

**SYLLABUS OF SEMESTER SYSTEM  
FOR THE TRADE OF**

**SHEET METAL WORKER**

**SEMISTER- I & II**

**Under**

**Craftsmen Training Scheme (CTS)  
(One years/Two Semesters)**

**Redesigned in  
2014**

**By  
Government of India  
Ministry of Labour & Employment (DGE&T)**

## GENERAL INFORMATION

- 1. Name of the Trade** : **SHEET METAL WORKER**
- 2. N.C.O. Code No.** : **7213.10**
- 3. Duration of Craftsmen Training** : 12 months (2 Semesters)
- 4. Power norms** : 11 KW
- 5. Space norms** : Workshop: 80 Square meter.
- 6. Entry Qualification** : Pass 8<sup>th</sup> Class Examination
- 7. Unit size (No. of student)** : 16

**8. Instructor's /Trainer's qualification Trade theory & trade practical**

(A) : Essential (any one of the below)

- (i) NTC/NAC with Three years Experience in relevant field with Craft Instructors Training Certificate.
- (ii) Diploma in Mechanical and allied with two years experience in relevant field.
- (iii) Degree in Mechanical / Metallurgy / Production Engineering/Mechatronics with one Year experience in relevant field.

(B) Desirable qualification: for (ii) & (iii) Craft Instructors Training Certificate.

**Note:**

- (i) Out of two Instructors required for the unit of 1+1, one must have Degree/Diploma and other must have NTC/NAC qualifications.
- (ii) Instructor qualification for W/shop Calculation, Engg Drawing & Employability Skill would be as per the training manual.

## **COURSE INFORMATION**

### **Introduction**

- This course is meant for the candidates who aspire to become a professional sheet metal fabricator.

### **Terminal Competencies/Deliverables:**

After successful completion of this course the trainee shall be able to perform the following skills with proper sequence.

1. Selects sheet of required type, thickness (gauge) and size and mark it with scribe, square, divider, foot rule etc., according to drawing or sample.
2. Shears wherever necessary by machine or hand shear and make it to required shape and size by bending, seaming, forming, riveting, soldering etc., using mallets, hammers, formers, sets, stakes, etc., or by various operations such as shearing, bending, beading, channelling, circle cutting.
3. Performs soldering, brazing
4. Makes sheet metal articles according to drawing or sample.
5. Makes ducts, cabins & panels
6. Undertakes Aluminium frame works
7. May undertake repair work.
8. May work in different sheet metals such as tin, copper, brass.

### **Employment opportunities:**

On successful completion of this course, the candidates shall be gain fully employed in the following sectors of industries:

1. Service industries like road transportation and Railways.
2. Automobile and body building industries
3. In public sector industries like HAL etc. and private industries.
4. Ducting and pollution control equipments manufacturing
5. Furniture and domestic utility manufacturing
6. Panels and cabinets
7. Aluminum paneling in civil & architectural works
- 9 Self employment

### **Further learning pathways:**

- On successful completion of the course they can pursue Apprenticeship training in the reputed Industries / Organisations.

