IARE
INSTITUTE OF AERONAUTICAL ENGINEERING
(An Autonomous Institute affiliated to JNTUH, Hyderabad)
Dundigal, Hyderabad - 500 043

LABORATORY WORK SHEET

Name of the Student: MADKI SAI CHARAN

Class: CSM-C Semester: I ST

Roll Number									
2	3	9	5	1	A	6	6	F	2

Course Code: AMED02 Course Name: Manufacturing Practice

Name of the Course Faculty: Mr. V. Mahidhar Reddy Faculty ID: IARE 10333

Exercise Number: 11 Week Number: 11 Date: 22 December 2023

DAY TO DAY EVALUATION:

Marks	Aim / Preparation	Algorithm / Procedure / Performance in the Lab	Source Code / Calculations and Graphs	Program Execution / Results and Error Analysis	Viva - Voce	Total
Max. Marks	4	4	4	4	4	20
Obtained	4	4	4	4	4	20

Signature of Faculty

START WRITING FROM HERE :

Objective : Preparation of acrylic gears using CNC laser engraving / Cutting machine as per drawing.

Resources : Manufacturing tools – laser engraving and cutting tools, laser engraving and cutting machine.

Materials required? Acrylic Sheets; Balsaw wooden.

Theory : Laser cutting is a type of digital manufacturing practice/technique known as "subtractive." They direct the laser beam generated on a small stone of the material. The material then melts, burns, vaporises away or is blown away by a jet of gas leaving

an edge with a good quality surface finish. The laser can cut until a 20mm-thick material, depending on type of laser.

Working Principle: The laser originates from a laser resonater, which sends out a beam of intense light that reflects through a system of mirrors to the cutting head to an extremely thin, concentrated beam.

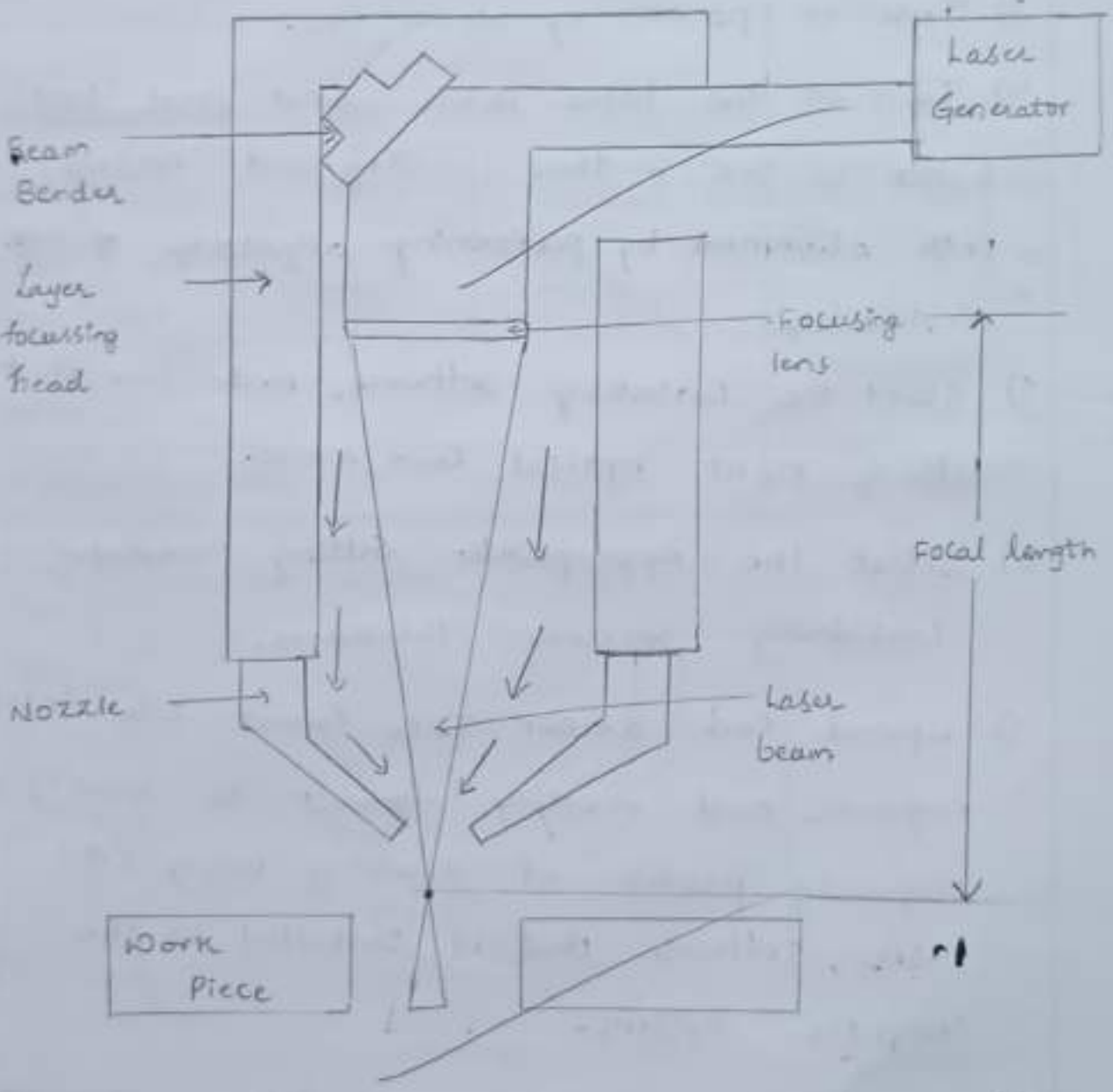
When the resonater generates lasers, mirrors guide beam in the required direction and lenses flows it at necessary points. CO_2 laser cut by a melting, vapourizing or burning action. The laser beam, which is placed at the centre of the device is oriented with mirrors on the material and cuts specimen fixed.

