

Task: Mechanical Component Analysis Using Autodesk Viewer

The task involves analyzing mechanical components provided as STL files using Autodesk Viewer and extracting engineering information from the models.

Objective of the Task

The objective of this task is to help students gain practical understanding of:

- Interpretation of 3D CAD models.
- Engineering measurements using CAD tools.
- Gear train analysis and power transmission calculations.
- Mechanical system observation and actuator estimation.

Instructions for Performing the Task

1. Use **Autodesk Viewer** to open and analyze the provided STL files.
2. Students must sign in to Autodesk Viewer using **College Domain Email ID** only**
3. Students can solve any One Question.

Question 1 – Bearing Identification

For each bearing STL model:

- Identify the type of bearing.
- Determine the dimensions required to purchase the exact bearing:
 - Inner Diameter (ID)
 - Outer Diameter (OD)
 - Width/Thickness
 - Any other relevant dimensions
- Mention the bearing designation, if applicable.

Question 2 – Mounting Hole Analysis

For each mounting component STL model:

- Determine the Pitch Circle Diameter (PCD) of the mounting holes.
- Mention:
 - Number of mounting holes
 - Hole diameter

- Method used to determine the PCD

Question 3 – Gear System Analysis

For the given gear system STL model:

- Identify the type of gears used.
- Determine the gear ratio.
- If the smaller gear has an input torque of **7 N·m**, calculate the output torque.
- Show all calculations and assumptions.

Question 4 – Worm Gear Analysis

For the provided worm gear STL model:

- Identify the type of gear mechanism.
- Determine the gear ratio.
- A motor driving the worm has:
 - Speed = **300 RPM**
 - Torque = **3 kg-cm**

Calculate:

- Output speed of the worm wheel (RPM)
- Output torque of the worm wheel (SI Units)

Also mention the special characteristics and advantages of worm gear systems.

Requirements for Submission

Task 1

Students must submit:

- PDF report containing answers to Questions 1–4.
- Relevant screenshots from Autodesk Viewer.
- Calculations and observations.

Mandatory Submission

- Screenshot showing successful login to Autodesk Viewer using the College Domain Email ID. (click on the left three horizontal lines on the left of the screen that will make your email visible, take a screenshot and submit.)