GOVERNMENT OF GUJARAT
DIRECTOR OF TECHNICAL EDUCATION
CRAFTSMEN TRAINING SCHEME

Course : General Mechanic

(Fitting Turning Welding and Blacksmith)

Admission Qualification : 7th Standard Pass,
Period of Training : 2 Year
Working Hours, 45 Hours per Week
Teaching scheme period -1 hr each

Subject	Lecture/Week	:	Practical/Week
Trade Theory	7		-
Practical	-		30
Workshop Calculation	4		-
Engineering Drawing	4		-

Examination Scheme :

(1) Workshop calculation - 3 hours, 100 marks, one paper
(2) Engineering drawing - certified subject.
(3) Trade theory - 3 hours, 100 marks, one paper.
(4) Trade practice. - 6 to 8 hours practical in each Trade, 200 marks of each practical in each trade, Practical total marks: 1000 marks

Minimum marks required for passing -50% in workshop calculation
And trade theory and 60% in trade practical.

Syllabus for:

(1) Workshop calculation.

Simple problems involving addition, subtraction,
Multiplication,division and common fraction,
Decimal-addition,division,conversion of cecimal
To common fraction and vice-a-versa.
Mensuration-areas of rectangle, square,triangle,
Circle etc. Volume of simple solid bodies such as
Cube, cylinder, pyramid and one.

(2) Engineering drawing :-

Simple geometrical constructions-drawing parallels,
Ereacting perpendicular, constructing angle, triangle,
Quadrilateral, circle and polygon Division of lines
And angles, locating centre of areas etc.
Printing of letters and figures, conventional sizes, sections
Materials or theographic projection, sketching and drawing of
Plan, elevation, and views of solid a and simple machine parts
Such as bolts, nuts, rivets bearing etc. reading of blue prints.

(3) Trade theory.

(i) Fitting:

Description and application of simple measuring tools such as steel rules, calipere vernise, micrometer etc

Description of vices, types of hammers, cold chisels, files, screw driver, hacksews etc. And proper method of using them. Method of marking objects with the help of marking table, dividers, scribing blocks, vee block, centre punch, odd leg callipers etc. Methods of using drills, taps, dies, etc.descripition of standard screw threads and froms. Methods of using surface plates . Description of different types of scrappers. Different types of locking and fastening devices.e.g nutsboltsrivetsetc,andtheir uses in making jointes. Method of soldering and brazing,ferrous and non ferrous metals. Trade practice:-use of fitters hand tools, dhipping filling hacksawing, marking off. Filing true and square, filling angular and curved surfaces. Drilling-hand and machine, use of taps and dies, simpel fitting. Grinding of chiesels, use ofspanners, pliers, screw drivers, etc. Making and fitting of studs, rivetting.

(ii) Turning ;-

Drill, tapes, dies, and reamers – their types, maintenance and use Precision
measuring instrument and guage micrometer, vernier, callipers, heights guage depth gauges plug and ring guage, limit guages, screw and pitch guages center guage feeler guages etc. Spirit level .Leth ;- classification and types, size of lethe important assemblies and parts such as head stock tail stock , live and dead cen centres lead screw, bed compound rest etc. And their functions.

Lathe – accessories –chuck, face plate, steady and sliding rests job carrier, boring bar gear train. Taper turning attachments, milling attachments, tool post grinder, etc .angle plate and its function and use. Lathe tools forged and tipped. Type of lathe tools their names , description, tool materials use,care and maintenance of tools tool aggles –top rank, cutting angle, clearance angles, profile angleetc. And their importance . Tampering of tool. Granning of tools. Tools holde ers and tool posts . Plain and taper turning taper turning attachements cutteing speed and feed ,coolants.

Common screw threads-b.s.w. b.s.f. b.s.p squar, acme, buttress, seller etc.details of all standard threads. Single and multi start threads. Pitch and lead
Determination of gear train for screw cutting. Metric thread calculation. Worm screw cutting. Knurling tools-their description, us care and maintenance. Eccentric and crank shaft turning-determination of centre displacement. Method of turning split bearings methods of setting up irregular shaped articles on face plate/and angle plates for turning.

(iii) Welding:

(a) Gas Welding:

precautions in gas and electric welding, elementry knowledge of first aid. Descriotion and use of tools and equipment used in gas weldig welding terms and definitions different processes of motal joining, bolting, rivetting, soldering, brazing etc. Common gases used in welding-oxygen, hydrogen and acetylene ete. Common gases used in welding-oxygen, and acetylene etc. Types of joint care and maintenance oxy-acetylene cylinder welding, blow pipes, types description operation, care and maintenance, faults in gas welding bronze, copper, alluminimum welding and fluxes used. Principales of gas cutting wih blowpipe. Simple estimation.
Practice: simple exercises in gas welding lap joing, butt point, edge joint, open corner joint, square but joint, teem point, pipe welding, brass, copper, aluminium and cast iron welding.
Arc welding: description and use of tolls used in welding. Welding terms and definitions (advantages and advantages) electrodes-types-object of coatingcnaractristic of flur polirity methods of ineitification mportao on mprotannce and indicationd of wrong polarityrc blow ets defects –methods to ovecome in practice.
Rugolator –types –construction use care and maintenance
Tipe welding by arcand gas methods advantages
Practice : simple axercises in arc welding. Lap joint square butt joint.
Edge joint, pipe welding ,bronsc, alluminum ,stinless steck and cast iron welding .

(b) Block smithy:

The forge, different types, construction operation and maintenance. The brick hearth. Arrangements of air supply, hand belows and blower. Fuels used. Lighting and management of fire. Importance of maintraing cleane fire. Regulation of the size of fire for specific purposes. Smiths common tools and equipment, anivil, swage block, leg vive hammers tongs chisels (hot and cold) fullers, flatters, punches, drifts brass rules, square, callipers, dividers etc. Their descriotion, materials from which made and sue. Care and maintenance of tools and equipments cuages and templates and their use. Simithy operations, forging, welding and finishing heats for ging temperature heating defects under heating and over heating forging of high speed and alloy steels welds. Types of welds. Principle of braing bending of plates. Angle iron, pipes etc. Shrink fitting of rings on care wheels ect.

(4) Practices:

Lighting and management of fire. Regulating size of fire for given jobs, heating the jobs cutting, up setting, drawing and bending of atticles to given dimensions, punching and drilling, rivetting and caulking and fullering. Welds-lap, buttm scart tee etc.
Making of tools and appliances.
Making of agricultural implements, such as axes, pick axe showl etc.
Bending bar flat, angle,tee, and channel irons and pipes to given angles and radi1.
Shrink fiting of rings on bars, and brushes to given dimensions.,
Fitting of iron tyres to cart wheels.