RAJASTHAN PUBLIC SERVICE COMMISSON, AJMER

Syllabus for Screening Test for the post of Assistant Drilling Engineer,
Mines & Geology Department.

1. THERMODYNAMICS:

Heat, work and temperature, First and Second and Zeroth law of thermodynamics and their applications, Carnot, Otto, Diesel and Dual cycles, S.I. and C.I. Engines, performance parameters, Properties of steam, Vapour power cycles like Rankine, Modified-Rankine, Reheat and Regenerative cycles, Steam Nozzle, Steam turbine and Gas Turbine.

2. HEAT TRANSFER:

Steady state one dimensional heat conduction, convection and radiation, Introduction to thermal boundary layer, Heat exchanger, Boiling and condensation, Boilers, its mountings and accessories.

3. 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.

4. FLUID MECHANICS AND MACHINES:

Basic definitions and fluid properties, Continuity equation, Bernoulli’s theorem, Flow through pipes, Laminar and Turbulent flow, Application of momentum equation, Measurement of flow by Venturimeter, V-notch and Pitot tube, Dimensional analysis.

Pelton, Francis and Kaplan turbine, their construction, performance and characteristics, Axial, Centrifugal and Reciprocating compressors and pumps, Cavitation in pumps.

5. MECHANICS OF SOLIDS:

Simple stress and strain, Hooke’s law, Bending moment and Shear force diagram, Bending and shearing stresses, Column and Struts, Torque and Torsion, machine members subjected to combined loading, Deflection of beams, Theories of failure, Principal stresses and planes.

6. MATERIAL TECHNOLOGY:


7. THEORY OF MACHINE:

8. **MACHINE DESIGN:**
Design of machine elements subjected to direct stress, Design of members subjected to bending, torsion like beam, spring, laminated spring. Design of Curved Beams. Design of shaft, Coupling, Gear, thick and thin cylinder.

9. **PRODUCTION ENGINEERING:**

10. **INSTRUMENTATION AND CONTROL SYSTEMS:**

11. **INDUSTRIAL ENGINEERING:**

12. **OPERATION RESEARCH AND PRODUCTION MANAGEMENT:**
Linear programming, Assignment, Transportation, Game Theory, Statistical quality control, Inventory control, Forecasting, Aggregate planning, MRP, MRP-II, Scheduling. Break - Even analysis, make v/s buy decision.

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**Note :- Pattern of question Paper**

1. Objective type paper.
2. Maximum Marks : 100
3. Number of Questions : 100
4. Duration of Paper : Two Hours
5. There will be Negative Marking
6. All Questions carry equal marks.

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