Workshop Practice

[Practical Part of Basic Vocational Group of Class XI]

[House Wiring/Fitting/Welding/Carpentry (Any three)]

Total no. of weeks for classes/year : 36		
Classes Per Week: 9	**Theoretical: 0**	**Practical : 9**
Total Classes Per Year: 324	**Theoretical: 0**	**Practical : 324**
Total Marks: 50	**Theoretical: 0**	**Practical : 50**

Carpentry Shop :

1. **Demonstration of common wood** available in the market e.g. Teak, Sal, Deodar, Gummer, Mehogany, Jarul etc.

2. **Identification and use of** :

   a) **Various hand tools used in carpentry shop** – Try square, Folding Rule, Scriber, Mortise Gauge, Straight Edge.

   b) **Various cutting and planning tools used in carpentry shop** – Cross cut saw, Rip saw, Tenon saw, Wood jack plane, Iron jack plane, Smoothing plane.

   c) **Various chisel used in carpentry shop** – Firmer Chisel, Mortise Chisel, Dovetail Chisel.

   d) **Various holding & supporting tools used in carpentry shop** – Carpenter's Vice, Working Bench, Bench hook, Bar-clamp, G-cramp.

   e) **Various boring tools used in carpentry shop** – Augur, Gilmet, Bradawl, Wheel brace & bits (Twist bit, Centre bit, Counter sink bit, Expansion bit).

   f) **Miscellaneous tools used in carpentry shop** – Warrington hammer, Claw hammer, Mallet, Screw driver, Pincer, Rasp File.

   g) **Auxiliary materials used in carpentry shop** – Nails, Dowels, Screw, Bolt, Nut& Glue.

3. **Practical Job :**

   i. Layout, marking, sawing &planing as shown in figure 1.

   ii. Preparation & construction of any two of the following joints –

   a) T-lap joint (figure -2)

   b) Cross lap joint (figure- 3)

c) Mortise & Tenon joint (figure -4)

d) Lap-Dovetail joint (figure-5)

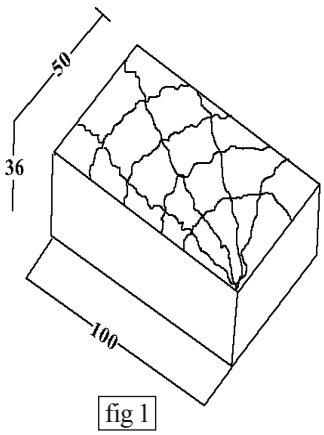


fig 1

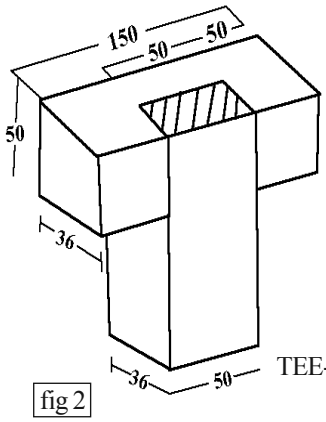


fig 2

TEE-LAP JOINT

A & B are identical

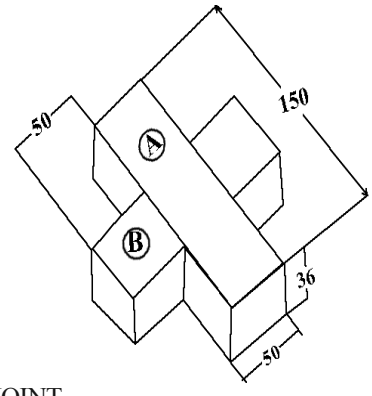
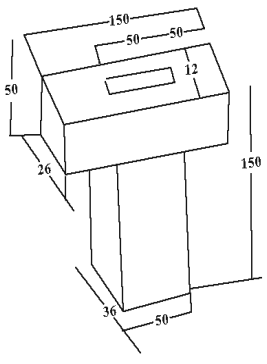
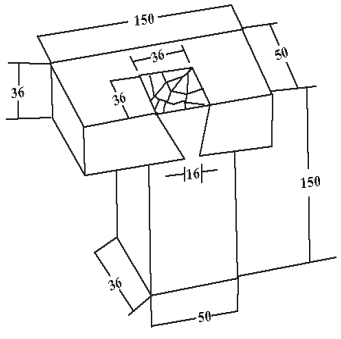


fig 3



MORTILES & TENUN JOINT

fig 6



TEE-DOVETAIL JOINT

fig 5

Welding Shop

1. Identification of AC & DC welding machine, their characteristics & field of applications. 2. Knowledge of safety precautions to be taken during arc welding.
3. Identification of various tools & accessories used in arc welding.
4. Demonstration of the connections of various accessories with the welding machine.
5. Demonstration of various methods of cleaning before welding & their importance.
6. Meaning of polarity & their use to be demonstrated. Duty cycle of welding machine.
7. Identification of different types of coated electrode.
8. Demonstration & practice of various arc (Short, long & normal) and effect of arc length on welding performance.
9. Removing of slag after arc welding.