## SYLLABUS FOR THE TRADE OF SHEET METAL WORKER

### SEMESTER-I

Week No	TRADE PRACTICAL	TRADE THEORY
1	<ul style="list-style-type: none"> <li>- Induction of training</li> <li>- Familiarisation with the Institute,</li> <li>- Importance of trade in Training</li> <li>- Machines used in the trade.</li> <li>- Induction to safety devices used in shop floor.</li> </ul>	<ul style="list-style-type: none"> <li>- General discipline in the institute</li> <li>- Elementary of First aid</li> <li>- Importance of the sheet metal work in the Industry.</li> <li>- General safety precautions</li> <li>- Safety precaution in sheet metal work</li> </ul>
2	<ul style="list-style-type: none"> <li>- Identification of Tools and Equipments</li> <li>- Induction and use of marking tools.</li> <li>- Practice in Reading, Steel Rule, Scribing of straight lines, Bisecting of straight lines (on the sheet metal) using marking tools.</li> </ul>	<ul style="list-style-type: none"> <li>- Metals and Non-Metals and their Characteristics,</li> <li>- Types, Sizes and uses of Sheet Metals as per BIS .</li> <li>- Use of reference table.</li> <li>- Raw material information: CRCA, HRCA &amp; MS Material</li> <li>- Terms &amp; definitions in sheet metal work.</li> </ul>
3	<ul style="list-style-type: none"> <li>- Mark and cut through the straight lines</li> <li>- Planishing of Sheet Metal and Practice in drawing simple Geometrical shapes.</li> <li>- Practice in marking and cutting of sheets to various angles.</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Marking and laying out tools and accessories</b></li> <li>- <u>Measuring Tools</u> : steel Rule, calipers, try square, L square , Micrometer, Vernier caliper, Vernier height gauge, Combination set, screw pitch gauge, radius gauge, SWG, Bevel Protractor etc.</li> <li>- <u>Marking Tools</u>: Scratch AWL, divider, Trammel point, punches etc</li> <li>- <u>Cutting tools</u> :Snips, shears, hacksaw, chisel, cutting plier, files, drills, tap &amp; die sets etc</li> </ul>
4	<ul style="list-style-type: none"> <li>- Practice on cutting with different types of snips.</li> <li>- Tin snips (Straight cut, Right cut and Left cut) cutting off inside and outside curve, cutting off notches and cutting off profiles.</li> </ul>	<ul style="list-style-type: none"> <li>- <u>Hand tools</u> : mallets, hammer, sheet metal hammers, groovers, riveting tools, screw drivers, wrench and spanners etc.</li> <li>- <u>Holding tools &amp; accessories</u>: vices,</li> <li>- C clamps, stakes, stakes holder, hollow mandrel, wooden former, Jigs &amp; fixtures, soldering bits etc</li> </ul>
5	<ul style="list-style-type: none"> <li>- Practice on Sheet Metal seams. “Grooved seam, Locked Grooved seam, Pane down seam, Bottom lock seam or Corner Fold (Knocked-up seam), Corner Clip Lock, Double Bottom Lock, Clip Lock (Cap Lock), snap Joint etc. (Folded Joints) and hemming practice</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Sheet Metal Folded Joints</b>: Description of Sheet Metal Seam, Grooved seam, Locked Grooved seam, Paned down seam, Knocked up seam inside and outside, capstrip seam, pitsburg seam etc...</li> </ul>
6	<ul style="list-style-type: none"> <li>- Forming rectangular shapes using stakes.</li> <li>- Forming Cylindrical job using various stakes such as Hollow Mandrel, Hatchet Stake; Tin Man's' Anvil stake etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Folding and joining allowances, edge stiffing, wiring allowances and false wiring, types of notches in sheet metal.</li> </ul>
7	<ul style="list-style-type: none"> <li>- Folding, Bending Sheet Metal to 90 degree using wooden mallet , 'C' clamps etc.</li> <li>- Making a radius using Wooden blocks using</li> </ul>	<ul style="list-style-type: none"> <li>- Definitions of pattern, Development, stretched out pattern, Master pattern(gross pattern) and templates</li> </ul>

