

# **ES 106 B: MANUFACTURING AND WORKSHOP PRACTICE**

Indian Institute of Technology (IIT), Gandhinagar



## **PROJECT REPORT**

Topic:

## **THE ALL ABLE TABLE**

By: Group 10613

**Sharika S<sup>1\*</sup>, Pushkar Parakh<sup>2</sup>, Alok Vidyarthi<sup>3</sup>, Shashank Ghosh<sup>4</sup>, Nishant Tatar<sup>5</sup>, Aaryan Darad<sup>6</sup>, Kaushal Kothiya<sup>7</sup>, Animesh Tumne<sup>8</sup>**

<sup>1</sup>21110194, Electrical Engineering, IIT Gandhinagar

<sup>2</sup>21110149, Chemical Engineering, IIT Gandhinagar

<sup>3</sup>21110019, Civil Engineering, IIT Gandhinagar

<sup>4</sup>21110196, Mechanical Engineering, IIT Gandhinagar

<sup>5</sup>21110223, Materials Engineering, IIT Gandhinagar

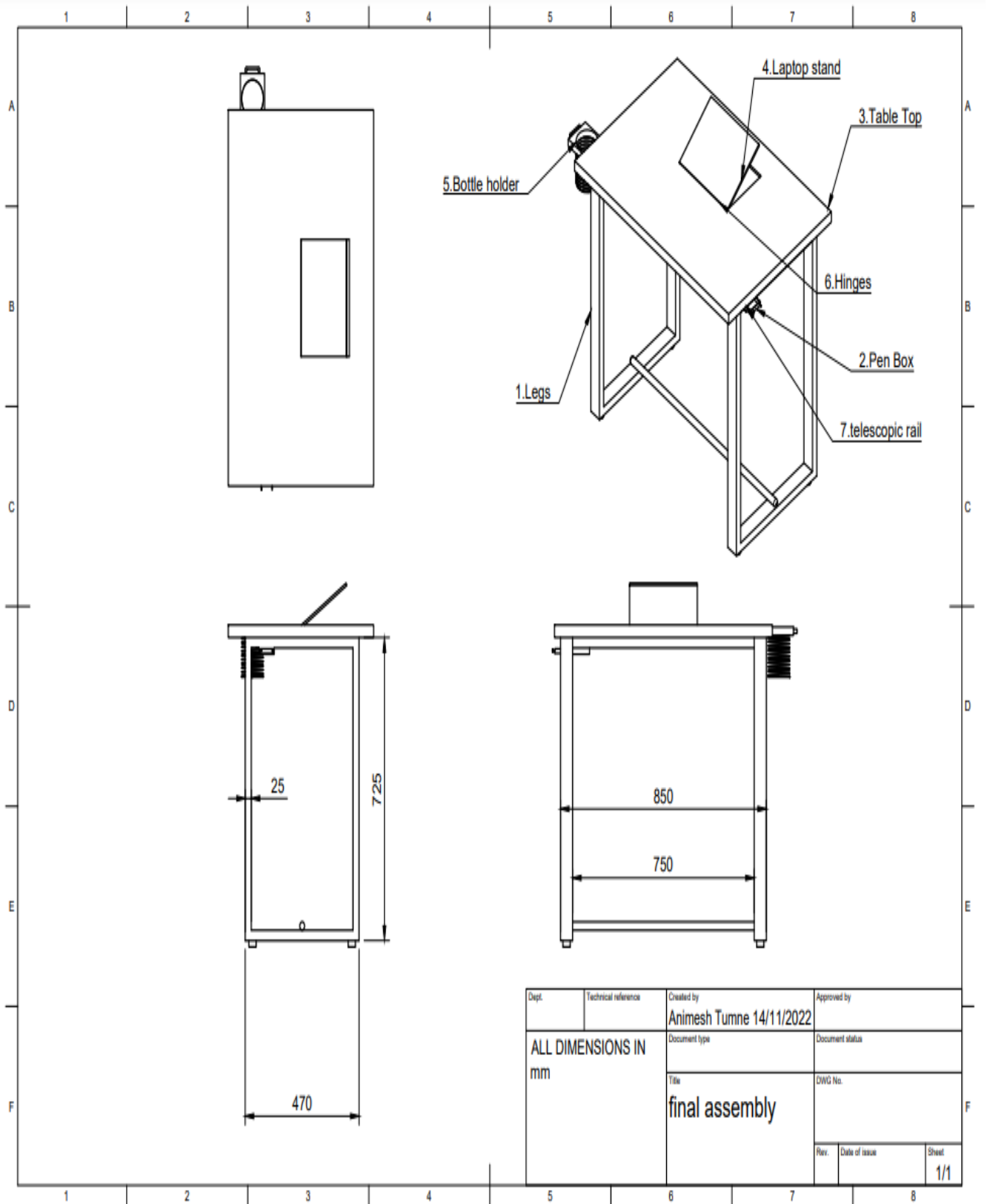
<sup>6</sup>21110001, Computer Science and Engineering, IIT Gandhinagar

