

SYLLABUS FOR PROMOTION TO GROUP 'B' POST OF ADME/AWM THROUGH 30% LDCE IN MECHANICAL DEPARTMENT

Paper will be of two parts one part will be of General questions comprising questions from General Knowledge, Quantitative aptitude, Applied Mechanics, General Science Information Technology and EnHM. and other sections comprising of questions from establishment, financial rules and Stores will be and Technical questions from four streams of Mechanical Department. Questions on PU are included in workshop segment. Question on Rajbhasha will be of optional nature of fifteen marks

Section A

GENERAL PORTION-

GENERAL KNOWLEDGE

This section would contain questions of general interest and importance which is acquired by general observation and reading without specific text book study. Subjects of national importance as well as achievements of railways will also be covered. The standard of General Knowledge shall not be more rigorous than Matriculation.

Quantitative Aptitude

- Arithmetic & Statistical Operations Graphs, Fractions, Percentage, Sampling & Averages
- Geometry-Area & volume upon Higher Secondary/Class 12 Standard
- Algebra, simultaneous equations etc upon Higher Secondary/Class 12 Standard
- Questions on General quantitative aptitude

Applied Mechanics

Various Engineering materials and their properties, Bearings, Stress & Strain, Fatigue, Hardness, Corrosion & Surface finish.

General Science

- Mechanics: Newton's Laws of Motion, Velocity & Acceleration, work, energy, power, Archimedes Principle etc.
- Temperature & its measurement
- Mechanics Velocity & Acceleration, work done & horse power etc upon Higher Secondary/Class 12 standard
- Heat & Work, Expansion of Solids Liquids & Gases
- IC Engines, Gas Turbines, Heat Recovery & Thermal Efficiency, Supercharging & Intercooling
- Ohm's Law, Coulombs Law, Faraday's Laws, Voltage, Current & Resistance, wet & dry batteries, power factor
- Simple Motors & Dynamos-Principle & working, transformer, relay, fuse, circuit breakers
- Power Supply, AC & DC, Rectification

INFORMATION TECHNOLOGY

Familiarity with Personal Computer Specs- Processor, RAM, Hard Disk, Floppy, CD, Multimedia etc.

- Basic MS Word, Excel and Power Point

- Basic Local Area Networks: Servers, Hubs, Switches, Structured Cabling, Nodes, Network applications
- Using Internet: Email, Browsing, Searching
- General Information on various portals used in Indian Railways including GEM,UDM,IREPS,FMM,E Office etc.

EnHM

- Environment, Quality Management Systems ISO 9000 & ISO 14000
- Environment management system (ISO 14001),
- solid waste management rules
- CTE (Consent to Establish) CTO, (Consent to operate)
- Water act, air act,
- hazardous waste management act
- water policy of Indian Railways

Section B

Part-A consists of questions from Establishment ,Financial rules & Stores.

Part-B Contains Professional portion in Four sections representing various streams of Mechanical Branch – Division & Workshop Management, Diesel Locomotives, Carriage & Wagon and Workshops,

PART-A (Stores Rules)

STORES

- Classification of Stores
- Procedure of drawal of Stores
- Indenting Procedures
- Procurement methods-Local purchase, Spot purchase, Bulletin tender, Advertised tender, Limited tender, Tender Committee, Direct Purchasing
- Schedule of Powers
- Incoming inspection requirements
- Scrap disposal

PART-B-Professional Portion-

DIVISIONAL WORKING & OPERATIONS MANAGEMENT

- Working Time Table
- Working in Control Office including Passanger grievance redressal portals e.g. Rail Madad
- Accident Classification, definitions, ART Ordering, Role of Supervisors & officers at accident site Management. ,Accident investigation including proforma for measurement
- 140 ton Crane Construction & safety in operations

DIESEL LOCOMOTIVES

- Basic Features and troubleshooting of HHP locomotives
- Preventive maintenance schedules
- Latest design improvements in diesel locomotives to reduce failures on line.
- Features of GE Locomotives
- Design improvements in bogies to make them fit for high speed operation
- Air Brake system of diesel locos including working of compressors and vigilance control devices and their maintenance
- Cooling water system of diesel engines
- Fuel oil system of diesel engines
- Control of lubricating oil consumption
- Safety devices used on diesel engines and locomotives
- Trouble shooting on locomotives running on the railways
- Fuel Economy on diesel locomotives
- Thermal loading of engine components
- Under gear maintenance
- Suspension bearings, wheels
- Electric Systems of Diesel Locomotive
- Load Box Testing
- MEMU ,DEMUs-types, systems & trouble shooting
- Basics of DPRS (Distributed Power Rolling Stock)
- Introduction to GM Locomotives and its systems

CARRIAGE & WAGON

Coaching stock- preventive maintenance schedules in Coaching Depots including IOH.POH, SS2, SS3 Schedules in shops

- Wagon Stock-preventive maintenance including ROH in depots and POH Schedule in shops ,Ride Index, Anti Telescopic features
- IRCA Rules for reject able defects
- ICF & LHB Coach Bodies and their maintenance in sick line/shops
- Generic details of train set
- Casnub Bogie & its modifications for high speed
- Corrosion repairs to caching and goods stock
- Couplers & Draw gear, Train Parting , Brake Binding & measures to avoid the same
- Water availability in coaches
- Fire prevention on Trains
- Air Brake System-Twin Pipe & single pine. Under frame & bogie mounted brake system, Test rig, Checking timings, trouble shooting, DV defects, slack adjustment methods. Brake Binding, WSP system, FIBA, Air spring suspension in LHB coaches
- Passenger amenity items
- OBHS , CTS and other coach cleaning systems

- Maintenance Pattern of freight trains including CC Rakes & Coaching stock maintenance including Revised Policy Circular-4
- Neutral Train Examination
- Maintenance of various components like DV, SAB, PEASD
- Latest design improvements of Carriage & Wagons to improve their performance and speed potential
- LHB Coaches & BLC Wagons
- Construction, Design & Maintenance of special purpose Wagons

WORKSHOPS and Production Units

- System of labour accountal GA Cards for time keeping documents, tally sheets, Job/Route Cards, inspection & rate fixing
- Rules & Calculations under incentive scheme
- Paints & painting systems
- Different types of machine tools such as lathes, milling machines, shapers, planers, cutting tools & cutting speeds
- CNC machines
- CLW Pattern of Incentive Scheme, Group Incentive Scheme
- Different types of welding processes, welding defects
- Wheels, tyres & axles and their ultrasonic testing
- Heat treatment of ferrous items such as surface hardening, annealing, normalizing etc
- Roller Bearing & Cartridge Bearings
- Injury free features in coaches
- Material handling
- Design of coaches and wagons
- Basic concepts of casting and Heat treatment methods
- Manufacturing and Heat treatment process of wheels and axles
- Factory Layout
- Process flow chart of Production Units
- Machinery and Plant maintenance

Rajbhasha

Optional questions of 15 marks