Name: **Enrolment No:**	

UPES

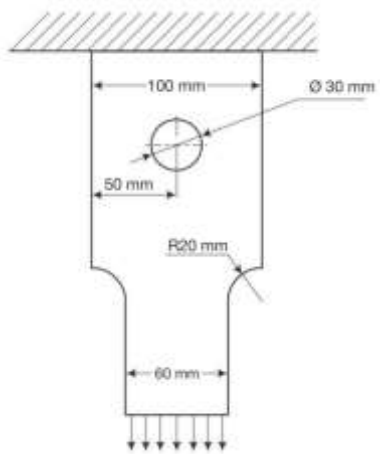
End Semester Examination, May 2024

Course: CAD and Digital Manufacturing **Semester:** VI
Program: Mechanical Engineering **Time:** 03 hrs.
Course Code: MECH 3050 **Max. Marks:** 100

Instructions: Attempt all questions. One question from section C has an internal Choice. Assume any missing data if required.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain what do you understand by the finite element model?	4	CO2
Q 2	Define the terms: nodal point, element, and degrees of freedom	4	CO1
Q 3	Explain why the computer is necessary in the use of the finite element method.	4	CO2
Q 4	Explain the functions served by a preprocessor in FEM	4	CO2
Q 5	Define Computer-integrated manufacturing and its application in modern manufacturing industry.	4	CO1
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Define Concurrent Engineering with a suitable schematic diagram and explain how it influences product design.	10	CO1
Q 7	Draw a wheel model that you think better represents the CIM concept	10	CO3
Q 8	Explain the manufacturing-process-development stage in the design process with suitable schematic diagram.	10	CO2
Q 9	(a) Identify the various challenges of CIM and discuss them in detail. (b) Identify the various Sub-Systems that comprises CIM.	6+4	CO3
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	(a) Illustrate the Concept of DM using a suitable schematic diagram. (b) Explain the concept of Digital Manufacturing idea taking control for center and Digital Manufacturing idea taking design for center	10 + 10	CO2
Q 11	(a) Discuss and develop the framework of virtual prototyping. (b) Identify the analysis stages used during the design process.	15+5	CO3

	or (a) Apply your knowledge and discuss in detail which element you will select for the given problem in FEM. After selecting the element mention the steps which you will follow to solve this problem. Assume suitable thickness.  (b) During solving of FEM problems, why tria elements are restricted to 5% & avoided in critical areas? Discuss it in detail with a suitable example. (c) Explain the guidelines for using a beam element.	**10+5+5**	