

13<sup>th</sup> June

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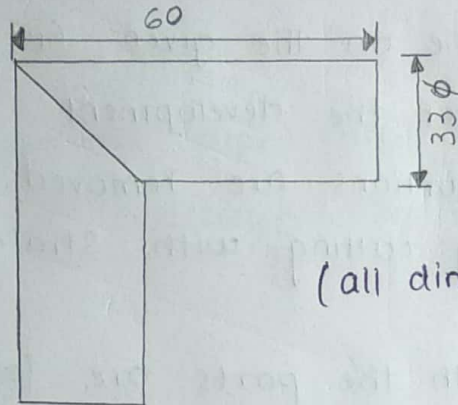
## PIPE JOINT

Branch & sec: CSE - 4

Aim: To prepare a 90°- pipe joint of 33mm.

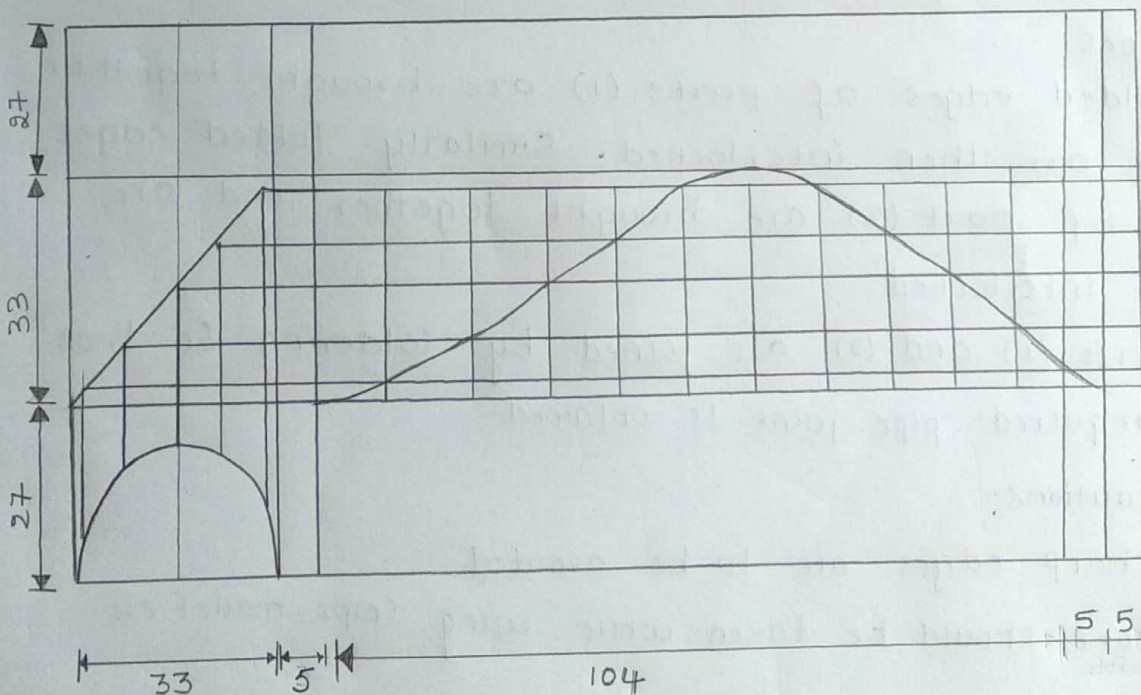
Tools required: steel rule, scriber, try square, divider, nylon mallet, straight snip and curved snip.

