Design of Machine Elements Laboratory
End Semester examination (April, 2023)
Mechanical Engineering Department NIT Agartala

Prepare the answers of the following questions as described and submit as assignment before the viva exam on 13/14-04-2023. (Every individual must solve the problems on their own without making any group or copy)

(Your Modeling Test is on 30/31-03-2023)

1. Briefly describe your Regular Classwork and Exercises during the DOME-I Lab. (30 marks)
   (Attach completed exercises in the lab)

2. Calculate the parameters of a COTTER JOINT to support a load varying from 30 KN in compression to 30 KN in tension. The load is applied statically. Consider the following allowable stresses for the material:
   Tensile Stress = Compressive Stress = 50 MPa, Shear Stress = 35 MPa and Crushing Stress = 90MPa. (15 marks)

3. Prepare an Assembly of your designed Cotter joint (as per question no.2) using Solidworks. (10 marks)

4. Prepare a Drafting of the Assembly mentioning all the essential views and parameters using Solidworks. (10 marks)

5. Briefly Explain the procedures followed and advantages you found while solving the above questions using Solidworks software. (05 marks)

Marks Distribution for DOME-I Lab: -	
Assignment:	70
Modeling Test:	20
Viva:	10

Regular Classwork:

1. Introduction to CAD/ CAM/ CAE with Solidworks

   Exercise on 2D Drawing of Knuckle Joint Parts.

2. Concept of Constraints and utilizing constraints in Solidworks

   Exercise on using Dimensional and Geometrical Constraints on Knuckle Joint parts.

3. Conversion of 2D drawing in to 3D Model with Extrude and Revolve Commands

   Exercise on modeling parts of Knuckle Joint in Solidworks

4. Using Sweep, Hole and Thread Command in Solidworks.

   Exercise on modeling Threaded parts for Mechanical Shaft Couplings

5. Concept of Bottom-up and Top-Down Assembly in Solidworks.

   Exercise on using Assembly Constraints for Knuckle Joint Assembly using Bottom- Up approach.

6. Exercise on Modeling and Assembly of Flanged Coupling.

7. Generating Drafting in Solidworks.

   Exercise on Preparing Drafting Sheet for Knuckle Joint and Flange Coupling.