software development kit, Android/IOS etc.

13. Oracle Primavera, unifier and other ERP suites.

General Awareness, English, Reasoning ≈ **30%**

Syllabus for Senior Manager/Manager (Ticketing Systems)
Vacancy Notice No. 09/2022

Domain Knowledge   ≈   **70%**

i)   Architecture of AFC and ticketing system,
  - Fare Media (QR Code, NFC, EMV, NCMC, Card);
  - Station level equipment (Automatic Gate, Ticket Office Machine, Ticket Vending Machine, Automatic Ticketing Printing Machine, Station Computer Unit);
  - OCC level equipment including CCHS;
  - External Interface (Payment Gateway, other transport system);
  - Open & Close loop system;
  - Data Communication and Networking;
  - Encryption & Security;
  - Cyber Security;
  - Advance Reservation System;
  - Power Supply.

ii) Design Process & Network planning, Testing and commissioning, Project Management, Contract Management including FIDIC Conditions of Contract, Maintenance management.

General Awareness, English, Reasoning   ≈   **30%**

Syllabus for Senior Manager/Manager (Contracts – S&T)
Vacancy Notice No. 10/2022

Domain Knowledge   ≈   **70%**

1.   Principle of Public Procurement.
2.   Type of work Contracts- Item Rate, Lump-sum, Cost plus contract.
3.   Type of consultancy contract: Time based, lump-sum.
4.   Type of Tenders- Open, Limited & Single Tender
5.   Eligibility criteria of tenders
6.   General condition of yellow book and red book contracts.
7.   Various source of selection of contractor/consultant including evaluation of tenders:

      Least Cost Selection, Quality Cost based Selection, Quality Based Selection
8.   Instructions to Bidders (ITB), bidding forms of different type of tenders.
9.   Arbitration & Dispute resolutions
10.   Procurement guidelines of various funding agencies (JICA, ADB, World Bank, Multi-Lateral banks.
11.   Public Procurement: Preference to Make in India
12.   E-tendering process.

General Awareness, English, Reasoning   ≈   **30%**

Syllabus for Senior Manager/Manager (Electrical)
Vacancy Notice No. 11/2022

Domain Knowledge   ≈   **70%**

Item	Description
General Electrical Engineering & its Railway Applications	- Power System & Analysis - Utilization of Electrical Energy. - Power System Protection & Switch Gear. - Electrical Machines. - Electromagnetic Theory. - Network Analysis. - Electrical Instrumentation. - Power Electronics & Drives. - Control Systems. - Building Electrical Works - Railway Traction Power Supply System - Various types of Overhead Equipment (OHE)

General Awareness, English, Reasoning   ≈   **30%**

Syllabus for Senior Manager (Rolling Stock- Bogie & Brake System)
Vacancy Notice No. 12/2022

Domain Knowledge ≈ 70%

1. Bogie system parts i.e. Bogie frame, Suspension, Wheel, Axle, Bearing, Centre pivot etc. material, function, design (Relevant International Standards)

2. Pneumatic System – Different type of Brakes in Rolling Stock, Adhesion, Slip-Slide, Brake blending etc concepts (relevant International Standards)

3. Rail vehicle dynamics – Ride Index, Derailment coefficient, Wheel off-loading, Vibration etc. (relevant International Standards)

4. Pantograph design (relevant international Standards)

5. Testing and commissioning w.r.t. Bogie, Brake, pneumatic system and Pantograph; Oscillation trials, Emergency braking distance (EBD).

6. Basics of Contract Management, FIDIC etc.

7. Tender evaluation and Contract Management principles with regard to design of Bogie & Brake System

General Awareness, English, Reasoning ≈ 30%

Syllabus for Senior Manager (Rolling Stock- Propulsion System)
Vacancy Notice No. 12/2022

Domain Knowledge ≈ 70%

1. Basics of electrical machines, electronics, power electronics etc. of Electrical engineering.

2. Design of Propulsion system including HV power collection, transformer, traction converter, traction motor and auxiliary converter etc. of EMU rolling stock (relevant International Standards).

3. Testing and commissioning of Propulsion system including HV power collection, transformer, traction converter, traction motor and auxiliary converter etc. of EMU rolling stock (relevant International Standards).

4. Speed vs Tractive Effort curve, Regenerative Braking, Power requirement & efficiency, Jerk, EMI/EMC, Temperature rise of electrical equipment etc. concepts (relevant International standards).

