Syllabus for Recruitment Test for the post of Works Manager and Store Purchase Officer in Transport Department, Haryana

MECHANICAL ENGINEERING

1. THERMODYNAMICS


2. HEAT TRANSFER


3. THERMAL AND POWER PLANT ENGINEERING

Introduction to S.I. and C.I. Engines, performance parameters, Gas turbine-open and closed cycle, Steam Nozzle, Steam turbine, velocity diagram. Layout and working principles of thermal, hydraulic, gas and nuclear power plants. Wind power Plants, Solar power plants and other unconventional sources of power. Power plant economics.

4. REFRIGERATION AND AIR CONDITIONING


5. AUTOMOBILE ENGINEERING

Transmission System: Clutch, Gear-box, Propeller Shaft, Differential, Brakes, Braking system, Steering system, Air pollution by Automobile Engines and its controls, Suspension system, Aerodynamic design of vehicle body, various safety features, Fuel System.

6. FLUID MECHANICS AND MACHINERY

Basic definitions and fluid properties, Continuity equation, Bernoulli’s equation, Flow through pipes, Laminar and Turbulent flow, Vortex motion, Application of momentum equation, Boundary layer and its control, Measurement of flow by Venturimeter, Orifice meter and Pilot tube, Dimensional analysis. Pelton, Francis and Kaplan turbine, their construction, performance and characteristics, Axial, Centrifugal and Reciprocating Compressors and pumps, Cavitation in pumps, Selection of Pumps and Turbines.
7. STRENGTH OF MATERIALS


8. THEORY OF MACHINE

Kinematics, Quadratic chain and slider-crank mechanisms and their inversions, Power transmission-belt rope and chain, Gear Drives, Primary and Secondary Balancing, Free and Forced Vibration, Flywheel, Cams, Brakes and dynamos, Governors, Gyroscope, Various types of bearings.

9. MACHINE DESIGN

Design of machine elements subjected to direct stress. Design of members subjected to bending, torsion like beam, coil and laminated spring. Design of shaft, coupling, gear, thick and thin cylinder.

10. PRODUCTION ENGINEERING


11. INDUSTRIAL ENGINEERING AND OPERATION RESEARCH

Principles of management, Plant layout, Production planning and control, Work-Study, Inventory control ABC analysis, EOQ model. Linear programming: Simplex methods, Assignment and Transportation model, Single server queuing model, Concept of CPM and PERT, Statistical quality control and charts, Forecasting, Scheduling, Break-Even analysis.