

SYLLABUS FOR 30% LDCE FOR PROMOTION TO GROUP “B” FOR AME/AWM IN MECHANICAL DEPARTMENT		
MAXIMUM MARKS 150	PAPER-I	PASS MARKS – 90
Part A – GENERAL PORTION – 50 MARKS		
GENERAL KNOWLEDGE		
<p>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.</p>		
Official Language		
GENERAL MATHEMATICS		
<ul style="list-style-type: none"> • Arithmetic & Statistical operations Graphs, Fractions, Percentage, Sampling & Averages. • Geometry-Area & volume up to Higher Secondary/Class 12 Standard • Algebra, simultaneous equations etc up to Higher Secondary/Class 12 Standard • Mechanics Velocity & Acceleration, work done & horse power etc up to Higher Secondary/Class 12 Standard 		
STRENGTH OF MATERIAL		
<p>Various Engineering materials and their properties, Bearings, Stress & Strain, Fatigue, hardness, Corrosion & Surface finish.</p>		
PHYSICS & BASIC ELECTRICITY		
<ul style="list-style-type: none"> • Temperature & its measurement • Mechanics: Newton’s Laws of Motion, Velocity & Acceleration, work, energy, power, Archimedes Principle etc. • 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 		
PART-B PROFESSIONAL PORTION - 100 MARKS		
GENERAL		
<ul style="list-style-type: none"> • Out of commission (under repair) percentage for different types of rolling stock & motive power and how to minimize the same • Different Types of Locomotive, Coaches & wagon Stock in use on the Railways. • Prevention of hot boxes on motive power/rolling stock & maintenance of roller bearings • Disaster Management – Accident Classification, duties of first official to reach at accident site, causes of accidents and their prevention, existing disaster management system & its shortcomings, recommendations of high level committee, accident Enquiry • Corporate Safety Plan, RSRC Recommendations • Benchmarking • Quality Improvement in Work area • Failure analysis • Performance Indices • Items to be inspected at workplace • Health & Safety Standards in Shops, Sheds & Depots 		

STORES

- Classification of Stores
- Procedure for 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

INFORMATION TECHNOLOGY

- Familiarity with Personal Computer, Specs- Processor, RAM, Hard Disk, Floppy, CD, Multimedia etc.
- Operating System – Windows
 - Starting & Closing programs
 - Creating/Saving/Copying/Moving files in PC and moving files from one PC to another PC
 - Utilities/Accessories: Disk Cleanup, Defrag, Antivirus, CD Burning
- Basic MS Word, Excel and PowerPoint
- Basic Local Area Networks: Servers, Hubs, Switches, Structured Cabling, Nodes, Network applications
- Using internet: Email, Browsing, Searching

OTHER ISSUES

Environment, Quality Management Systems ISO 9000 & ISO 14000

SYLLABUS FOR PAPER-II

MAXIMUM MARKS 150

PASS MARKS 90

Sufficient number of questions shall be included in each of the disciplines to enable a candidate to answer the questions up to full 150 marks.

Part-A consists of Establishment & Financial rules worth 50 marks.

Part-B contains Professional portion of 100 marks in Four sections representing various streams of Mechanical Branch – Division & Workshop Management, Diesel Locomotives, Carriage & Wagon and Workshops. Candidates can attempt questions from their own discipline or from more than one discipline if he so desires to complete up to 100 marks.

PART – A (Establishment & Financial Rules) – 50 MARKS

ESTABLISHMENT RULES

- General Conditions of service of Railway servants including rules regarding leave, joining time, passes
- Railway Service D&A Rules – 1968
- Railway Service Conduct Rules – 1966
- Retirement Benefits
- Payment of Wages, Allowances and Overtime
- Labour laws including Payment of Wages Act, Workmen’s Compensation Act, Hours of Employment Regulations, Factories Act, Industrial Disputes Act, Contract Labour Act
- Manpower Planning & Training
- Welfare measures in Railways
- PNM, JCM & PREM

FINANCIAL RULES

- Parliamentary Control over Railway Finance – Public accountability, Cannons of Financial Propriety
- Railway Budget – Budgetary terms, types of Budgets, Budget Cycle, Demand for grants, Expenditure Classification
- Works Programme – Financial Justification of Works – Preparation of Estimates, Capital budget, Control Over Capital Expenditure
- Financial and Cost Control in Railway Workshops, Sheds & Depot
- Delegation of Powers
- M&P Programme, RSP

PART- B – Professional Portion – 100 Marks

DIVISIONAL WORKING & OPERATIONS MANAGEMENT

- Working Time Table
- Working in Control Office
- Power Plan & Engine Utilization
- HOER & Crew Planning
- Running rooms & crew booking point management
- Fuelling Installations Management
- Running staff training
- Load Trials
- Drivers Grading System
- Accident Classification, definitions, ART Ordering, Role of Supervisors & Officers at accident site management.
- 140 ton Crane Construction & safety in operations

DIESEL LOCOMOTIVES

- Preventive maintenance schedules
- Latest design improvements in diesel locomotives to reduce failures on line
- Design improvements in bogies to make them fit for high speed operation
- Brake system of diesel locos including working of expressors 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
- Testing Equipment required in sheds for governors and fuel injection pumps. Non destructive testing such Zyglo & magnaflux
- Trouble shooting on locomotives running on the railways
- Fuel Economy on diesel locomotives
- Maintenance requirements of different assemblies like – Traction motor/ Traction Generator, expressor, Turbo supercharger, power assembly, cylinder head
- Thermal loading of engine components
- Under gear maintenance
- Suspension bearing, wheels
- Excitation system, transition, dynamic braking, carbon brushes, relays & contactors
- Load Box Testing
- Improvements made in ALCO locomotives
- DEMUs- types, systems & trouble shooting
- Biodiesel, CNG
- Introduction to GM Locomotives and its systems

CARRIAGE & WAGON

- Coaching stock – preventive maintenance schedules in Coaching Depots including IOH,POH schedules in shops
- Wagon Stock-preventive maintenance including ROH in depots and POH Schedule in shops
- IRCA Rules for rejectable defects
- ICF Bogies and their maintenance in sick line / shops
- Casnub Bogie & its modifications for high speed
- Corrosion repairs to coaching and goods stock
- Couplers & Draw gear, Train Parting & measures to avoid the same
- Water availability in coaches
- Fire prevention on Trains
- Air Brake System-Twin Pipe & single pipe. Under frame & bogie mounted brake system, Test rig, Checking timings, trouble shooting, DV defects, slack adjustments methods. Brake Binding
- Passenger amenity items
- Coach Housekeeping
- Maintenance Pattern of freight trains including CC Rakes & Coaching stock maintenance including Revised policy Circular – 4
- Neutral train Examination
- Ride Index
- Anti Telescopic features
- 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 Tank Wagons

WORKSHOPS

- 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