5. Basics of Contract Management, FIDIC etc.

6. Tender evaluation and Contract Management principles with regard Propulsion System

General Awareness, English, Reasoning ≈ 30%

Syllabus for Senior Manager (Rolling Stock- Depot)
Vacancy Notice No. 13/2022

Domain Knowledge ≈ 70%

1. Facilities, including the M&Ps, and their upkeep/maintenance in modern Depots/ Workshop for Railway/ Metro or similar industry
2. Machine tool design/ manufacture/ commissioning/ maintenance of heavy/ high precision conventional/ CNC machinery, for example cranes, milling/ turning centres, automated systems for assembling precision components, etc. in the railway or heavy/precision engineering or manufacturing industry
3. Testing & commissioning of high precision/ automated machineries
4. Standards and specifications, statutory compliances, etc. pertaining to railway or similar industry.
5. Type tests, Routine tests, Factory Acceptance Tests, etc.
6. Theory of machines, engineering measurements and metrology, machine tool design, industrial automation and robotic applications, NC/CNC machines, various types of drives/ power & control systems/ pneumatic & hydraulic systems, etc. that are used in machine tools, various types of sensors and actuators.
7. Basics of - analogue and digital electronics, PLC, PCB, microprocessors/ microcontrollers and their programming, electrical circuits, cables, relays & contactors.

General Awareness, English, Reasoning ≈ 30%

Syllabus for Assistant Manager (Rolling Stock- Electrical)
Vacancy Notice No. 14/2022

Domain Knowledge ≈ 70%

1. Facilities, including the M&Ps, and their upkeep/maintenance in modern Depots/ Workshop for Railway/ Metro
2. Modern state-of-the art Depot/ Workshop for Railway/ Metro.
3. Commissioning and testing of Rolling Stock
4. Commissioning and testing of Depot facilities and M&Ps.
5. Functioning of modern depots for railway/ metro
6. Standards and specifications, statutory compliances, etc. pertaining to Depots/ Workshop for Railway/ Metro
7. Type tests, Routine tests, Factory Acceptance Tests, etc.
8. Engineering measurements and metrology, various types of drives, power and control systems, MV/ LV power supply, electrical circuits, HV & insulation testers, cables, relays & contactors, batteries, environment control/ HVAC systems, cranes & hoists, traversers, induction heaters, various types of sensors and actuators.

General Awareness, English, Reasoning ≈ 30%

Syllabus for Assistant Manager (Rolling Stock- Electronics)
Vacancy Notice No. 15/2022

Domain Knowledge ≈ 70%

1. Facilities, including the M&Ps, and their upkeep/maintenance in modern Depots/ Workshop for Railway/ Metro
2. Modern state-of-the art Depot/ Workshop for Railway/ Metro.
3. Commissioning and testing of Rolling Stock
4. Commissioning and testing of Depot facilities and M&Ps.
5. Functioning of modern depots for railway/ metro
6. Standards and specifications, statutory compliances, etc. pertaining to Depots/ Workshop for Railway/ Metro.
7. Type tests, Routine tests, Factory Acceptance Tests, etc.
8. Engineering measurements and metrology, analogue and digital electronics, industrial automation, CNC machines, various types of drive and machine control systems, event recorders, IT and data network systems, optical fibre, PLC/ microprocessors/ microcontrollers and their programming, data readers, various types of sensors and actuators.

General Awareness, English, Reasoning ≈ 30%

Domain Knowledge ≈ 70%

1. Facilities, including the M&Ps, and their upkeep/maintenance in modern Depots/ Workshop for Railway/ Metro
2. Modern state-of-the art Depot/ Workshop for Railway/ Metro.
3. Commissioning and testing of Rolling Stock
4. Commissioning and testing of Depot facilities and M&Ps.
5. Functioning of modern depots for railway/ metro
6. Standards and specifications, statutory compliances, etc. pertaining to Depots/ Workshop for Railway/ Metro.
7. Type tests, Routine tests, Factory Acceptance Tests, etc.
8. Theory of machines, engineering measurements and metrology, common industrial machines & tools, industrial automation and robotic applications, NC/ CNC machines, welding equipment, wheel press, cranes & hoists, traversers, PLC, various types of drives, pneumatics/ hydraulic systems, various types of sensors and actuators.

General Awareness, English, Reasoning ≈ 30%

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Syllabus for DGM (HR)
Vacancy Notice No. 17/2022

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Domain Knowledge ≈ 70%

Item	Description
Human Resource Management	Human Resource Planning. Job Analysis & Job Description. Reservation Policies & Relaxations. Deputation /Absorption. Board level Appointments.
Wage & Establishment Policies	Pay Revision – IDA, CDA Dearness Allowance, HRA Allowances & Perquisites. Leave Rules, TA Rules
Human Resource Development	Training need analysis. Types of training. Training & Development analysis. Types of Performance Appraisals. Rules related to APAR/ACR, SPARROW.
Human Resource Information Systems	Database Management, Time & Labour Management, Payroll Functions, Employee Interface, HR Analytics.
Organizational Behaviour	Individual, Group & Team Behaviours. Motivational Theories. Leadership Theories.
Industrial Relations	Negotiations & collective settlements. Industrial Disputes.
Labour & Other Legislations	Industrial Disputes Act, Factories Act, Contract Labour (R&A) Act, Trade Unions Act EPF Act, ESI Act, Payment of Gratuity Act, POSH Act, RTI Act, New Labour Codes.
Conduct Rules	Conduct, Discipline & Appeal Rules