Sketch of the product:



(all dimensions are in mm)

Development of the product:



Work material required: GI sheet of 152mm x 87mm



- Sequence of operations:
- 1) marking
  - 2) cutting
  - 3) edge folding
  - 4) Bending
  - 5) edge interlocking
  - 6) soldering

procedure:

- 1) Marking is done on the given G.I sheet using scriber try square as per the development.
- 2) The hatched portions are removed and parts (1) & (2) are obtained by cutting with straight snip and curved snip.
- 3) Edges of both the parts are folded appropriately.
- 4) Both the parts are bent to form a cylindrical shapes.
- 5) folded edges of parts (1) are brought together and are then interlocked. Similarly folded edges are of part (2) are brought together and are then interlocked.
- 6) parts (1) and (2) are joined by soldering so that the required pipe joint is obtained.

precautions:

- 1) Sharp edges are to be avoided.
- 2) care should be taken while using snips, mallet etc.

calculations:

$$\begin{aligned}\text{total area of sheet} &= 152 \times 87 \text{ mm}^2 \\ &= 13224 \text{ mm}^2\end{aligned}$$

$$\% \text{ Waste factor} = \frac{\text{Wastage area}}{\text{total area}} \times 100$$

$$= \frac{33 \times 87}{152 \times 87} \times 100$$

$$= \frac{33}{152} \times 100 = 0.217 \times 100$$

$$= 21.7\%$$

$\therefore$  % of waste factor is 21.7%.

Result: The required pipe joint is obtained with a factor of wastage 21.7%.



## SEMI CIRCULAR FIT:

Aim: To make a half round fit (for semi circular fit)

Tools required: Steel rule, scribes, dot punch, hammer, hack saw frame with blade, try square, flat bastard file, half round file, divider.

Sequence of operations:

- 1) edge preparation
- 2) Marking
- 3) dot punching
- 4) cutting
- 5) filing
- 6) finishing.

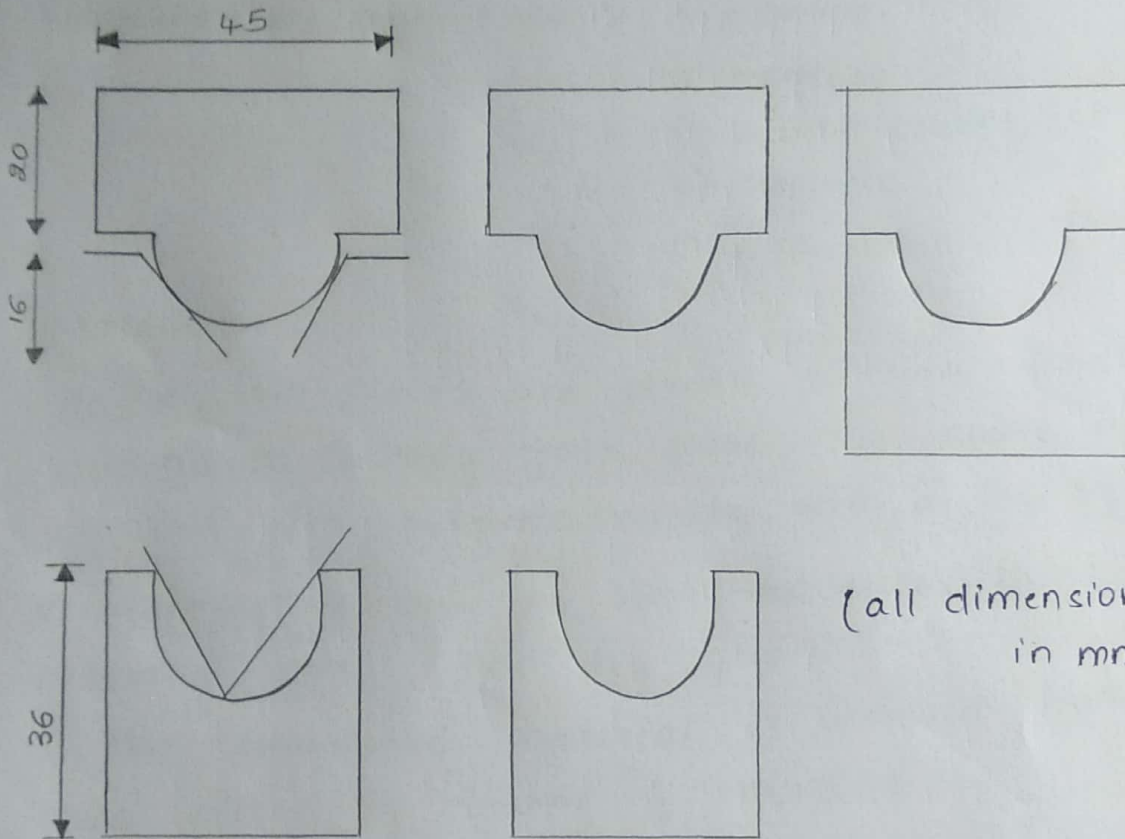
work material required: Two M.S plates of 36mm x 45mm each

