

TAMIL NADU PUBLIC SERVICE COMMISSION
SYLLABUS

TRADE - FITTER (ITI Standard)

Code: 436

UNIT- I : SAFETY AND ITS IMPORTANT : Safety and General Precautions in Industry/Shop floor - Personal Productive Equipments (PPE) - First Aid – Operations of Electrical Mains - Disposal of Waste Materials- Occupational Safety and Health – Safety Signs – Response to Emergencies – Importance of House Keeping – Material Handling - Lifting and Handling Loads – Moving Heavy Equipments.

UNIT – II : BASIC FITTING: Linear Measurement – Base unit of linear measurement, System of units of measurement, Multiples of a Metre and their values.

Steel Rule - Purpose of steel rule, Types, precautions to be followed while using steel rule.

Marking Instruments – Feature , uses and type of Scriber , Caliper, Punches, Hammer , “V” Block , Try Square - Bevel Gauge , Bevel Protractor, Combination Set, Surface Gauge , Surface Plate , Angle Plate.

Cutting Tools – Hack Saw Frames, Hacksaw Blades, Files and Special files types and specification, Cold chisel and types, Power Saws, Drilling Machines, Drilling Operations, Drills, Taps, Dies, Tap drill size and Blank Size calculation.

Grinding – Grinding Machines, Grinding Wheel Specification, Loading, Glazing, Dressing and Truing.

Work holding Devices – Bench Vice, Machine Vice, Clamps and Strap.

Tool Holding Devices – Drill Chuck & Key, Tapper Sleeve & Sockets, Tap Wrench, Die Stock.

Precision Measuring Instruments – construction, Least Count, Graduation and types of Vernier Caliper, Micro Metre, Vernier Micrometer, Screw thread Micrometer, Vernier Bevel Protractor, Dial Caliper, Dial test indicator and comparator.

UNIT III : SHEET METAL WORK: Safety in sheet metal work shop - Metal sheets and their uses – Hand lever shear – Sheet metal Tools, Different shear operation - Rivet & Riveting - Solder & Soldering

UNIT – IV : WELDING: Safety in welding shop - Welding Hand Tools – Gas Welding Equipments and Process – Setting of Parameter for Arc welding Machines – Oxy – Acetylene cutting Equipments. – Arc welding defects and Testing – Types of Joints – Selection and Storage of Electrodes.

UNIT – V : LIMIT , FIT , TOLERANCE AND INTERCHANGEABILITY : Necessity of Interchangeability – Standard System of Limit and Fits Terminology – Fits and Classification as per Indian Standard – BIS system of Limits and Fits reading the standard chart – Hole and Shaft basis system of Limit and Fit.

UNIT – VI : TURNING : Safety while working on Lathes – Lathe Main Parts – Feed & Thread cutting Mechanism – Methods of Holding Jobs – Different Lathe Operations – Lathe Tool and its Nomenclature – Tool Selection – Lathe cutting speed and Feed – Use of Cutting fluid (Coolant) and Properties.

UNIT – VII : BASIC MAINTENANCE , ERECTION AND TESTING OF MACHINERIES: Total Productive Maintenance – Routine Maintenance – Break down Maintenance & Preventive Maintenance – Installation of Machinery – Foundation bolts and types – Sling Load for Shifting – Erection Tools and Techniques – Fork Lift and Pallet Truck - Lubricant and its Properties – Types of Lubrication - Different Methods of Lubrication.

Repair Technique – Power Transmission Elements and its types, application and Uses (Gear, Belt and Pulley, Coupling, Chain and Sprocket, Clutches, Bearing and bearing metals – Velocity Ratio calculation in Gear and Belt and chain drive.

UNIT - VIII : METALS: Metal & Non Metal - Ferrous Metal Manufacturing process and properties (Pig Iron , Cast Iron , Wrought Iron and Steel) – Non - Ferrous Metal properties and uses (Aluminium , Lead , Tin Copper , Zinc and their Alloys) – Heat Treatment – Structure of steels – Annealing – Normalizing - Hardening – Tempering – Different methods of Surface hardening - Prevention of Rust and Corrosion -Galvanizing , Electro Plating , Cladding , Metal Spraying and Cementation.

UNIT - IX ASSEMBLING:

Locking Devices – Screws, Bolt and Nuts, Keys, Cotter, Split Pin, Screw Driver, Spanners, Power Tools.

Gauges and Template – Radius gauge , Screw Pitch gauge , Drill Gauge , Centre gauge , Feeler gauge , Wire gauge , Telescopic gauge.

Limit Gauges – Principle of 'Go' and 'No-GO' - Plug gauge, Snap gauge, Ring gauge, Taper gauge.

Sine bar and Slip gauge – Principle, uses, application and Taper calculation.
Finishing Process – Lapping, Honing, Frosting and Scrapping – Application and Methods.

Jig and Fixtures – Construction, Types and its accessories – Advantages and Disadvantages.

Inspection – Visual inspection, Quality Standard, Quality control inspection.

UNIT – X HYDRAULICS AND PNEUMATICS:

Hydraulics – Safety precautions – Symbols – Filters – Pumps – Cylinders – Flow control Valves – Tube and pipe assembly – application and common maintenance of hydraulic.

Pneumatics – Safety Precautions – Symbols – FRL Unit – Actuator – Cylinder – Types of pneumatic valve – Air compressor parts and function – Electro pneumatic system - application and common maintenance of pneumatic.

Pipe and Pipe fittings – Pipe fitting Tools, Symbols , Standard pipe fitting accessories , Pipe thread , Pipe die and Tap , Repair and maintenance of Water Tap.