Name: Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2023

Course: CAD/CAM **Semester:** VIII
Program: B Tech ADE **Time** : 03 hrs.
Course Code: MEPD 4001P **Max. Marks: 100**

Instructions: Attempt All

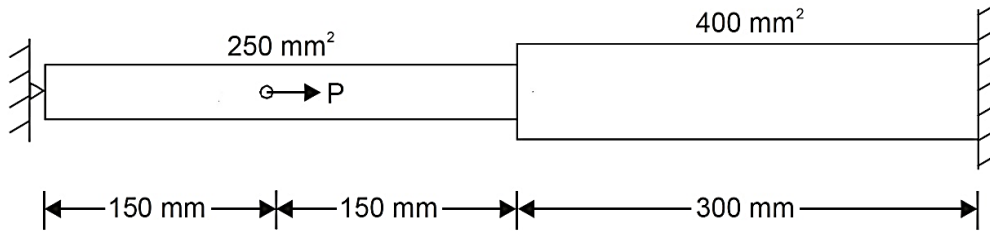| SECTION A (5Qx4M=20Marks)			
S. No.		**Marks**	**CO**
Q 1	Describe design-related tasks, which are performed by a modern computer aided design system.	**4**	**CO1**
Q 2	Discuss future trends in manufacturing.	**4**	**CO1**
Q 3	Illustrate World Coordinate System (WCS), User Coordinate System (UCS) and Screen Coordinate System (SCS) in CAD.	**4**	**CO1**
Q 4	Explain the process of assembly of element matrices as applicable in finite element modeling.	**4**	**CO1**
Q 5	A line defined by L= $\begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$ is applied the scaling factor of 2. Find the resulting line in 2 x 2 matrix form.	**4**	**CO4**
SECTION B (4Qx10M= 40 Marks)			
Q 6	A square having endpoints A (1, 1), B (6, 1), C (6, 6), and D (1, 6) is rotated by 50^0 in a clockwise direction keeping point (6, 1) fixed. Find the final coordinates.	**10**	**CO2**
Q 7	Derive Bresenhem's algorithms for the linear interpolation for graphic terminals.	**10**	**CO2**
Q 8	Explain the concept of the three basic Boolean operations used in solid modeling. Draw neat sketches showing the effect of these operators on any two basic primitives.	**10**	**CO3**
Q 9	Explain manufacturing cell and list the criteria considered when designing a manufacturing cell.	**10**	**CO4**

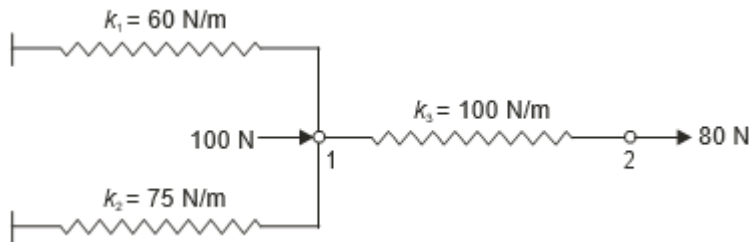## SECTION-C
(2Qx20M=40 Marks)

Q 10	Determine the nodal displacement, element stresses, and support reactions of the axially loaded bar as shown in Figure. Take, E = 200 GPa and P = 30 kN 400 mm² 250 mm² ○→ P ←150 mm→←150 mm→←300 mm→ **OR** Determine the displacements of nodes 1 and 2 in the spring system shown in Fig. k_1 = 60 N/m k_3 = 100 N/m 100 N → 1 → 80 N 2 k_2 = 75 N/m	20	CO3
Q 11	A) Compare various coding systems used in Group Technology. B) Apply the rank order clustering technique to the part-machine incidence matrix in the following table. Parts 	Machines	A	B	C	D	E	F	G	H	I
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1	1			1				1	
2					1			1	
3			1		1			1	
4		1				1			
5	1							1	
6			1					1	
7		1				1	1				20	CO5