Name: **Enrolment No:**	UPES

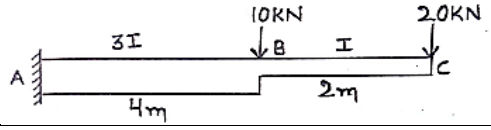
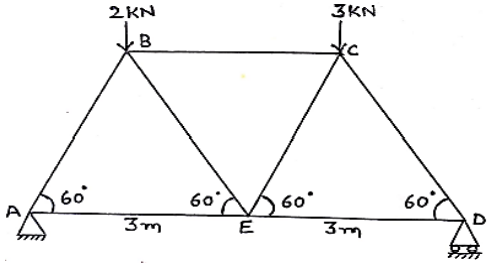
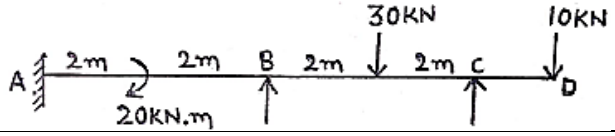
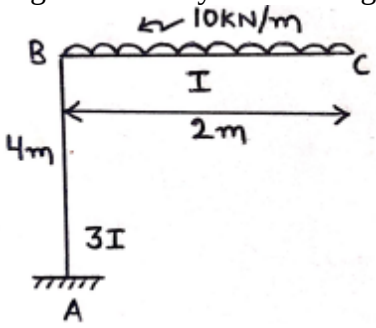
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

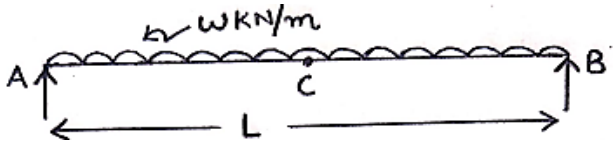
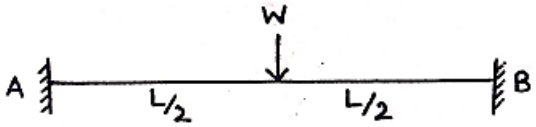
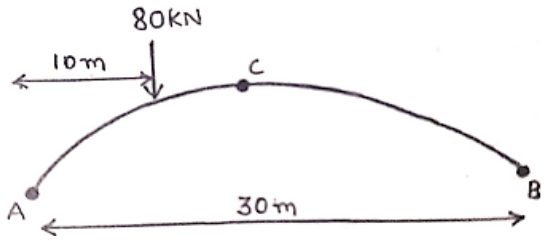
Course: Mechanics of Materials **Semester: V**
Program: B. Tech (Civil Engineering) **Course Code: MECH 3025**
Max. Marks: 100 **Time: 03 hrs.**

SECTION A

S. No.		Marks	CO
Q.1	Differentiate between determinate & unstable structure with example	**4**	**CO1**
Q.2	What are perfect & Imperfect truss with examples	**4**	**CO2**
Q.3	Explain the concept of three-moment theorem with example.	**4**	**CO3**
Q.4	Explain the difference between Cable & Arch action	**4**	**CO4**
Q.5	Briefly describe the procedure for determining trusses	**4**	**CO2**

SECTION B

Q.6	Analyze the beam shown in figure below by Conjugate beam method. Take E = 150Gpa & I = 5.50 X 107mm^4 Draw B.M.D 	**10**	**CO1**
Q.7	Analyze the frame shown in figure below by method of Joints. 	**10**	**CO2**
Q.8	Analyze the continuous beam with settlement of supports. The suport C settles by 8mm. Take EI = 20000kN.m^2.Use three-moment theorem 	**10**	**CO3**
Q.9	Analyze the beam shown in figure below by Strain energy method. 	**10**	**CO1**

	OR  		
SECTION-C			
Q.10	Analyze the fixed beam shown in figure below & draw BMD & SFD  	**20**	**CO3**
Q.11	Analyze the three-hinged arch Shown in Figure of span 30m & rise 5m. Draw B.M.D, Normal thrust & Radial Shear at 12m from left hinge.  **OR** A two-hinged parabolic arch of span L & rise "r" carries a UDL of w/meter run over the left hand half of span. The MOI of the arch rib varies as the secant of the slope of rib axis. a. Obtain the expression of horizontal thrust H. b. Calculate the horizontal thrust and bending moment at quarter span point on the right half of the span if L= 20m, r = 4m, and w =20kN/m	**20** **20**	**CO4**