

SYLLABUS FOR WRITTEN TEST

POST NAME: TECHNICAL ASSISTANT (MECHANICAL)

Qualification: 3 Year Diploma in Mechanical Engineering

TECHNICAL MATHEMATICS:

Matrices, Determinants, Trigonometric functions, Properties of trigonometric functions, Properties of triangles, Solution of triangles, Functions, Limits & Continuity, Differentiation, Integration.

APPLIED MECHANICS & STRENGTH OF MATERIALS:

Units & Dimensions, Dynamics, Circular motion, Forces, Rotational dynamics, Simple stress & strain, Shear stress & strain, Thermal stress & strain, Friction, Properties of sections, Torsion of shafts & springs, Theory of simple bending and deflection of beams.

ENGINEERING MATERIALS:

Mechanical properties of materials and alloys, Material science, Manufacturing of metals & alloys, Heat treatment process, Iron carbon equilibrium diagram, Powder metallurgy. Properties, testing and inspection of materials.

MANUFACTURING PROCESS:

Machining process & tools, Smithy & forging, Welding, Soldering & brazing, Carpentry, Foundry, Bench work, Fitting, Welding processes, Metrology.

THERMAL ENGINEERING:

Basics of thermodynamics, Thermodynamic processes of perfect gases, Thermodynamic air cycles, Steady flow energy equation and applications, Air compressors, Fuels, Combustion of fuels. I.C engines, Performance of I.C engines, Steam boilers, Nozzles and turbines, Heat transfer.

FLUID MECHANICS AND HYDRAULIC MACHINERIES:

Properties of fluids, Fluid pressure and its measurement, Kinematics and dynamics of fluid flow, Flow through orifices, notches, pipe, & nozzles. Fluid power: Hydraulic system, Pumps, Turbines.

REFRIGERATION AND AIR CONDITIONING:

Principle of Refrigeration, Air Refrigeration System, Vapour compression refrigeration cycle. Refrigeration equipments, Refrigerants, Application of refrigeration, Air conditioning, Low temperature refrigeration. Principle of psychrometry.

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POWER PLANT ENGINEERING:

Steam Generators, Properties of steam, Thermodynamic vapour cycle, Steam engine, Steam turbines, Steam condensers, Gas turbine, Diesel power plant, Nuclear power engineering, Renewable sources engineering.

COMPUTER INTEGRATED MANUFACTURING:

Computer Aided Design and geometric modelling, Computer aided manufacturing methods. Computer Aided Process Planning (CAPP), CNC and DNC, Basic elements of automation, Basics of robotics, Flexible Manufacturing system.

ADVANCED PRODUCTION PROCESS:

Basic concepts of NC and CNC, Programming CNC machines, Machining Centres & Turning Centres, Broaching machines, Gear manufacture, Press tool, Processing of plastics, Jigs & Fixtures, Jig boring, Grinding, Surface finishing methods, Non-conventional machining, Powder metallurgy, Additive manufacturing.

INDUSTRIAL ENGINEERING & MANAGEMENT:

Organisation structure, Production planning and control, Inspection & Quality control. Control charts, Estimating and costing, Value Engineering, Material handling, Plant maintenance.

DESIGN OF MACHINE ELEMENTS:

Basic requirement in design of bolts, nuts, screws, shafts, keys, couplings, belts, chains and gears, Fly wheel and governors, Cams, Riveted joints, Welded joints.

MACHINE DRAWINGS:

Fundamentals of Engineering drawings, Dimensioning, Tolerances, Standard symbols used in drawings, Fits, Process sheets, etc.