procedure:

- 1) two adjacent edges of each work piece are filed with bastard file. Straightness and perpendicularity are checked using try square.
- 2) CaCO<sub>3</sub> is applied to the surfaces of the two pieces. After drying, marking is done with reference to the prepared edges using try square and scribe.
- 3) Using dot punch, punching is done on both the pieces along the salient markings. Indicating material is to be removed.
- 4) cutting is done, along the lines of cut, using hack saw there by maximum possible unwanted material is removed in less time.

5) Excess material is removed by filing with a half round file.

6) The edges of both the pieces which come in contact are still finished to have a perfect fit and the average overall dimensions of each parts are filed to  $56 \times 45 \text{ mm}$ .



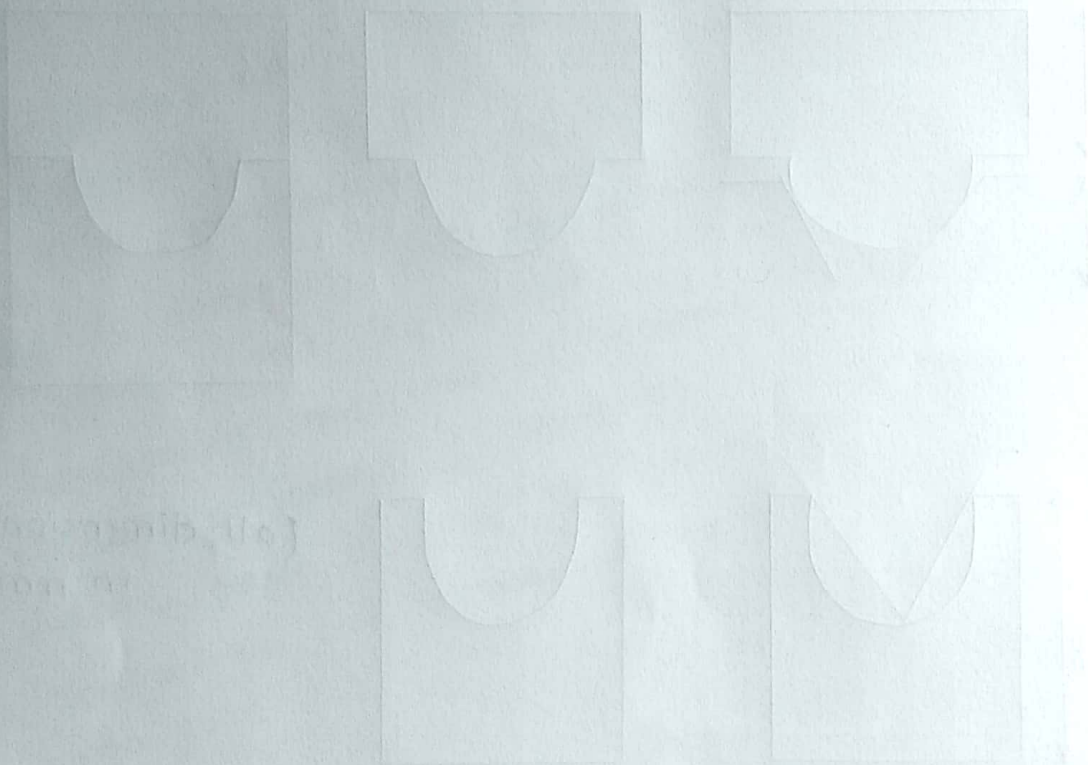
precautions:-

- 1) select hack saw blade with appropriate pitch
- 2) Hack saw blade is inserted in the hacksaw frame in correct direction.
- 3) Apply force only in the forward cutting stroke.
- 4) Cut a small groove with a file in sharp corners where a saw cut is to be started.
- 5) Use file with a properly fitted tight handle.
- 6) check whether the handle of the hammer is