<sup>7</sup>21110107, Computer Science and Engineering, IIT Gandhinagar

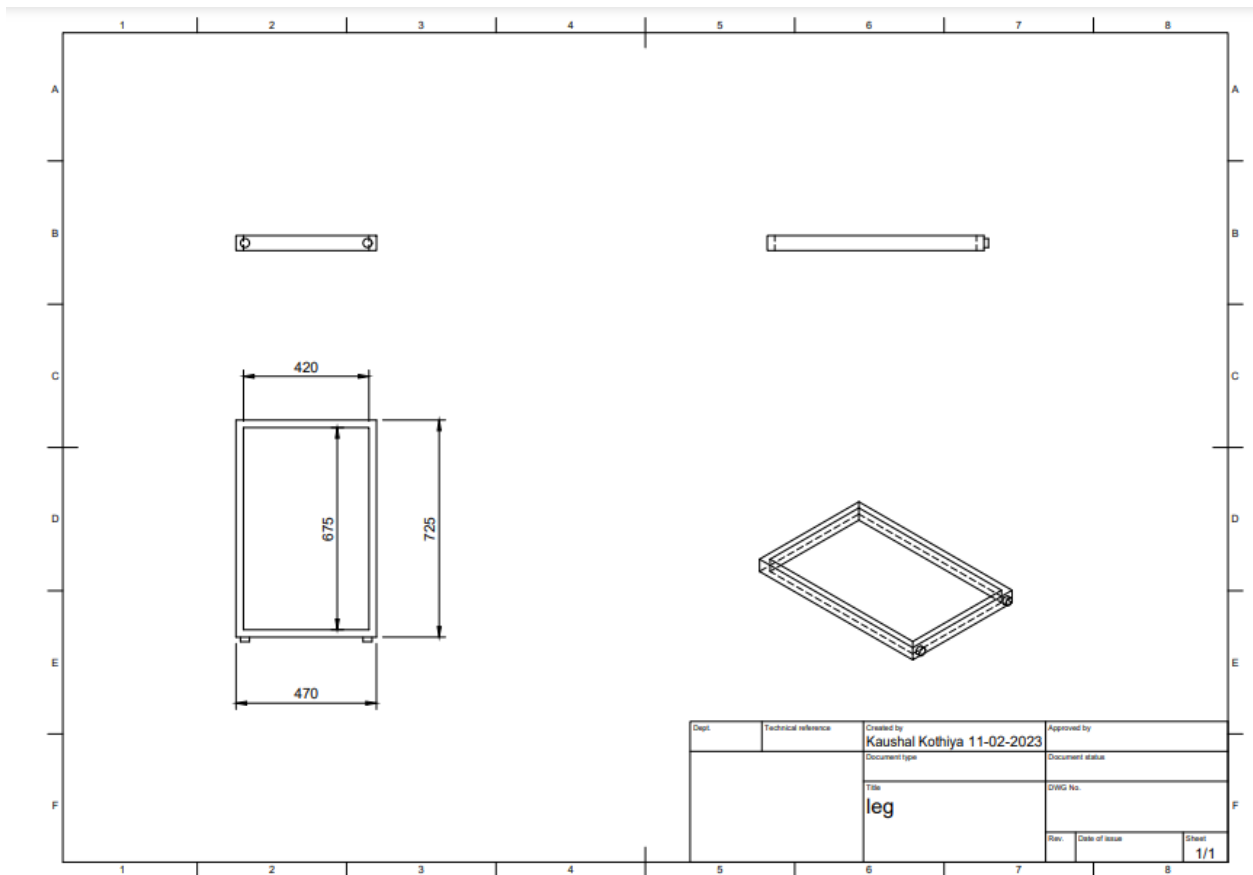
<sup>8</sup>21110227, Computer Science and Engineering, IIT Gandhinagar