10.Selection of electrode and current rating for the welding of various plate thic-nesses.

Plate thickness in mm	Size of electrode in mm	Current rating in amp
1.6	1.6	40-60
2.5	2.5	50-80
4.0	3.2	90-130
6.0	4.0	120-170
8.0	5.0	180-270
25	6.0	300-400

11. Straight beading by arc welding.

12. **Practical Job:** (Any three of the following)

a) Lap joint by parallel fillet welding (Figure-1).

b) Lap joint by combined parallel fillet and transvers welding (Figure – 2)

c) Square butt joint by arc welding (Figure-3)

d) T-fillet joint by arc welding (figure-4)

parallal fillet

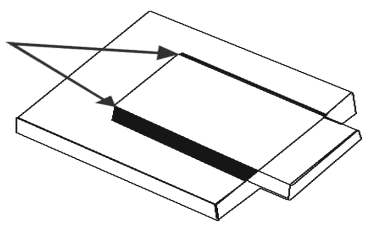
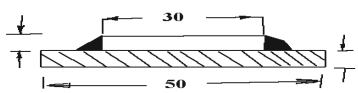
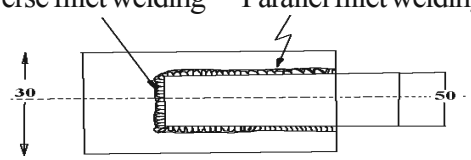


fig 1



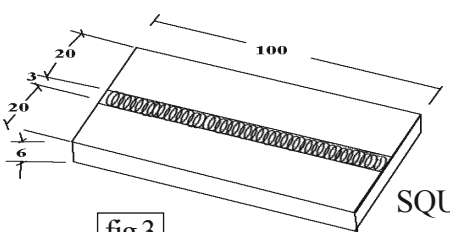
PARALLEL FILLET WELDING

Transverse fillet welding Parallel fillet welding



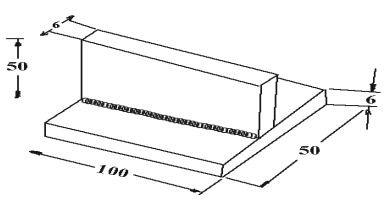
COMBINED TRANSVERSE AND PARALLEL FILLET WELDING

fig 2



SQUARE BUTT JOINT

fig 3



TEE-FILLET JOINT WELDING

fig 4

Fitting Shop:

1. Identification & use of various types of file, hacksaw, vice, hammer, tap used in fitting shop.
2. Purpose of limit system, Classification of fits as per BIS system, Hole basis system & shaft basis system.
3. Practice on measuring of heights with Vernier Height Gauge.
4. Practice on measuring of angles with Bevel Protector.
5. **Practical Job:** (Any three of the following)
   a) Sawing and filing practice (Figure-1).
   b) Preparing of any two of the following jobs:
      i) Making of a gauge (Figure-2).
      ii) Making of a job as shown in Figure-3.
      iii) Making of a "Triangular open fit joint" (Figure-4).
      iv) Making of a "Tongue & Groove assembly" (Figure-5).

