School of Computing Science and Engineering
Bachelor of Technology in Computer Science and Engineering
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem V - E2UC510T - Mechanisms Machines and Automation

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Describe a historical development in the field of mechanisms and how it influenced modern engineering. — K2 (2)

2) Describe an application where a cam-follower mechanism is commonly used and explain its function in that application. — K1 (3)

3) Discuss the concept of virtual displacements in the context of displacement analysis of mechanisms. — K2 (4)

4) Describe a scenario where a planetary gear train with an epicyclic gear is used in a real-world application, and provide a detailed analysis of its gear ratios. — K2 (6)

5) Design a four-bar linkage with specific performance requirements (e.g., desired range of motion, speed, or force output) and justify your design choices. — K3 (6)

6) Design a cam profile for a high-speed, precision application, considering factors such as follower type, motion profile, and material constraints. — K3 (9)

7) Explain the concept of virtual work and how it can be applied to analyze the equilibrium of a mechanism under external forces. — K4 (8)

8) Design a multi-stage gear train for a specific application, optimizing for power transmission efficiency and compactness. — K4 (12)

OR

Discuss the challenges and considerations in selecting materials for high-temperature applications in machine design. — K4 (12)