\*Team Leader

## CAD MODEL OF THE FULL ASSEMBLED PRODUCT



## 1. Legs



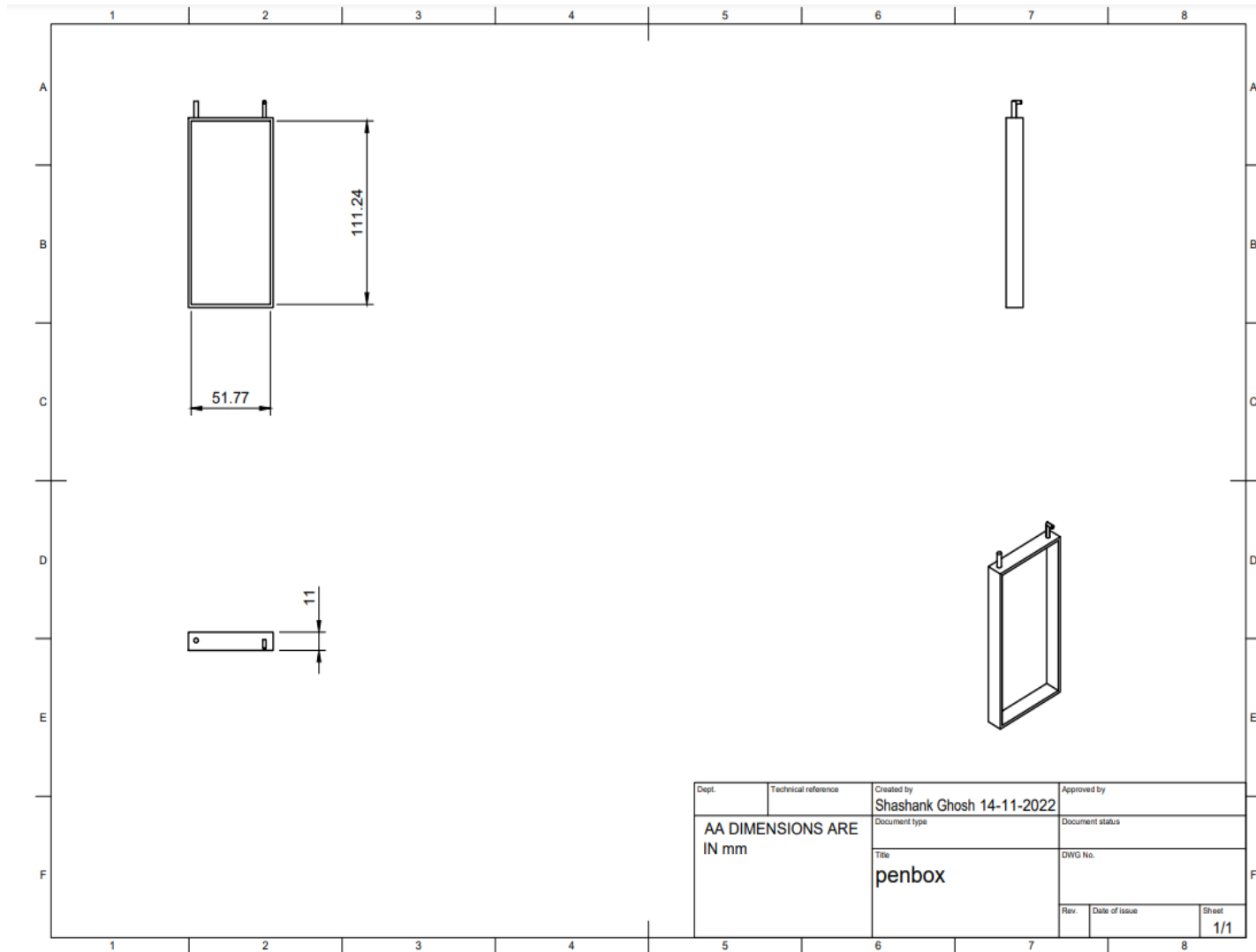
All dimensions in the picture is in mm

These represent the legs of the table, consisting of two vertically standing rectangular frames and connecting rods to connect in the middle.

Material Used - Mild steel rods

Manufacturing Processes included - welding , cutting , grinding, fitting, sanding