	<p>Hairpin Folder.</p> <ul style="list-style-type: none"> <li>- Making a cylindrical container with knocked- up, bottom (Bottom Locked), Grooved Joint and hemmed Top.</li> <li>- Forming frustum of Cone.</li> <li>- Making of Mug, scoop, measuring can</li> <li>- Hemming (single, Double) wire edge by hand process</li> </ul>	<ul style="list-style-type: none"> <li>- Development of by parallel line method, radial line method,</li> </ul>
8	<ul style="list-style-type: none"> <li>- Make a taper chute square to rectangle transition.</li> <li>- Make a taper chute square to round.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Development of surfaces: Triangulation method and geometrical construction methods</li> <li>-</li> </ul>
9	<ul style="list-style-type: none"> <li>- Making holes with solid punches, round punches as per BIS and use of hollow punches</li> <li>- Making hole in sheet metal with help of wood block.</li> </ul>	<ul style="list-style-type: none"> <li>- Solid and Hollow Punches. Description of hand punches as per BIS. Sizes of solid and hollow Punches and their uses.</li> </ul>
10	<ul style="list-style-type: none"> <li>- Riveting practice using various types of rivet heads.</li> <li>- Single chain riveted joint. Double chain and Zig- zag, Lap &amp; butt riveted joints</li> <li>- Making a dust pan ( Corner and handle riveted)</li> <li>- Making a fire bucket with lap riveted joint on one side and Locked Grooved Seam on the other side. Bottom Hollowing and Bottom Lock Seam.</li> </ul>	<ul style="list-style-type: none"> <li>- Rivets and its parts, Selection of Rivet heads. Types of Rivet and their uses.</li> <li>- Standard sizes of Rivets and Riveting Tools.</li> <li>- Calculation for Riveting allowances (pitch and Lap)</li> </ul>
11	<ul style="list-style-type: none"> <li>- Solder Lap joint</li> <li>- Single plated solder butt joint</li> </ul>	<ul style="list-style-type: none"> <li>- Fastening of Sheet Metal:.</li> <li>- Self tapping screws, Clips and Connectors; Their uses, Types and Allowance of 'S' Clips, Government Clips, Drive Clips, Mailing Clips etc.</li> </ul>
12	<ul style="list-style-type: none"> <li>- Making an oil Can by hand process by soldering</li> <li>- Making funnel by soldering process</li> </ul>	<ul style="list-style-type: none"> <li>- Solder, Different types of solder and their composition. Types and uses of fluxes, their effect on different metal.</li> </ul>
13	<ul style="list-style-type: none"> <li>- Make by soldering Elbow 90° equal dia pipe T joint 90° equal dia pipe T joint 90° unequal dia pipe by soldering</li> </ul>	<ul style="list-style-type: none"> <li>- Process of soft soldering, hard soldering (brazing).</li> <li>- Heating appliances (Hand Forge, Blow Lamp, L.P.G.)</li> </ul>
14	<ul style="list-style-type: none"> <li>- Make by soldering T Pipe 60° branch joint unequal dia pipe Offset T joint equal dia</li> </ul>	<ul style="list-style-type: none"> <li>- Development &amp; laying out pattern of elbow pipe, T pipe and offset pipe in equal diameter.</li> </ul>
15	<ul style="list-style-type: none"> <li>- Make a taper lobster back bend 90 degree from oblique cone by soldering</li> </ul>	<ul style="list-style-type: none"> <li>- Development of T pipe, round equal and unequal.</li> <li>- Introduction to tubes and pipes.</li> </ul>
16	<ul style="list-style-type: none"> <li>- Forming square section segmental quarter bend pipe with suitable lock and forming round section segmental quarter bend pipe</li> </ul>	<ul style="list-style-type: none"> <li>- Laying out pattern of 600 off-set 'T' pipe. Pattern Development of 'Y' pipe.</li> <li>- Preparation of pickling solution. Protection-Coating, Cleaning and preparing of Sheet Metals Corrosion and anti corrosion treatment of sheet metal.</li> <li>-</li> </ul>

17	- Making a square duct elbow with snap block	- Method of galvanizing, tinning, anodising, sheradising and Electroplating.
18	- Make a conical hopper by soldering	- Development and laying out of pattern of segmental quarter bend pipe
19	- Setting up of Oxy-acetylene plant and types of flames	- Need for ducting. Places where ducting is employed and the working principle of a dust cyclone, Gutter and its use. False ceiling,
20	- Setting up of Arc welding plant and striking & maintaining the arc & laying short beads	- Safety precaution in gas & arc welding - Description of Oxyacetylene plant and the equipments, accessories & tools
21	- Fusion run with/without filler rod in flat position. - Square butt joint in flat position by gas.	- Types of oxy-acetylene flames & its uses - Types and description of flux - Types of welding blow pipes .& its functions
22	- Brazing copper sheet in lap joint in flat position	- Various types of pipe joints. - Method of metal preparation & cleaning the base metal before welding. - Gas welding defects causes & remedies. - Arc welding defects causes & remedies.
23	<b>Industrial Training / Project Work</b>	
24	<b>Industrial Training / Project Work</b>	
25	<b>Revision</b>	<b>Revision</b>
26	<b>Test</b>	<b>Test</b>

