Name: **Enrolment No:**	

UPES

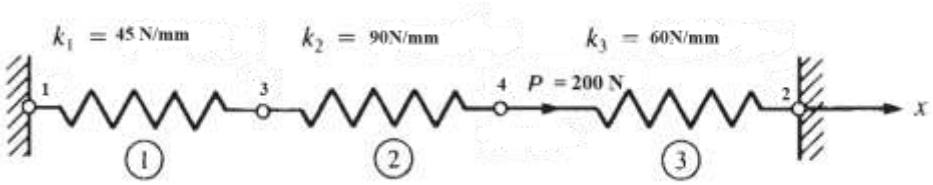
End Semester Examination, May 2024

Course: CAD/CAM **Semester:** VI
Program: Mechatronics Engineering **Time:** 03 hrs.
Course Code: MEPD 3018 **Max. Marks:** 100

Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	List out and explain basic components of a CNC system	**4**	**CO2**
Q 2	Specify the main objective of CAM	**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	Write down the advantages of numerical control over manual control	**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	(a) Schematically show the different forms of numerical control, viz., open-loop and closed-loop control systems. (b) List out Numerical Control Procedure.	**5+5**	**CO1**
Q 8	Classify NC based on Motion Control and explain them.	**10**	**CO2**
Q 9	(a) Identify the symbols under bracket which are generally used in NC programming- (N), (G), (X), (Y), (Z), (S), (F), (T), (M) (b) Identify the role of a NC programmer and list them.	**5+5**	**CO3**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	(a) Explain with an example various step in the modern design process. (b) Explain the solution methodology of Anti-Aliasing in computer graphics. (c) Explain why we carry out meshing in FEA with a suitable scheme and examples?	**7+5+8**	**CO2**

Q 11	A cube of 10-unit length has one of its corners at the origin (0, 0, 0) and the three edges along the three principal axes. If the cube is to be rotated about the Z-axis by an angle of 30° in the counterclockwise direction, calculate the new position of the cube. or For the spring assemblage shown in Figure, obtain (a) the global stiffness matrix, (b) the displacements of nodes **2** and **4**, (c) the reaction forces at nodes **1** and **2**, and (d) the forces in **spring 2**. A force of **200 N** is applied at node **4** in the x direction. The spring constants are given in the figure. Nodes **1** and **2** are fixed. 	**20 M**	**CO3**