Securely wedged or not.

Result: The required Semi circular fit is made satisfactorily.



## MORTISE & TENON JOINT

Aim: To prepare a mortise and tenon joint

Tools required: Jack plane, marking gauge, wood rasp file, try square, firmer chisel, mortise chisel, wooden mallet, handsaw

Sequence of operations:

- 1) planing
- 2) Marking
- 3) cutting (sawing & chiselling)
- 4) finishing
- 5) Assembling

procedure:

- 1) The two pieces are planed to have final dimensions & using Jack plane. The sides are checked for perpendicularity with a try square
- 2) Marking is done on both the pieces using marking gauge, and try square.
- 3) The unwanted material is removed from the two pieces by sawing & chiselling
- 4) The mating parts of the two pieces are finished
- 5) The two pieces are assembled to form mortise and tenon joint.

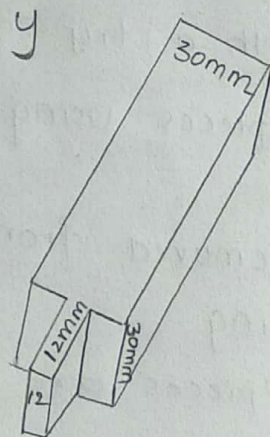
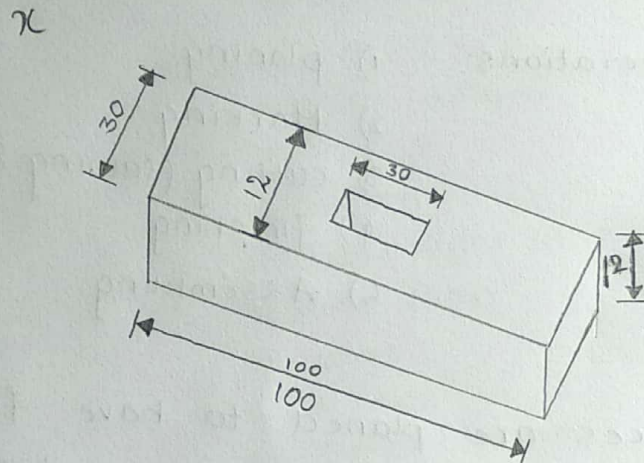
Precaution:

- 1) care should be taken while using chisels, saw etc.
- 2) planning should be done along the grains.
- 3) Tools should always be well sharpened to prevent, slip & hence injury.
- 4) while chiseling, push the chisel away from the body (you)

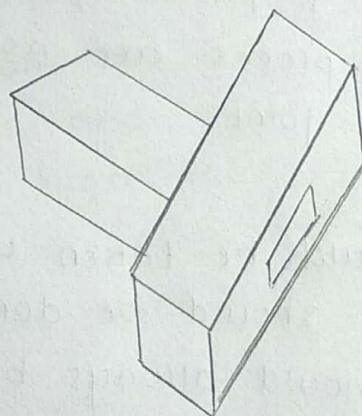


5) When thumb is used as a guide, during sawing raise it sufficiently high.

Result: The given two pieces are joined to form a MORTISE & TENON joint.



(all dimensions are in mm)





## WIRING A FLOURESCENT TUBE LIGHT

**Aim:** To prepare wiring for a flourescent tube light with switch control.

**Tools required:**

- 1) Screw driver
- 2) Hammer
- 3) pliers
- 4) line tester

**Components required:**

- 1) Switch
- 2) Tube light with fitting
- 3) joint clips
- 4) wires
- 5) screws
- 6) Switch board.