## 2. Pen Box

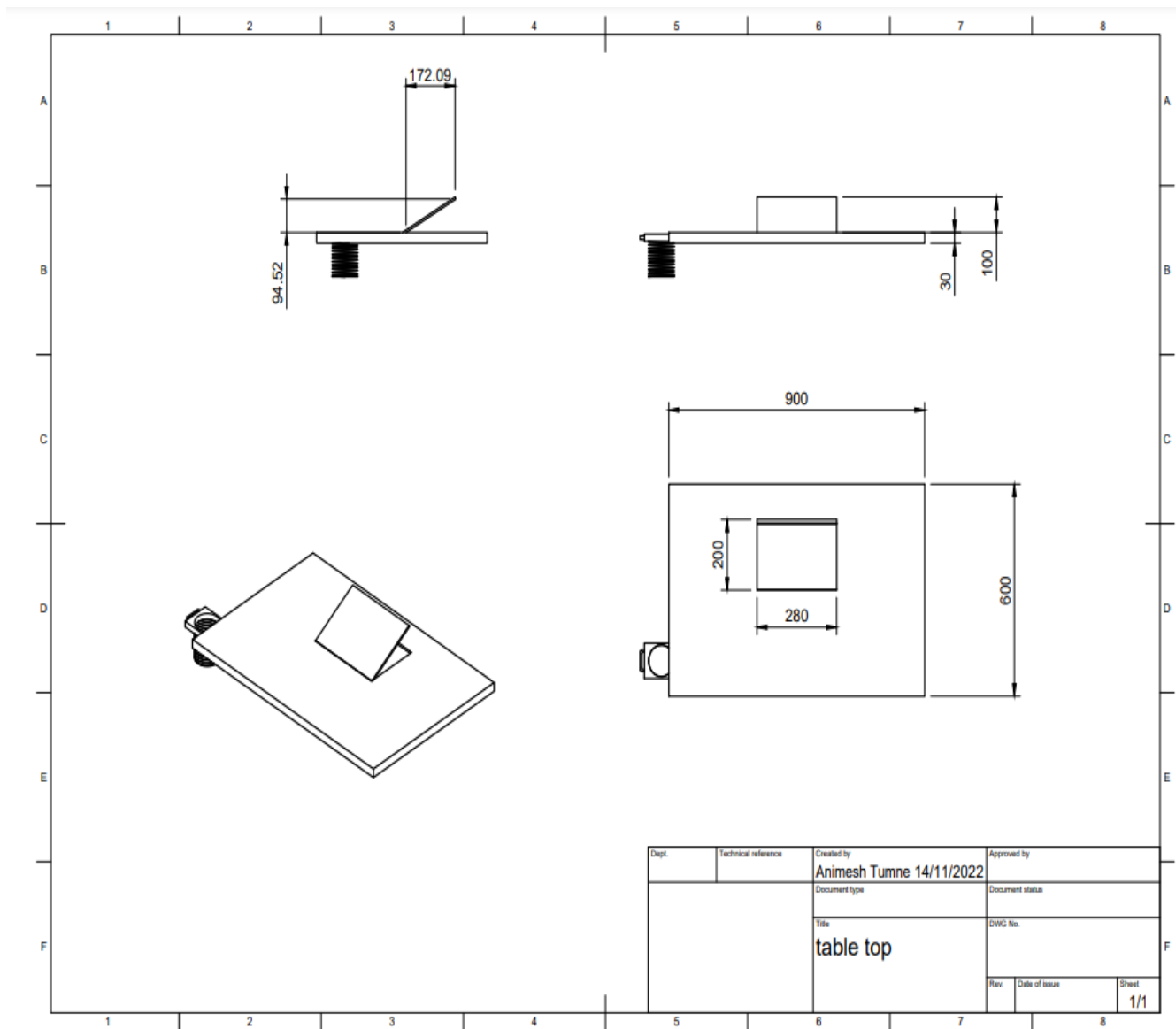


The Pen box is a slidable component that will be attached to the bottom part of the tabletop. The sliding action will be facilitated by the purchased telescopic rails.

Material used - wood

Manufacturing processes involved - Carpentry (Dimensioning, Cutting, Planing, Filing)