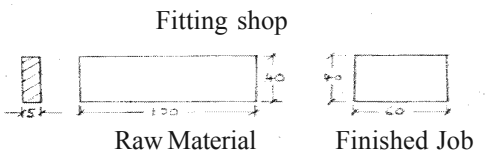


fig 1

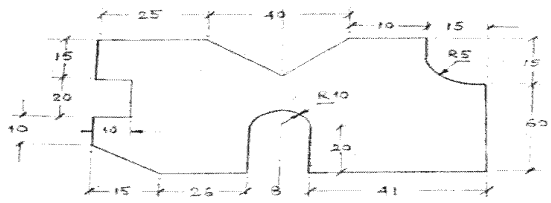


fig 2 Gauge

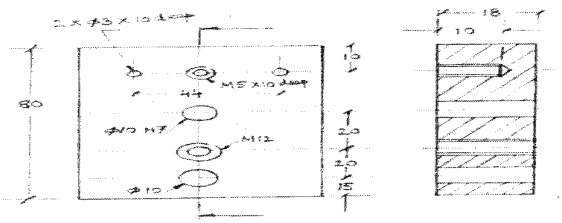
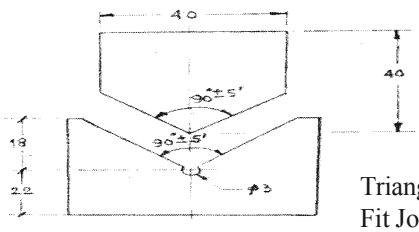
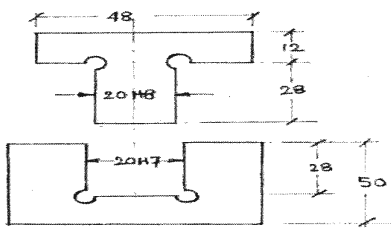


fig 3



Triangular Open Fit Joint

fig 4



Tongue & Groove Assy.

fig 5

Reference Books:

Name of Authors	Title of the Book	Name of the Publisher
S.K. Hazra	Work Shop Technology Volume I & II Latest	Mediapromoters, Mumbai
Raghuwanshi	Work Shop Technology Volume I & II Latest	Dhanpath Rai & Sons
Gupta	Production Technology	Sayta Prakasani
Bawa	Manufacturing Processes	Tata McGraw-Hill
Ali Hasan & R.A. Khan	Manufacturing Processes	ScitechPub. Chenni

House Wiring:

(Item 1 & 2 are compulsory and Any one from 3, 4, 5)

Job-1 Study & Use of Wiring Accessories – P.V.C wire, Grade of wire, Size of wire, Main switch (ICDP, ICTP&N), Solid & Stranded conductor, Single pole & Double pole switch, Different types of switches, Miniature circuit breaker (M.C.B), Different types of fuses, Cut-out, Fuse-grip, Ceiling rose, Lamp holder, Different types of plug, Size of PVC Conduit, Size of PVC Casing, Saddle, Conduit bend, Conduit coupler, Inspection box, Distribution board (ICDB), Bus bar chamber, Rising main, Live wire, Neutral wire, Earth wire, Switchboard, Various symbols associated with various components of wiring.

Job-2 Testing of Electrical Installation – Continuity test of wiring, Continuity test of conduit, Polarity test of single pole switch by test lamp, Polarity test of single pole switch, Earth continuity test, Insulation resistance test between conductors, Insulation resistance test between conductor and earth by Megger. Study the necessary I.E. rules for domestic wiring and earthing.

Job-3 To make Domestic Wiring –To make a wiring circuit using PVC wire and Conduit for one Lamp point, one Fan point with regulator and one 3-pin plug point. The wiring includes Main switch & Switchboard. Prepare a chart for listing of the materials used with their specification and symbols.

Job-4 Application of different types of switch connections – Control of a light/fan point using one switch, Control of a light point from two different places, Control of a light point from more than two different places, Switching of two or more lamps by a single switch, Connection of bed switch, Series & Parallel connection of lamps.

Job-5 To make Fluorescent lamp connection –

a) To study and make the circuit of single Fluorescent lamp and connect it through a switch using casing wiring. Function of Choke coil and Starter. Use of electronic ballast and electromagnetic ballast to make the circuit. Check the circuit with necessary tests before giving supply.

b) To study and make the circuit of two Fluorescent lamps together and connect it through a switch using casing wiring. Check the circuit with necessary tests before giving supply.

Reference Books:

1. Electrical Installation Estimating & Costing – J.B. Gupta – S.K. Kataria Publication.
2. Electrical Installation Estimating & Costing – S. Singh – Dhanpat Rai Publication.
3. Basic Electrical Engineering (Vol-I) – P.S. Dhogal, S.K. Mandal – Tata McGraw Hill Publication.
4. Electric Wiring – S. Samaddar – New Central Book Agency (P) Ltd.

Project work:

Preparation of Project Report of any two of the following business -

(i) Construction of 1KM. two lane road,

(ii) Construction of two storied residential building.

(iii) Sanitary & Plumbing work of a school building.

Reference book :

Name	Authors	Publisher
Surveying and Levelling	N.N.Basak	Tata Mc Graw-Hill
Surveying and Levelling part I and II	T .P. Kanetkar & S.V.Kulkarni	Pune Vidhyarthi Griha Prakashan
Surveying and Levelling vol. I and II	Dr. B. C. Punmia	Laxmi Plublication
Text book of Surveying	S.K.Husain, M.S. Nagaraj	S. Chand and company
Surveying and Levelling vol. I and II	S. K. Duggal	Tata Mc Graw-Hill
Fundamental of surveying	S.K.Roy	PHI
Plane surveying	A.M.Chandra	New age international Publishers