**SYLLABUS FOR THE TRADE OF SHEET METAL WORKER**  
**SEMESTER-II**

Week No	TRADE PRACTICAL	TRADE THEORY
1	<ul style="list-style-type: none"> <li>- Importance of machinery used in the trade.</li> <li>- Types of job made by the trainees in trade</li> <li>- Introduction to machinery safety including fire fighting equipment and their uses etc</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Importance of the trade in the development of Industrial Economy of the Country.</li> <li>- Review of Types of sheet metal Fabrication.</li> <li>- Methods of developments.</li> </ul>
2	<ul style="list-style-type: none"> <li>- Locked groove joint by aluminum sheet</li> <li>- Single riveted lap joint by aluminum sheet.</li> <li>- Double strap single row riveted butt joint by aluminum sheet</li> </ul>	<ul style="list-style-type: none"> <li>- Introduction to Aluminum fabrication, and its applications.</li> <li>- Ferrous and Non-Ferrous metals. Use of Copper and Alloys.</li> <li>- Laying out pattern of conical elbows. Pattern development of lobster back bend.</li> <li>- Chemical and Physical properties of Aluminium.</li> <li>- Use of Aluminium and its Alloys</li> </ul>
3	<ul style="list-style-type: none"> <li>- Exercise involving practical work on Aluminium Sheet, and using Pop Rivet.</li> <li>- Aluminium Windows with. different extruded sections, Aluminium Soldering.</li> </ul>	<ul style="list-style-type: none"> <li>- Brief Description of hand punch machine. Hand and Power operated drilling Machines. Drill Bits, parts and effects of cutting angles.</li> <li>- Angles for Drilling Sheet Metals, effect of speed, Feed Cutting Fluids, etc., on metals.</li> <li>- Difference between drilled and punched holes</li> <li>-</li> </ul>
4	<ul style="list-style-type: none"> <li>- Making holes in sheet metal using Punching Machine.</li> <li>- Making holes in sheets with a twist drill.</li> <li>- Tri-paning with use of hand and electric drilling machine. Grinding a drill bit</li> <li>- Practice in Drilling Holes in walls and Ceilings as applied to ducting work.</li> <li>- Use of rawl bits and rawl plug.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Description of swaging and beading machine, its parts, operating principles etc.</li> <li>- Description of Fly Ball press. Operating Principles of Power Press and press brakes.</li> <li>- Method to calculate the pressure adjustment. Clearance between Die and Punch.</li> <li>- Introduction to “C” and “H” frame presses</li> </ul>
5	<ul style="list-style-type: none"> <li>- Practice on hollowing and raising on non-ferrous sheet as well as ferrous sheet.</li> <li>- Practice on removing dents of spherical or hemi-spherical articles using wheeling and raising machine. (Repairing mud guards etc.)</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Properties of stainless steel and its uses.</li> <li>- Properties and uses of tin, lead, zinc and silver.</li> <li>- Description and Physical properties of Muntz Metal, Gun Metal, White Metal etc</li> </ul>
6	<ul style="list-style-type: none"> <li>- Practice on pipe bending by hand. Pipe bending using Hydraulic Pipe bending' machine .</li> <li>- Development of a cone: Cylinder fitted to a cone. Equal dia pipe joint with crimping and Ogee beading.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Introduction to pipe/tube bending.</li> <li>- Brief description of Hydraulic pipe bending machine. Operating Principles etc.</li> <li>- Description of roll forming machine types and operating principles, description of slip roll forming machine and its function</li> </ul>
7	<ul style="list-style-type: none"> <li>- Practice on external threading using “Die stock”.</li> <li>- Practice on internal threading using taps.</li> <li>- Typical folding, Bending Practice, Making</li> </ul>	<ul style="list-style-type: none"> <li>- Use of Die and Die Holder, Description of taps and tap wrench.</li> </ul>

