

# ASSAM PUBLIC SERVICE COMMISSION

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## **ASSISTANT ENGINEER (MECHANICAL)**

### **SYLLABUS** **(Degree Standard)**

Syllabus for Screening Test for Recruitment to the post of *Assistant Engineer (Mechanical)* under Irrigation Department of Govt. of Assam. The Educational Qualification is Degree Standard.

#### **General Studies:**

**Full Marks** : 100 Marks

Multiple Choice Objective Type Questions.

**Time** : 2:00 hours

- (i) Current Events of National & International Importance.
- (ii) History of India & History of Assam.
- (iii) Physical & Political Geography.
- (iv) Indian Economy, Indian National Movement.
- (v) Mental Ability
- (vi) Role and Impact of Science and Technology in India.
- (vii) Indian Polity, Political System in India.
- (viii) Indian Culture & Literature.

#### **Mechanical Engineering:**

**Full Marks** : 100 Marks

Multiple Choice Objective Type Questions.

**Time** : 2:00 hours

- Statics** : Simple application of equilibrium equations.
- Dynamics** : Simple applications of equations of motion, simple harmonic motion, work energy, power
- Theory of Machines** : Simple examples of links and mechanism, Classification of gears, standard gear tooth profiles wheel types of governors, static(s) and dynamic balancing, Simple examples of vibration of bars, Whirling of shafts.
- Mechanics of Solids** : Stress strain, Hook's Law, elastic moduli, bending moments and shearing force diagrams for beams, Simple bending and torsion of beams, Spring, Thinwalled cylinders, Mechanical properties and material testing.

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- Manufacturing Science** : Mechanics of metal cutting tool life economics of machining cutting, tool materials. Basic machining processes, types of machine tools, transfer lines, Shearing drawing spinning, rolling forging extrusion, Different types of casting and welding methods.
- Production Management(s)** : Method and time study, motion, economy and work space design, operation and flow process charts, Product design and const selection of manufacturing process, Break even analysis, Site Selection of equipment for job, Shop and Mass production, Duling dispatching, Routing.
- Thermodynamics** : Heat, work and temperature, First and Second Laws of thermodynamics, Carnot Rankine, Otto and Diesel- Cycles.
- Fluid Mechanics** : Hydrostatics, Continuity equation, Bernoulli's theorem, Flow through pipes, Discharge measurement, Laminar and Turbulent flow, Concept of boundary layer.
- Heat Transfer** : One dimensional steady, state conduction through walls and cylinders, Fins, Concepts of thermal boundary layer, Heat transfer coefficient, Combined heat transfer, Coefficient, Heat ex-exchangers.
- Energy Conversion** : Compression and spark ignition engines, Compressors, Fans and Blowers, Hydraulic pumps and turbines, Thermal turbo machines, Boilers, Flow of steam through nozzles, Layout of power plants.
- Environmental Control** : Refrigeration cycles, refrigeration equipment, its operation and maintenance, Important refrigerants, Psychometrics comfort, Cooling and dehumidification.

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