

**FURTHER DETAILS REGARDING MAIN TOPICS OF  
PROGRAMME NO. 10/2017 (Item No.1 )**

**TECHNICIAN GRADE II  
(GENERAL MECHANIC)**

**(CATEGORY NO. 195/16)**

**MODULE – I**

**Safety** - Importance of safety, general safety, personal safety, machine safety precautions. Personal protective equipments and its applications.

**First Aid** - Importance of first aid, basic first aid, ABC of first aid, aim of first aid, methods of giving first aid to the victim.

**Fire** – Fire triangle, class of fire, fire extinguisher, type of fire extinguisher, fire extinguisher recommended for each class of fire.

**Handling of waste material** – Waste material, list of waste material, methods of waste disposal.

**Shop floor maintenance** – Benefits of shop floor maintenance, introduction to 5 S concept, its applications and benefits.

**Road Safety** – Kinds of road signs, marking lines on road, police signals, traffic light signals, collision causes.

**Computer and internet** – Computer, parts, basic applications, and basic terms related to computer and internet.

**MODULE – II**

**Units** – Units of linear and angular measurements, SI, CGS, MKS, FPS units, fundamental units and supplementary units, Unit conversions.

**Linear measuring tools** – outside calliper, inside calliper, steel rule, depth gauge, vernier calliper, vernier height gauge, micrometers – constructional features, working principle, least count, applications, care and maintenance.

**Angular measuring tools** – bevel gauge, universal bevel gauge, bevel protractor, combination set, vernier bevel protractor – constructional features, working principle, least count, applications, care and maintenance.

Sine bar, slip gauge and dial test indicator – constructional features, working principle, applications, care and maintenance.

### MODULE – III

**Hand tools** – File, hack saw & blade, chisel, punch, hammer, jenny calliper, divider, tap & tap wrench, die & die stock, drill bit, reamer, scriber – type, use, constructional features, specifications, care and maintenance.

**Gauges** – Feeler gauge, SWG, screw pitch gauge, snap gauges, limit gauges, radius gauge, telescopic gauge, small hole gauge – use, constructional features, care and maintenance.

**Marking media** – White wash, Prussian blue, copper sulphate, cellulose lacquer – type, applications, preparation, advantages & disadvantages.

**Holding and Supporting devices** – Bench vice, machine vice, pipe vice, hand vice, pin vice, tool makers vice, V-block, parallel block, surface plate, angle plate, marking off table – type, use, constructional features, specifications, care and maintenance.

### MODULE – IV

**Engineering materials** – metals & non metals

**Metals** – ferrous metals – pig iron, wrought iron, cast iron, plain carbon steel – ore, manufacturing process, properties, uses, melting points.

Non ferrous metals – copper, aluminium, tin, lead, zinc – ore, manufacturing process, properties, uses, melting points.

**Furnaces** – cupola furnace, blast furnace – other making process of metals.

**Heat treatment process** – hardening, tempering, annealing, normalizing, case hardening – process, applications, important temperatures points.

## MODULE – V

**Grinding** – Bench grinder, pedestal grinding machine – constructional features.

**Grinding Wheel** – specification, types of bond, structure, grade, abrasive material, uses, and mounding, truing, dressing, types of wheel dresser.

**Power hack saw** – constructional features, specification, applications.

**Lathe** – Type, constructional features, specification, applications, operations.

**Drilling Machine** – Type, constructional features, specification, applications and operations. Drilling defects, causes, remedies

**Drill kinds** – fraction, metric, letter and number.

Calculations for – tap drill size and determining hole size for reaming.

## MODULE – VI

Importance of safety and general precautions observed in welding shop

**Welding** – principle of welding, types of welding – forge welding, arc welding, gas welding, method of operation, tools and equipments used for welding – arc welding equipments, gas welding plant, gases used in gas welding, types of flames, types of joints in welding.

**Sheet Metal** – sheet size, types of metal sheet, coated sheets and their specifications, Joints in sheet metal work.

**Tools in sheet metal work** – Wing compass, snips, punches, tin makers square, dolly, snaps, mallet, stakes, trammels, hand groover – specification, uses, constructional features

**Soldering** – Soldering iron – type, specification, uses

**Solder** – soft solder, hard solder, composition of various type of solder and their heating media of soldering iron, flux type, selection and applications

**Rivets** – Type, size and selection for various works, method of riveting

**Machines** – Shearing machine and bending machine – Description, parts and applications

## MODULE – VII

**Power Transmission** – Belt drive, chain drive, gear drive

**Belt drive** – types of belt, size, specification, material, selection of type of belt, advantages and disadvantages of belt drive, calculation of length of belt and slip.

**Chain drive** – Types of chain, types of sprocket, specification of chain and sprocket, advantages and disadvantages of chain drive.

**Gear drive** – Type of gear, parts of gear, type of gear drives, specifications, advantages and disadvantages of gear drive, calculation of gear drive.

Other elements in power transmission – pulleys, shaft, bearing, clutches, keys, pins – type, specification, uses.

**Lubrications** – methods of lubrication, lubricants used, method of application, uses.

## MODULE – VIII

**Limit, Fit, Tolerance** – interchangeability, necessity in engineering field, definition BIS, definition and type of limit, terminology of limits and fits, basic size, actual size, deviation, high and low limits of size, zero line, tolerance zone.

Different standard systems of fits and limits, British standard systems, BIS systems.

Methods of expressing tolerance as per BIS.

Fit – definition, type – clearance, transition, interference – description of each.

Limit systems – hole basis and shaft basis systems.

Fundamental deviations and fundamental tolerance.

**Thread** – Types of thread, features of thread, applications of thread, thread cutting operations.

# **General Knowledge, Current Affairs & Renaissance in Kerala**

## **Facts about India**

Geography of India – Physical features – Climate – Soils – Rivers – Famous sites – etc.  
Demography – Economic and social development – Poverty alleviation – Economy and planning – etc.

History of India – Period from 1857 to 1947 – National movement

Five Year Plans

## **Facts about Kerala**

Geographical Facts – Physical features – Climate – Soils – Rivers – Famous sites – Economic and Social development – Historical importance - etc.

## **Renaissance in Kerala**

### **Important Events/Movements/Leaders**

Brahmananda Swami Sivayogi, Chattampi Swami, Sree Narayana Guru, Vagbhatananda, Thycaud Ayya, Ayya Vaikundar, Poikayil Yohannan (Kumara Guru), Ayyankali, Pandit Karuppan, Mannathu Padmanabhan, V. T. Bhattathirippad, Dr. Palpu, Kumaranasan, Vakkom Moulavi, Blessed Kuriakose Elias Chavara, Etc.

## **Current Affairs**

Important world, national and regional events related to the political and scientific fields, sports, cinema and literature etc.