	<p>Steel-Racks, Reinforcement with angle iron.</p> <ul style="list-style-type: none"> <li>- Use of self tapping screws and other fasteners.</li> </ul>	
8	<ul style="list-style-type: none"> <li>- Project work such as Steel Stool, Aluminium Ladder etc.</li> <li>- Metal Spinning: Making a cylindrical medicine container of Aluminium Sheet</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Method to operate folding/brake folder for typical folding.</li> <li>- Description and use of jigs and fixtures</li> </ul>
9	<ul style="list-style-type: none"> <li>- Making a Copper article by use of power press and also making brass and stainless steel articles.</li> <li>- Practice of Buffing and polishing</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Definition of Planishing and its application. Brief description of polishing machine. Various types of bobs and polishing compounds</li> </ul>
10	<ul style="list-style-type: none"> <li>- Angle iron bending in different angles and different radii. Twisting the M.S. square rod and flats.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Operating principles of spinning lathe. Description of spinning</li> </ul>
11	<ul style="list-style-type: none"> <li>- Gas welding Square butt joint on M.S. sheet in down hand position . Fillet Tee &amp; Lap joint on M.S sheet in down hand position.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Different process of metal joining types of weld joint &amp; weld positions. Oxy-acetylene welding equipments &amp; application ,Types of flame&amp; their uses .</li> </ul>
12	<ul style="list-style-type: none"> <li>- Pipe butt joint in down hand position</li> <li>- Butt joint on MS flat in down hand position by arc</li> <li>- Fillet lap and T joint on MS flat in down hand position</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Principle of arc welding. Types of welding machines and their uses. Advantages and disadvantages of AC/DC welding machines.</li> <li>- Arc length and its importance</li> <li>- Welding defects</li> </ul>
13	<ul style="list-style-type: none"> <li>- Resistance welding. Spot welding, seam welding.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Principle of resistance welding. Types and applications. Welding symbols</li> </ul>
14	<ul style="list-style-type: none"> <li>- CO<sub>2</sub> welding. Deposit bead on MS sheet in flat position. Lap joint T joint and butt joint in down hand position.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Introduction to CO<sub>2</sub> welding process. Welding equipments and accessories. Advantages and application of CO<sub>2</sub> process.</li> </ul>
15	<ul style="list-style-type: none"> <li>- TIG welding. Deposit bead on SS sheet in flat position. Making butt, Tee and corner joint.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- TIG welding process. Advantages. Description of equipments. Types of polarity and application</li> </ul>
16	<ul style="list-style-type: none"> <li>- TIG welding. Deposit bead on Aluminium sheet in flat position. Making butt, Tee and corner joint.</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Types of Tungsten Electrodes, Filler rods, Shielding Gases.</li> <li>- Defects, causes and remedy in TIG welding process</li> </ul>
17	<ul style="list-style-type: none"> <li>- MS/SS pipe butt and Y joint by TIG welding process.</li> </ul>	<ul style="list-style-type: none"> <li>- Latest sheet metal cutting techniques: Plasma cutting, Laser cutting, water jet cutting and punching etc.</li> </ul>
18	<ul style="list-style-type: none"> <li>- Make models of Aluminium sliding windows and doors.</li> </ul>	<ul style="list-style-type: none"> <li>- Specification of aluminium channels angles, strips, tubes beadings, packing rubber, cardboard, glasses etc.</li> </ul>
19	<ul style="list-style-type: none"> <li>- Partitions of mini model rooms by using aluminum channels beadings etc</li> </ul>	<ul style="list-style-type: none"> <li>- Tools and equipments used in aluminium fabrication.</li> <li>- Assembly &amp; Sub assembly: Gaarding assembly, Door assembly, Chassis assembly, Cabinet assembly, Power pack assembly etc.</li> </ul>



20	- Electrical Panel, trunk boxes & ducts fabrication and Painting .	- Process of painting. Spray painting. Etch primer painting, Powder coating, buffing, grinding, and sanding. - Selection of different grit sizes.
21	- Any Special Exercises: Repairing Mudguard and Radiators and testing of Sheet metal containers	- Types of Radiators and construction of Radiators, Mufflers, Estimation of work.
22	- Any Special Exercises: Repairing Blocked Silencer and fuel tank	- Material handling: handling of light, medium and heavy materials. - Use of cranes and types. - Estimation and costing
23	- Industrial training / Project work	
24	- Industrial training / Project work	
25	<b>Revision</b>	
26	<b>Test</b>	