**Working Of the fluorescent tube light:**

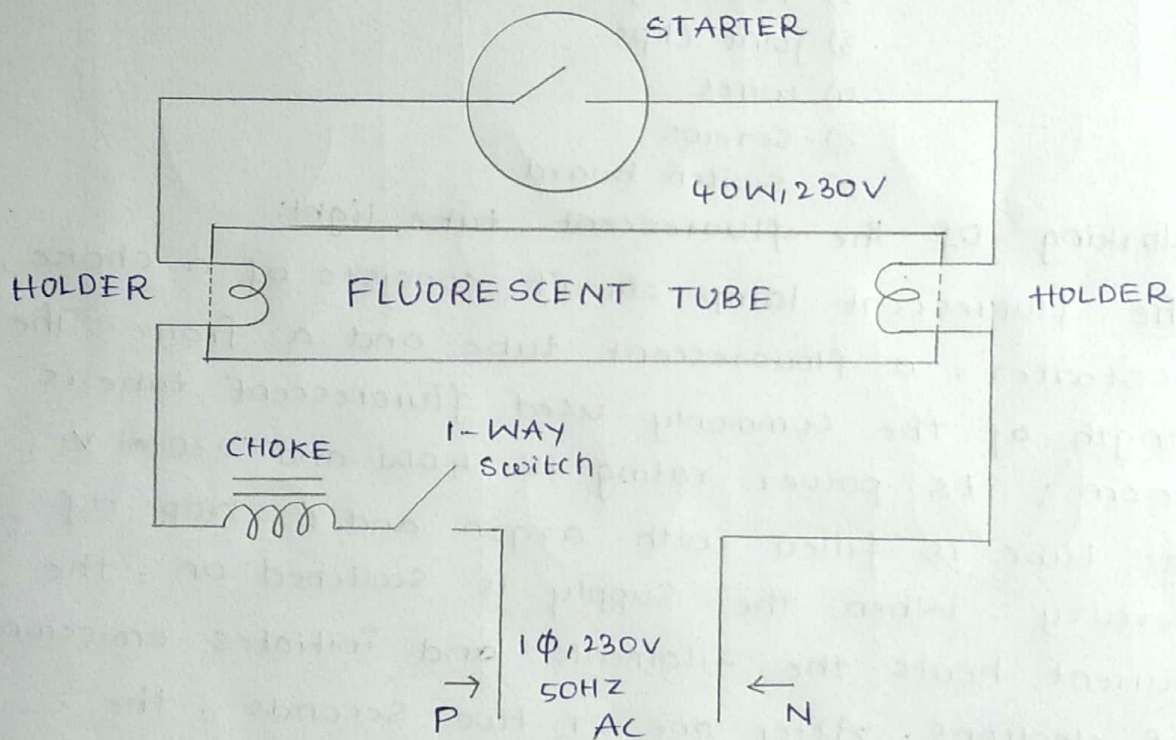
The fluorescent lamp circuit consists of a choke, a starter, a flourescent tube and a frame. The length of the commonly used flurorescent tube is 100cm; its power rating is 40W and 230V. The tube is filled with argon and a drop of mercury. When the supply is switched on, the current heats the filaments and initiates emission of electrons. After one or two seconds, the starter circuit opens and makes the choke to induce a momentary high voltage surge across the two filaments. Ionization takes place through argon and produces bright light.

**procedure:**

- 1) Mark the switch and tube light location points and draw lines for wiring on the wooden board
- 2) place wires along the lines & fix them with the help of clips.

- 3) fix the switch and tube light fitting in the marked positions.
- 4) Complete the wiring as per the wiring diagram.
- 5) Test the working of the tube light by giving electric supply to the circuit.

circuit diagram - Tube light:



Result:- The wiring for the tube light is completed and tested.