

வேகம் - RRB JUNIOR ENGINEER MECHANICAL 2025

Mechanical - Recording Classes	
Machining	
Lathe – Principle, Types, Construction, Specifications	
Cutting Tool – Geometry, Nomenclature, Signature, Tool Angle	
Special Operations – Taper Turning, Thread Cutting, Knurling, Forming, Drilling, Boring, Reaming, Keyway Cutting	
Cutting Fluids – Coolants, Lubricants, Shaper, Slotter, Planner	
Welding	
Introduction, Principles, Types, Equipment, Advantages, Limitations	
Gas Welding – Principle, Types, Equipment, Soldering – Types, Solders, Brazing	
Flame Cutting – Principle, Process, Equipment, Advantages, Limitations	
Welding Defects, Inspection Types, MIG & TIG Welding	
Grinding & Finishing Processes	
Metal Removal – Principle, Types, Applications, Abrasives (Natural & Artificial)	
Grinding Machines – Cylindrical, Surface, Tool & Cutter, Centreless, Wheel Types, Maintenance, Balancing	
Honing, Lapping, Finishing, Electroplating – Principles, Applications	
Hot Dipping, Galvanising, Parkerising, Anodising, Metal Spraying – Wire & Powder Processes, Applications	
Metrology	
Linear and Angular Measurement – Types	
Comparators – Mechanical, Electrical, Optical, Pneumatic	
Surface Roughness – Methods, Interferometer, Collimator, Measuring Microscope	
Inspection, Shadow Projection Principle, Profile Projector – Principle, Advantages, Applications	
Industrial Management	
Job Analysis, Motivation, Theories, Performance & Reward Systems	
Production Planning and Control – Routing, Scheduling, Dispatching, PERT and CPM	
Materials in Industry, Inventory Control, ABC Analysis, EOQ, Break-Even Analysis	
Stores Layout, Equipment – Bin Card, Cardex, Material Handling – Hoist, Cranes, Conveyors, Trucks, Fork Trucks	

Fluid Mechanics & Hydraulic Machinery

Fluid Properties – Density, Specific Weight, Specific Gravity, Viscosity, Surface Tension, Compressibility, Capillarity

Pascal's Law, Buoyancy, Reynold's Number, Pressure, Energy Concepts

Laws of Conservation – Mass, Energy, Momentum, Velocity of Liquids, Discharge

Bernoulli's Equation – Assumptions, Venturi Meters, Pitot-Tube, Current Meters

Pumps – Centrifugal, Jet, Submersible, Efficiencies – Manometric, Volumetric, Mechanical, Overall

Thermal Engineering

Laws of Thermodynamics, Heat-Work Conversion, Perfect Gases – Laws

Thermodynamic Processes – Isochoric, Isobaric, Isothermal, Hyperbolic, Isentropic, Polytropic, Throttling

Heat Transfer – Modes, Thermal Conductivity, Convective Heat Transfer Coefficient

Stefan-Boltzmann Law, Overall Heat Transfer Coefficient, Air Standard Cycles – Carnot, Otto, Diesel

Internal Combustion Engines – Diesel vs Petrol, Refrigeration Plant

Engineering Mechanics

Resolution of forces, Equilibrium and Equilibrant, parallelogram law of forces, triangle law of forces

Polygon law of forces, Lami's theorem, couple, moment of a couple, condition for equilibrium of rigid body

Definition of static friction, dynamic friction, derivation of limiting angle of friction and angle of repose

Calc of moment of inertia and radius of gyration of: I-Section, channel section, T, L, Z-Section, Built up sections

Static and Dynamic Friction – Definitions, Limiting Angle, Angle of Repose

laws of motion, motion of projectile, D'Alembert's principle, definition law of conservation of energy, momentum

Strength of Materials

Stress, strain, stress strain diagram, factor of safety, thermal stresses, strain energy

proof resilience and modules of resilience, Shear force and bending moment diagram

cantilever beam, simply supported beam, continuous beam, fixed beam

Torsion in shafts and springs, thin cylinder shells

Material Science

Mechanical properties of engineering materials – tensile strength, compressive strength, ductility, malleability

Hardness, Toughness, Brittleness, Impact Strength, Fatigue, Creep Resistance

Classification of Steels – Mild & Alloy Steels, Importance of Heat Treatment

Heat Treatment Processes – Annealing, Normalizing, Hardening, Tempering, Carburizing, Nitriding, Cyaniding

Previous Year Questions (PYQ) Discussion

PYQ – 1

PYQ – 2

PYQ – 3

PYQ – 4

PYQ – 5

PYQ – 6

PYQ – 7