The setup consists of

* Machinary flat form: Composed of fittings such as machine cover, guide rail, base frame.
* optical system: drive system, laser power supply, three reflecting mirrors and one fourshead.
* Drive System: Composed of, six imported balanced of high accuracy, belt, two step motors and several gears.

* Control System : composed of high speed DSP control and two Step Motor control system : drivers.

* Accessory System : composed of circulating cooling System air blowing compressor.



ROLL NUMBER: 2395IA66F2

Procedure:

1) Start the water and air pump, let the water in laser tube circulate for 3 minutes.

2) Turn on power of principle machine.

3) Turn on power of blower fan.

4) Turn on the laser power and press 'test' button to see if there is ray and ensure ray path alignment by performing adjusting of ray verticality.

5) Start the controlling software, make sure that left & right optical can move.

6) Select the appropriate setting parameter considering specimen thickness.

7) upload cad drawn JPG format into laser engraver and modify format to specify engraving profile of drawing using CAD laser, software that is installed in the computer system.

8) Operate the transmission file in computer to start carving.

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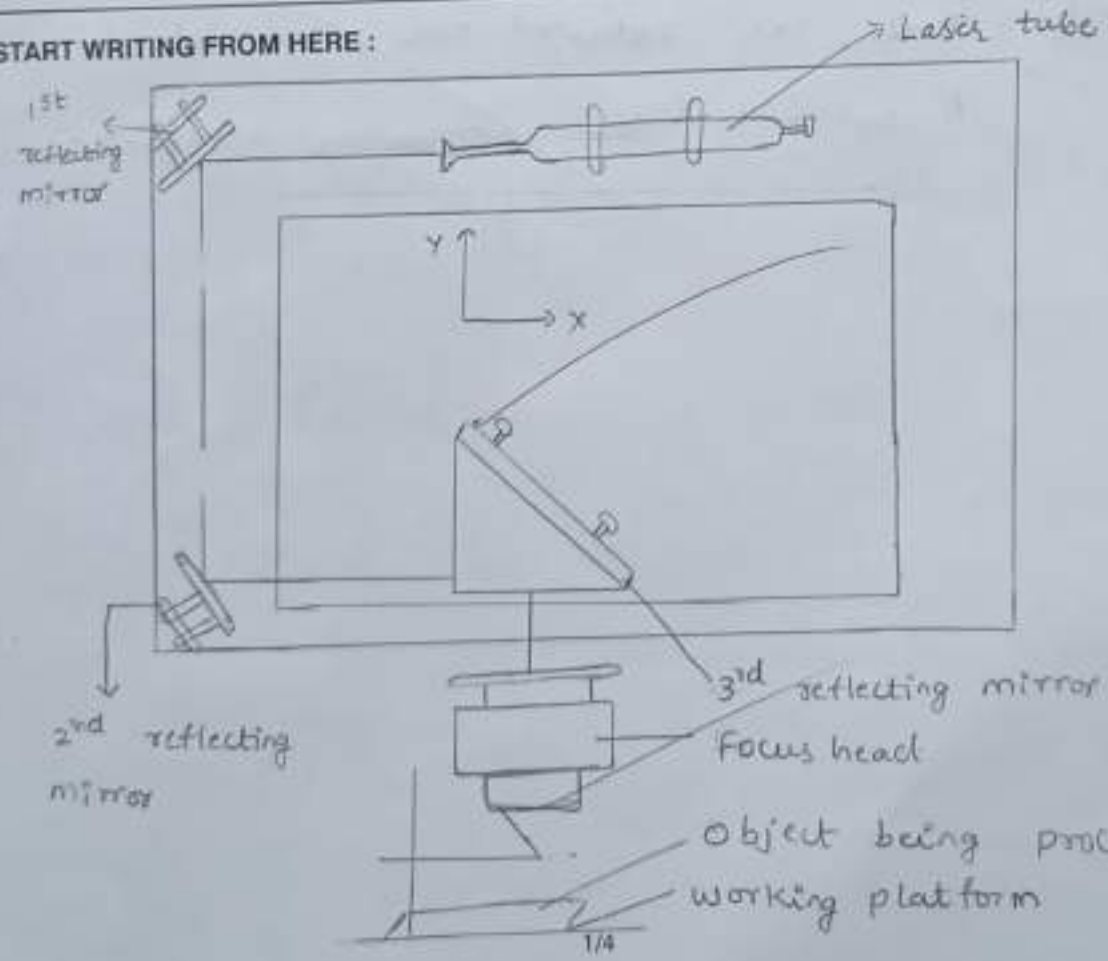

Precautions:

* Never operate System unattended.
* Properly maintain fire extinguisher.
* Keep interior of the laser cutter clean and free of debris.
* Do not put hand when laser tool is working.
* In case there is damage or fire, please turn off the power.
* Don't start the machine when there is thunder or lightening.

Result: Hence, we obtained our material (desired) through CNC laser engraving machine.

Prabhu