### 3. Table Top



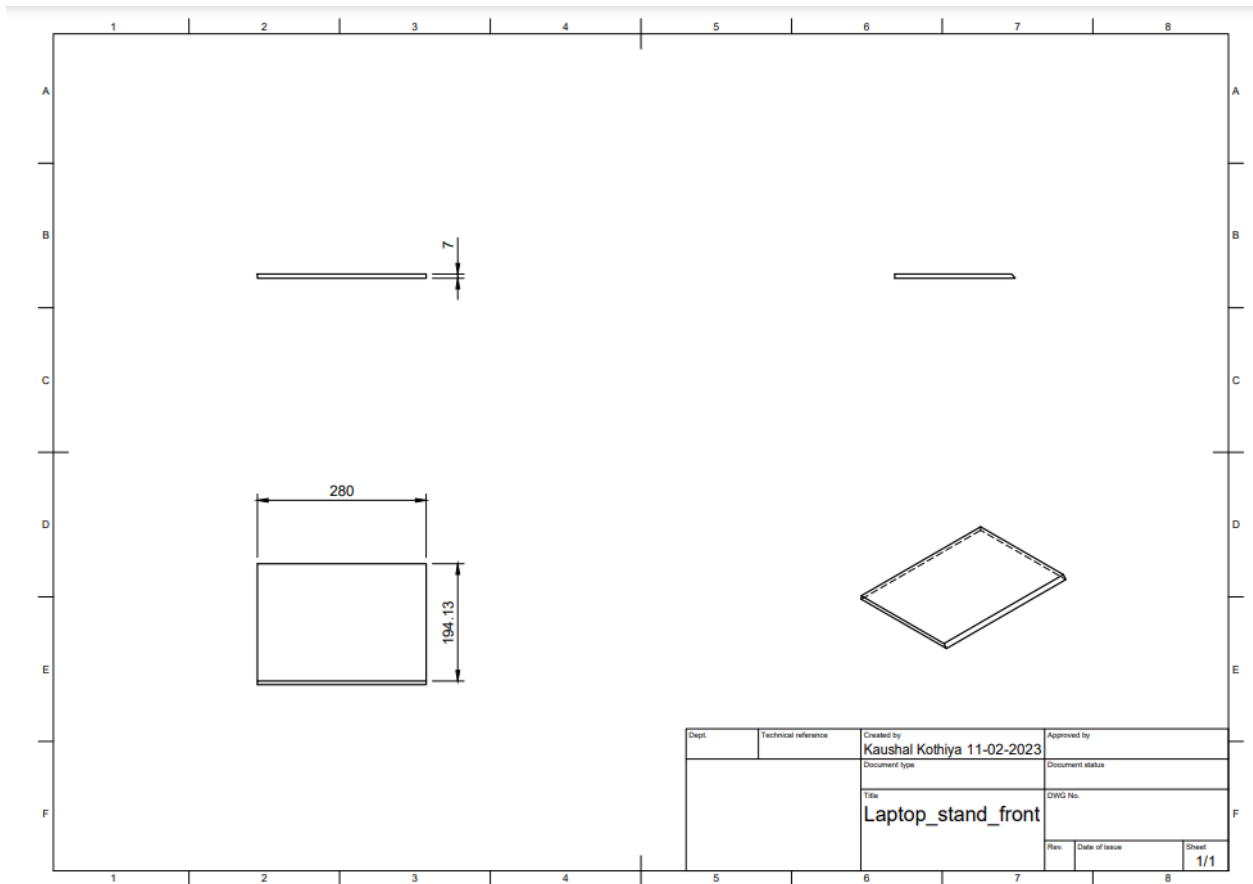
All dimensions in the picture is in mm

The tabletop is the top layer of the table where all the other parts are attached. The laptop stand is attached to the tabletop with the hinges. The bottle holder has changed and will be inserted in a hole made on the tabletop. The sides will be laminated with sun mica.

Material used: Wood

Manufacturing Processes used: Carpentry (dimensioning, cutting using machine)

#### 4. Laptop Stand



All dimensions in the picture is in mm

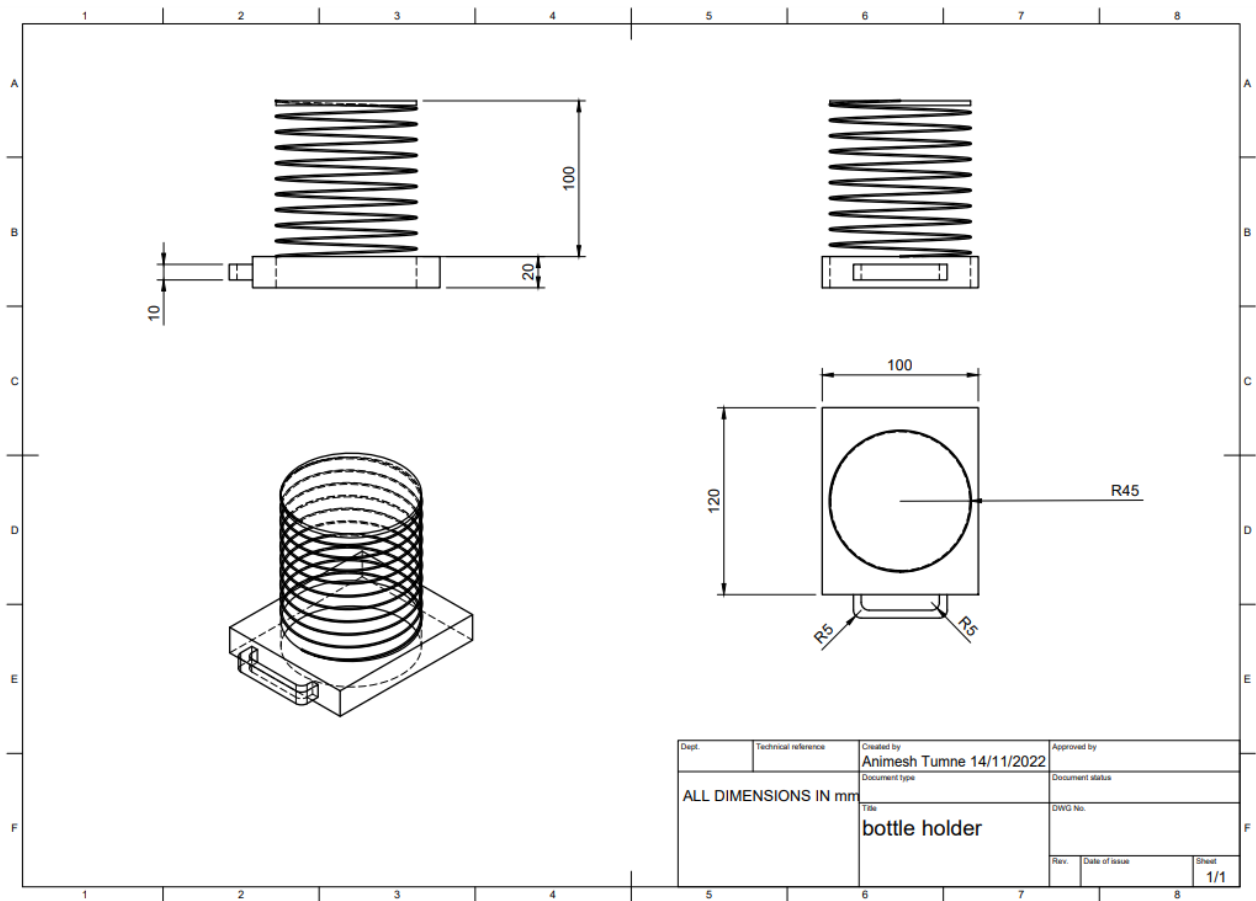
This is the laptop stand designed in the first model. The part is built by the process of laser cutting. The laptop stand will be embedded on the tabletop and attached by hinges. The height of the laptop stand can be adjusted according to the available slots. The part has undergone some changes in dimensions and logistics.

