SPAN

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Department of Electronics

SPAN – Skill Planning and AcquisitioN Cell SPAN

CAD and 3D Printing Projects

PROJECT REPORT

Project Title : **Computer Aided Design and 3D printing of Rotary Indexing Table with four Stations actuated by electric drive**

Team Number : **10**

Team Members : 1. Sreyas Ajayyan
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3. Steve Paul
4. Abin Baiju Philip

Sem & Branch : **SEM 3, Robotics & Automation**

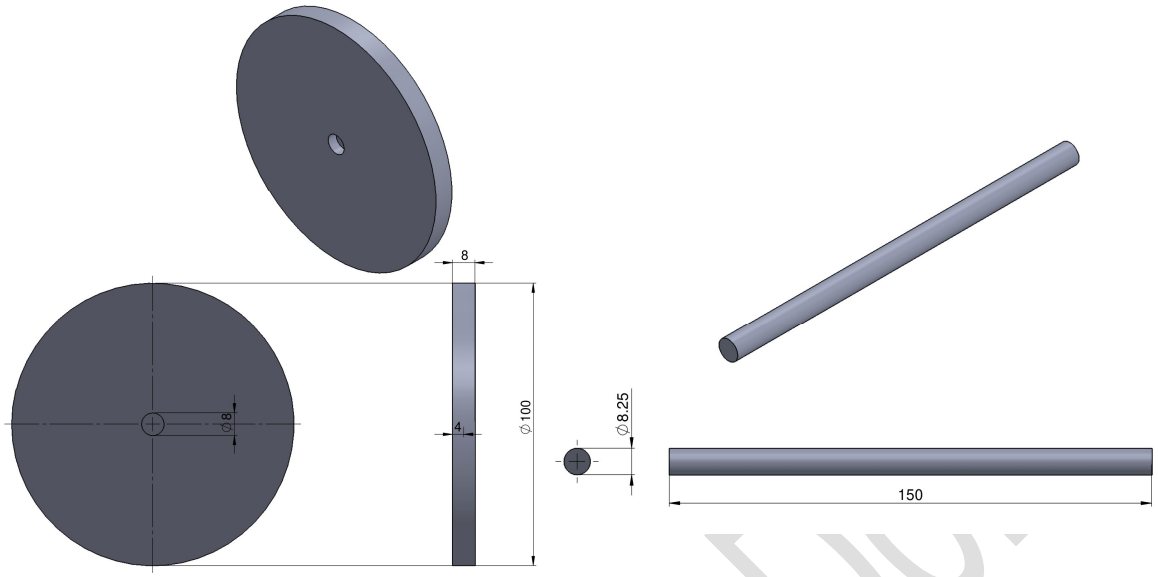
Project Summary:

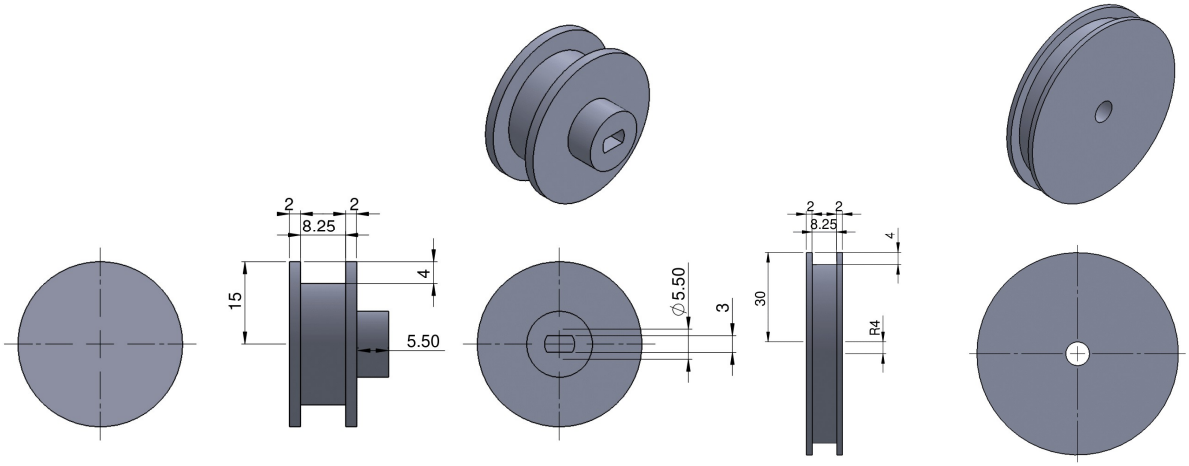
This project comprises creating a 3D-printed Rotary Indexing Table has been meticulously designed to enhance precision in manufacturing processes. The system comprises a 28BYJ-48 stepper motor, ULN2003 motor driver, belt drive, and a 682 RS bearing for optimal stability. A wooden base is used, serving as a stable platform to mount both the bearing case and the stepper motor. The mechanism involves a secondary wheel on the shaft, actuated by the belt drive system by the primary wheel attached to the stepper motor, resulting in the rotation of the shaft and subsequently driving the main table.

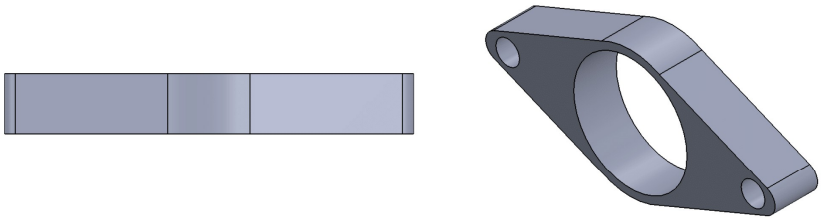
The ULN2003 motor driver plays a crucial role in facilitating the control required for the 28BYJ-48 stepper motor. Additionally, a custom-designed bearing case is made to the dimensions of the 682 RS bearing, ensuring the stability and precise functionality in the overall system.

For the movement, an Arduino code has been developed to control four sequential 90-degree rotations, with delays between each movement. This sequence optimizes the positioning of items on the table for robotic interactions during manufacturing processes of different products. The integration of a wooden base for stability, a custom bearing case, and precise control mechanisms offers a cost-effective, versatile, and reliable solution for a spectrum of manufacturing applications, emphasizing efficiency and accuracy in each rotation.

CAD Diagrams :







Arduino Code:

```
#include <Stepper.h>
const int stepsPerRevolution = 2048;
Stepper myStepper(stepsPerRevolution, 8, 10, 9, 11);
void setup()
{
  myStepper.setSpeed(10);
}
void loop()
{
  for (int i = 0; i < 4; i++)
  {
    myStepper.step(stepsPerRevolution / 4);
    delay(2000);
  }
 delay(4000);
}
```

Output **:** (Photograph/s)