**FOR SEMESTER I & II**  
**(For a Unit of 16 trainees + one)**

<b>S. No</b>	<b>Name of the Tools</b>	<b>Quantity</b>
<b>TRAINEES KIT</b>		
1	Steel Rule 300 mm	16+1
2	Wing Divider 200 mm	16+1
3	Centre Punch 100 mm	16+1
4	Spring Dividers 150 mm	16+1
5	Ordinary Wooden Mallet	16+1
6	Soldering Copper Hatchet Type 0.25 kg	16+1
7	Cross Peen Hammer 0.25 kg with handle	16+1
8	Protractor with blade 150mm	16+1
9	Steel tape 2 metres	16+1
10	Ballpene hammer 0.5kg with handle	16+1
11	Scriber 150 mm x 3 mm (Engineer's)	16+1
12	Prick punch 100mm	16+1
<b>SHOP OUT FIT PER UNIT</b>		
13	Steel Square 450 mm x 600 mm	4 Nos.
14	Sheet Metal Gauge	1 No
15	Hatcher Stake	4 Nos.
16	Stake Round and Bottom	4 Nos.
17	Half Moon Stake	4 Nos.
18	Funnel Stake	4 Nos.
19	Anvil Face Stake	4 Nos.
20	Bick Iron Stake	4 Nos.
21	Tinman's Horse	2 Nos.
22	Hammer Peaning with handle	4 Nos.
23	Hammer Creasing with handle	4 Nos.
24	Hammer Planishing with handle	4 Nos.
25	Hammer Block with handle	2 Nos.
26	Shear Tinman 300mm	8 Nos
27	Snip straight	8 Nos
28	Right cut snips 250mm	4 Nos
29	Left cut snips 250mm	4 Nos
30	Hand Shear Universal 250 mmID	4 Nos.
31	Hollow Punch set Round 3 mm Dia	2 Nos.
32	Rivet sets snap and Dolly combined 3 mm	4 Nos.
33	Chisel cold flat 25 mm x 250 mm .	4 Nos
34	Punch Letter 4 mm	1 set
35	Punch Number 4 mm	1 set
36	File flat 250 mm second cut	2 Nos.
37	File flat 250 mm smooth	2 Nos.
38	File flat 300 mm bastard	2 Nos.
39	File half round 300 mm smooth	2 Nos.
40	Hacksaw frame 300 mm adjustable (Tubular)	4 Nos.

41	Hand Groover 5 mm	4 Nos.
42	Plier.Combination 150 mm	2 Nos.
43	Grip Wrench 200 mmID	2 .Nos.
44	Ladle 150 mm Dia.	2 Nos
45	Blow Lamp 1 litre.	2 Nos
46	H.S.S. Twist Drill 3 mm, 4 mm & 6 mm each (parallel Shank)	3 Nos.
47	Hand Drill machine 0 to 12 mm	2 Nos.
48	Soldering Copper Hatchet type 500 gms.	8 Nos
49	Pneumatic rivet gun	2 Nos.
50	Trammel Point (with beam 600 mm)	1 No.
51	Vernier caliper (0 mm - 150 rom)	1 No
52	Micrometer Outside (0 to 25 mm)	1 No.
53	File Rasp cut 250 mm	2 Nos.
54	D.E. Spanner G.P. (6 mm to 32 mm) (Set of 12 spanner)	2 Set
55	Bossing Mallet	4 Nos
56	End tacked Mallet	4 Nos
57	Soft hammer (Brass, copper, Lead)	4 Nos
58	Steel Rule 600mm	4 Nos
59	Oilcan pressure feed 500ml	2Nos
60	Raising hammer with handle	4 Nos
61	Rawl Punch holder and bits (No.8, 10, 12, 14)	2 . Sets
62	Hollowing Hammer with handle	4 Nos.
63	Tripaning tool 70 mm	1 No.
64	Hand vice 50 mm	4 Nos.
65	Tongs Flat	2 Pairs.
66	Portable Electric drill (Single phase) -6mm	2 Nos
67	Pop rivet gun	2 Nos.
68	Lazy Tong	2 Nos.
69	Screw Driver 250 mm	2 Nos.
70	Round File 2nd Cut 250 mm	4 Nos.
71	Triangular File 'Smooth 250 mm	4 Nos.
72	Square File 2nd Cut 250 mm.	4 Nos.
73	Needle File (Swiss File) 150 mm	1 set
74	'C' Clamp 150 mm	2 Nos.
<b>GENERAL INSTALLATIONS</b>		
75	Bench leaver shears 250 mm Blade x 3mm Capacity	1 No.
76	Air Compressor (Pressure and displacement of air) Pneumatic Pop rivet Gun	1 . No
77	Spray Gun.(painting) 500 ml.	1 No.
78	Combination turning up and wiring machine	1 No.
79	Guillotine. Shearing Machine foot operated	1 No.
80	Oxy acetylene welding plant (complete set)	1 set
81	Circle cutting machine 300 mm dia	1 set
82	Pillar type drilling machine 12 mm	1 No.
83	Slip roll former 1.6. mm x 1000 mm	1 No.
84	D.E. Grinder Pedestal motorised 200 mm	1 No.
85	Anvil 50 kgs with Stand	1 No.
86	Bench vice 120 mm, 150 mm	2 each