All Dimensions in mm.

Material used: MDF

Manufacturing Process: CAD modeling on Fusion 360, Laser Cutting on LaserCAD

## 5. Bottle holder



All dimensions in the picture is in mm

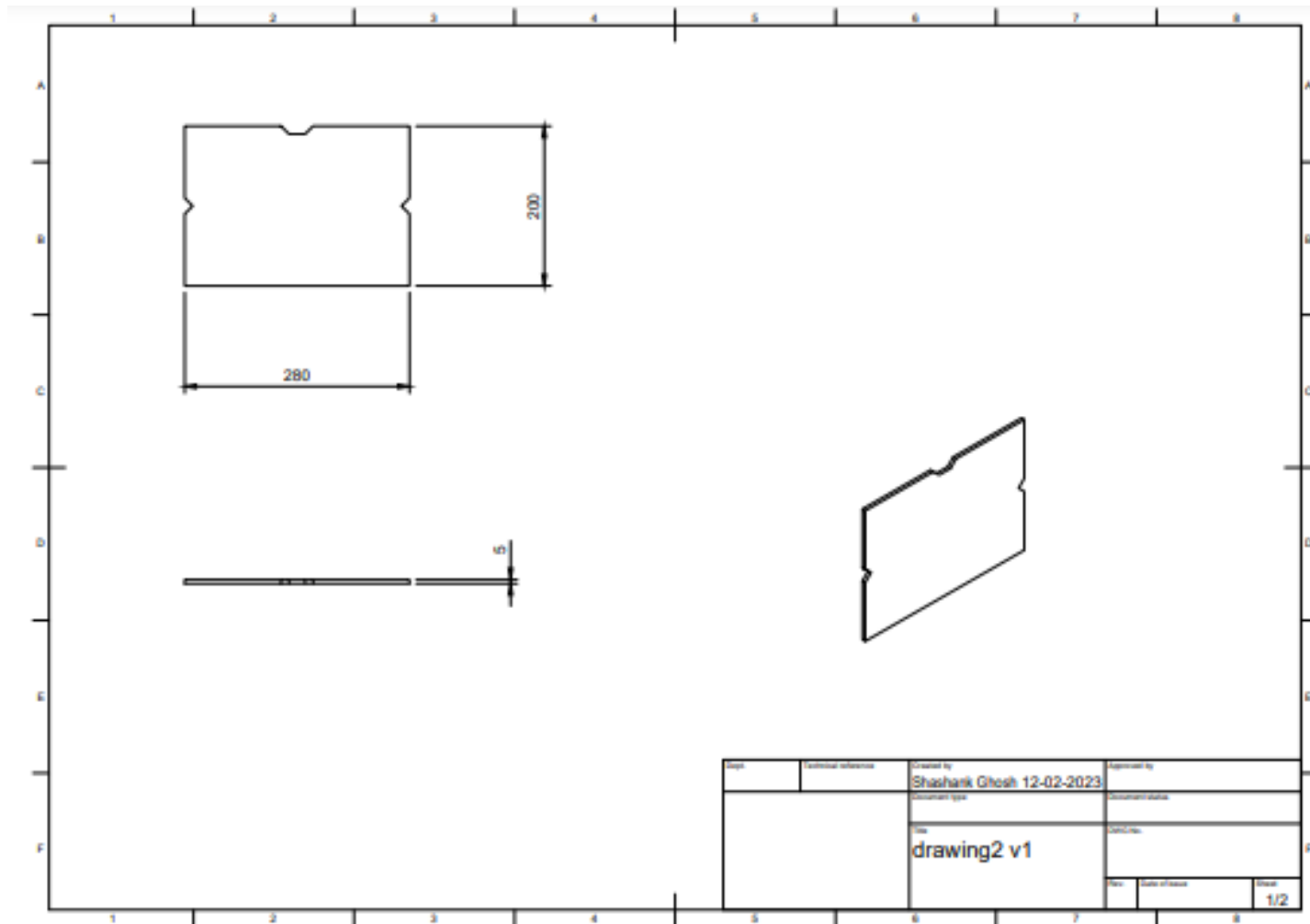
The entire part of the bottle holder is changed due to problems due to embedding and folding, and we got new ideas on brainstorming again. The bottle holder is a space specifically dedicated to a bottle for the arranged appearance of the table and easy utility. In the new model, the bottle holder will be embedded inside the tabletop.