General Awareness, English, Reasoning ≈ 30%

Syllabus for Dy. CPM – Civil
Vacancy Notice No. 01/2023

Domain Knowledge ≈ **70%**

1. **Surveying: -**
   Tachometric surveying, Remote Sensing, GPS and GIS, Latest Surveying instruments and methods, Practical field applications in curve setting, alignment fixing etc.

2. **Construction technology: -**
   Guidelines for mix design High Performance concretes. Construction Equipment, Construction Quality inspection and testing, Quality control, Quality Assurances, Quality Certification, Safety in Constructions.

3. **Soil mechanics: -**
   Sub Soil Investigation - Method of Exploration, Geo physical and conventional Methods, Analysis of test reports, correlation with design.

4. **Land acquisition: -**
   Various Land Acts, Notification, Procedure, Organisation, Methods of Calculation etc.

5. **Bridge engineering: -**
   Site Investigations, Bridge hydrology, Geometry of Bridges, Steel, RCC, Pre stressed Road and Rail Bridges, prestressing systems and methods, Bearings Joint, Foundation, Construction and Erection, Codes of Practice.

6. **Project management: -**
   Basic forms of organisation, Project feasibility Repots, Role of Project Management consultant.

7. **Project scheduling – construction: -**
   Scheduling, Software in Constructions scheduling (MSP, Primavera, Construction Manager)

8. **Elevated structures: -**
   Precast construct ions, Casting Yards, Launching Schemes.

9. **Track: -**
   Basic Track Structure, Turnouts and crossing, curved track, Track alignment.

10. **Contracts: -**
    Tendering process, Administration/Performance of contract Responsibilities (Duties and Liabilities) of Principal & Contractor, Monitoring and Quality control/assurance, Settlement of claims − Advances, Bills, Extension for time, Extras & Variations, Cost Escalations. Security Deposit, Retention Money, Performance Bond, Liquidated Damages, Penalties, Statutory Requirements. Breach of contract, Dispute resolution, FIDIC conditions of contracts.

General Awareness, English, Reasoning ≈ **30%**

<p style="text-align:center"><u>**Syllabus for Manager (Database Administrator)**</u>
<u>**Vacancy Notice No. 02/2023**</u></p>

<u>**Domain Knowledge ≈ 70%**</u>

Item	Description
Oracle Application Installation & Administration	Implementation, Configuration, Maintenance, Troubleshooting and Upgrade of Oracle Applications R12 or later on Enterprise Linux/UNIX/AIX. Oracle Applications Database in 12.x and 19.x or higher versions. Architecture understanding, analysis and solving issues across multiple layers of the stack. AWR and ADDR reporting and required system analysis.
Middleware Components	Middleware components like Oracle WebLogic server, OID etc
Backups, Recovery, tuning, Database design	Oracle RDBMS internals, Backup & Recovery using RMAN Performance tuning, security configurations, logical and physical design of database of Enterprise environment and supporting critical production databases and applications and manage large databases. Installing, configuring, upgrading and administering different versions of Oracle Database, Automatic storage management, Disaster Recovery site. Upgrade and database migration from one platform to another using various tools like Oracle Data Pump, RMAN and TTS/XTTX. Managing Oracle Enterprise Manager. Replication Technologies, knowledge of SAN/CAS, Database performance tuning etc. Troubleshooting memory related errors with Oracle 12c/19.x and Patching with RAC and Non RAC
Other areas	Understanding Shell scripting, PL/SQL, software networking, SSL/TLS certificate deployment

<u>**General Awareness, English, Reasoning ≈ 30%**</u>

Domain Knowledge ≈ 70%

Item	Description
Oracle EBS Suite Technical Knowledge	Knowledge of Oracle EBS Apps suite Technical role. Knowledge of Oracle Apps EBS Apps Functional role (Payroll/Finance/HRMS).
Other areas	Basic knowledge of Primavera Unifier, Identity Governance, Oracle Access Manager/Identity Governance.
	Knowledge of PL/SQL for data extraction. Basic knowledge of Oracle EBS form designing, report creation. Basic Web/Mobile Application development/ Maintenance in any of the programming language (like Java, Javascript, Python).

General Awareness, English, Reasoning ≈ 30%