87	Fly press Ball press No.4 single body	1 No.
88	Power Press 2 Tons	1 No.
89	Buffing and Polishing Machine	1 No.
90	Nibbling Machine	1 No.
91	Spinning Lathe	1 No.
92	Seaming Machine .	1 No.
93	Glass cutter – Diamond point	1 No.
94	Work Bench 1820 x 1310 x 760 mm	4 Nos.
95	Almirah 1820 x 1210 x 450 mm	2 Nos.
96	Metal rack 1820 x 1520 x 450 mm	2 Nos.
97	Steel Lockers with 8 Drawers .	2 Nos.
98	Fire extinguisher Soda Acid and foam type	1 each
100	Fire buckets with Stand.	4, Nos.
101	Black Board with Easel .	1 No.
102	Wooden Stool 450.mm.	1 No.
103	Portable Nibbler	2 Nos.
104	Portable Pneumatic Shear.	2 Nos.
105	Pipe Bending Machine (Hydraulic Type) 12 mm to 30 mm	1 No.
106	Hand Press Brake Capacity (0.8 mm)	1 No.
107	Beading Machine with 380 mm throat clearance (with crimping rollers)	1 No.
108	Tin . smiths bench folder 600 x 1.6 mm	1 No.
109	Gas Welding Table 1220 mm x 760 mm	1 No.
110	Spot Welding Machine	1 No.
111	Arc welding Transformer/ Rectifier/Inverter 300Amps with accessories	1 set
112	Co <sub>2</sub> welding machine complete set 300Amps	1 set
113	TIG welding machine complete set 200 Amps	1 set
114	Universal cutting machine	1 No.

### CLASS ROOM FURNITURE FOR TRADE THEORY

Sl. No	Names & Description of Furniture	Quantity
1	Instructor's table and Chair (Steel)	1 set
2	white magnetic board size 1200mm X 900 mm	1
3	Instructors lap top with latest configuration pre loaded with O.S and MS Office package.	1
4	LCD projector with screen	1

## LIST OF TRADE COMMITTEE MEMBERS

Sl. No	Names & Designation	Organisation	Remarks
<b>Members of Sector Mentor council</b>			
1	Dr.G.Buvashekar	AGM, WRI, Trichy - Chairman	Chairman
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5	Dr.Rajeev kumar	IIT, Mandi	Member
6	Dr.Vishalchauh	IIT, Mandi	Member
7	Shri D.K.Singh	ITI, Kanpur	Member
8	Shri. Navneet Arora	IIT, Roorkee	Member
9	Shri. R. K. Sharma	Head, SDC, JBM Group, Faridabad	Member
10	Shri. Puneet Sinha	Deputy Director, MSME, New Delhi	Member
<b>Mentor</b>			
1	Shri.Deepankar Mallick	Director of Training, DGE&T Hq,	Mentor
<b>Members of Core Group</b>			
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2	Shri. M Kumaravel	DDT, FTI , Bangalore	Team Leader
3	Shri.SushilKumar	DDT, DGE&T Hq,	Member
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5	Shri.V.L. Ponmozhi	TO, CTI, Chennai	Member
6	Shri.D.Pani	TO, ATI, Howrah	Member
7	Shri.Amar Singh	TO, ATI, Ludhiyana	Member
8	Shri.Gopalakrishnan	TO, NIMI, Chennai	Member
9	Shri.Balachandran achari A.V	Principal, ITI, Kottayam, Kerala	Member
10	Shri.Pazhanimurugan. P	JTO, GITI, K.G.F. Karnataka	Member