Material used: Galvanized iron sheet

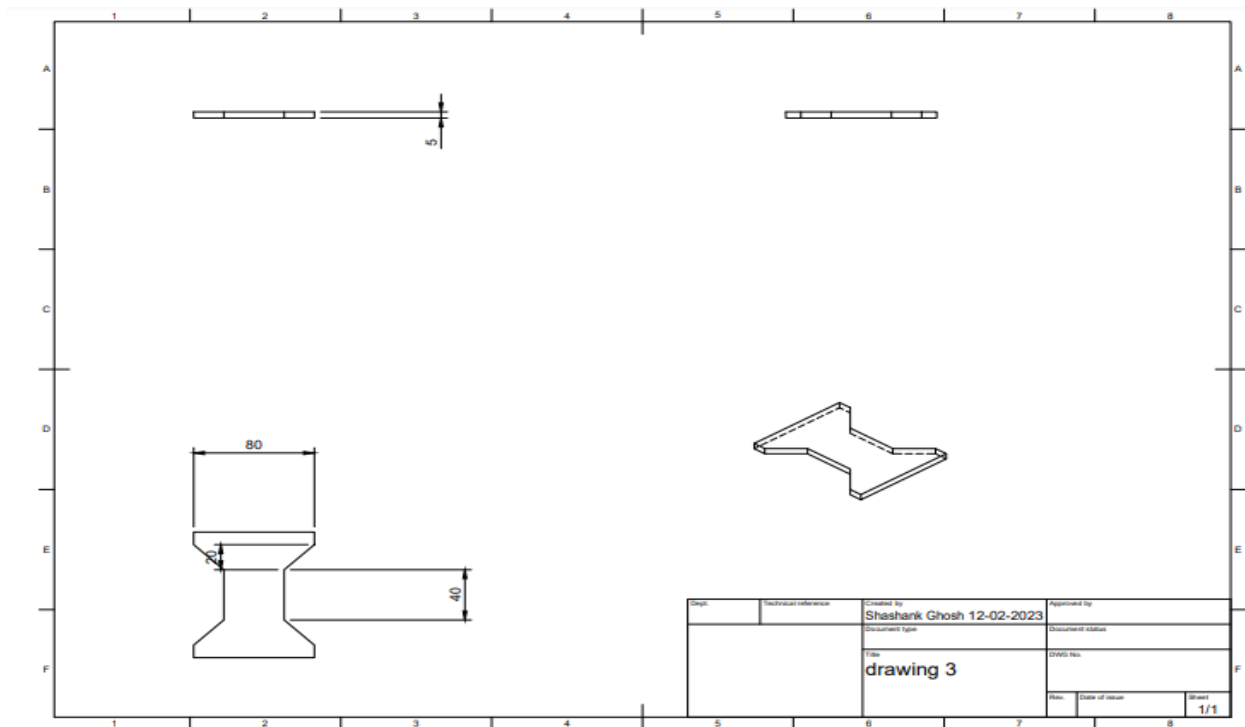
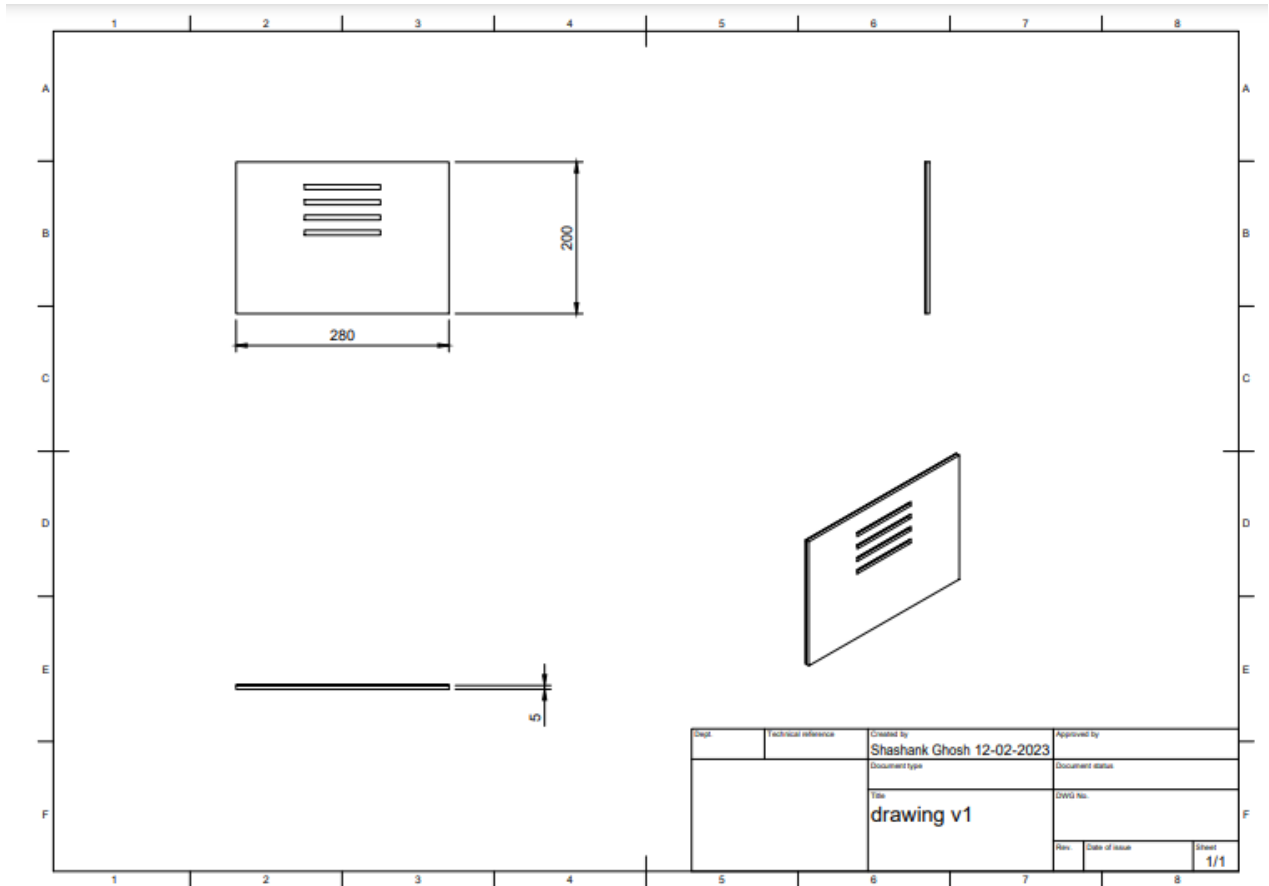
Manufacturing Process Involved: Sheet Metal Operations (dimensioning, cutting, flattening, hammering, bending)

## Drawings used for Laser cutting:

All measurements in the pictures below are in mm.







## CHANGES WE MADE

- **Bottle Holder:** The bottle holder design and logistics are changed. It is being made as a cubical holder with the dimensions of 8cm×8cm×10cm by Sheet Metal Operations. The bottle holder will be inserted on the tabletop with the major part below the table.
- **Laptop stand:** changes in the design so that it suits laser cutting and involves slidability.
- The table top thickness is changed from 3 cm to 1.7 cm as per the available wood and considering other logistics. So we are using only one ply of 1.7 cm instead of 2 plies together with 3 cm. Instead we would be attaching a small second ply under the embedded laptop stand.
- Due to Welding constraints and inaccuracies in the cutting of the metal rods, the dimensions of the leg stands have been reduced by 5-8mm

## RESPONSIBILITIES

1. Aaryan Darad - Autocad Modellings and Laser Cutting of laptop stand
2. Alok Vidyarthi - Bottle Holder by Sheet Metal Operations
3. Animesh Tumne - AutoCAD modeling and helping other tasks; deciding the dimensions and finalizing them
4. Kaushal Kothiya - Bottle holder using sheet metal operations and AutoCAD modeling
5. Pushkar Parakh - Table Top and helping in welding. Will be contributing in the making of the pen box and embedding bottle holder and laptop stand.
6. Sharika S - Table Top and helping in dimensioning tasks. Will be contributing in the making of the pen box and embedding bottle holder and laptop stand.
7. Shashank Ghosh - Welding for the leg frame and Autodesk modelings
8. Nishant Tatar - Laser Cutting of laptop stand and Welding

Component details and tentative timeline for manufacturing

S. No	Details of the Component	Timeline for Manufacturing	Trade for Manufacturing (mention if the component will be purchased directly)	Remarks by TA Workshop staff (students involved and effective time spent)
1.	Legs of the table	Project Review 1	Welding	
2.	Pen Box	Project Review 2	Carpentry	
3.	Table Top	Project Review 1	Carpentry	
4.	Laptop Stand	Project Review 2	Rapid Prototyping	
5.	Bottle Holder	Project Review 1	Sheet Metal Operations	
6.	Assembly	Project Review 2		
7.	Final demonstration	Project Review 3		