

Name:  
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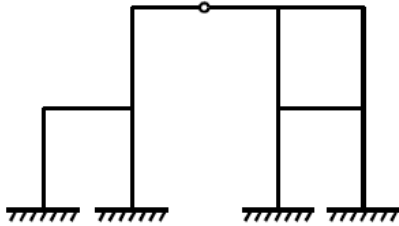
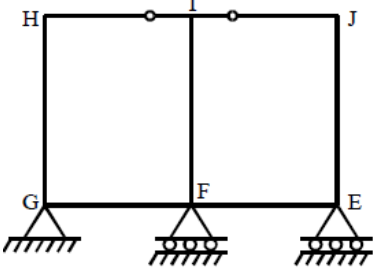
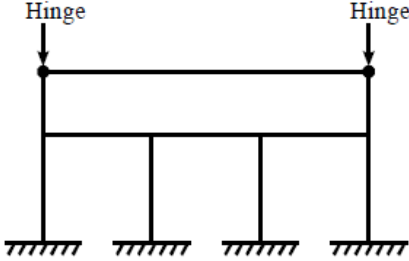
**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, December 2022**

**Course:** Structural Engineering  
**Program:** B.Tech. Civil Engineering  
**Course Code:** CIVL 3059

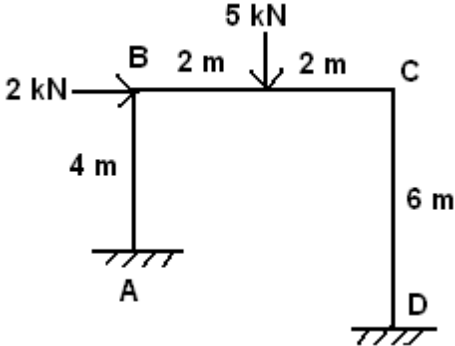
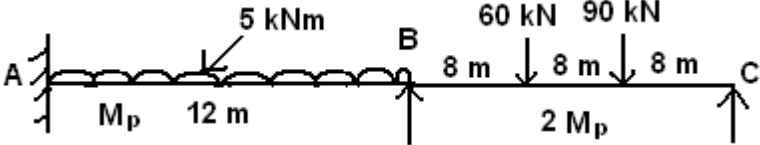
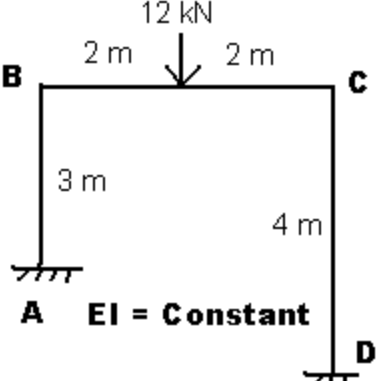
**Semester :** V  
**Time :** 03 hrs.  
**Max. Marks:** 100

**Instructions:**

**SECTION A**

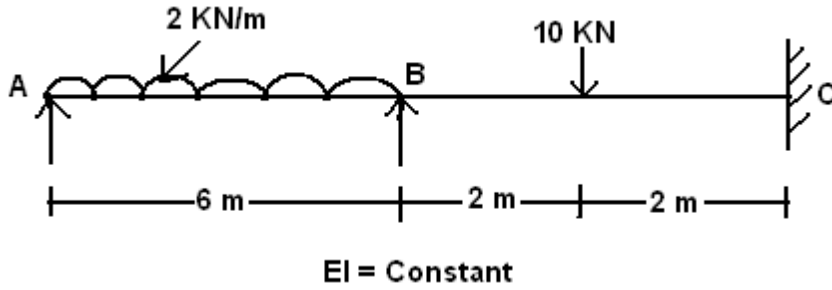
S. No.		Marks	CO
Q 1	<p>A What is meant by displacement method in structural analysis?</p> <p>B What is the static indeterminacy for the frame shown below?</p>  <p>C The degree of static indeterminacy of the rigid frame having two internal hinges as shown in the figure below, is</p>  <p>D The total degree of indeterminacy (both internal and external) for the frame shown in the given figure is</p>  <p>E What are the assumptions made in the analysis of rigid frames?</p>	5 x 4 = 20	CO1

**SECTION B**

<p>Q 2</p>	<p>Find the fully plastic moment required for the frame shown in figure, if all the members have same value of <math>M_p</math>.</p> 	<p align="center">10</p>	<p align="center">CO4</p>
<p>Q 3</p>	<p>A continuous beam ABC is loaded as shown in figure. Determine the required MP if the load factor is 3.2.</p> 	<p align="center">10</p>	<p align="center">CO4</p>
<p>Q 4</p>	<p>A continuous beam ABC consists of spans AB and BC of 5 m length in each. Both ends of the beam are fixed. The span AB carries a point load of 15 kN at its middle point. The span BC carries a point load of 25 kN at its middle point. Find the moments and reactions at the supports. Assume the beam is of uniform section. Use slope deflection method.</p>	<p align="center">10</p>	<p align="center">CO2</p>
<p>Q 5</p>	<p>Analyze the portal frame ABCD shown in figure by moment distribution method.</p> 	<p align="center">10</p>	<p align="center">CO2</p>

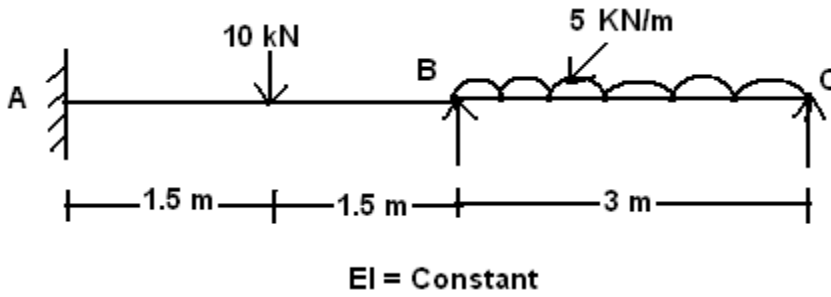
**SECTION-C**

<p>Q 6</p>	<p>Analyze the continuous beam shown in figure using flexibility method.</p>	<p align="center">20</p>	<p align="center">CO3</p>
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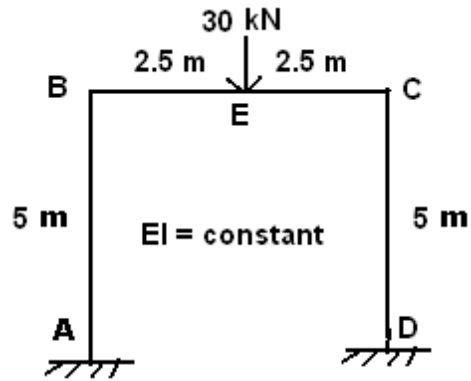
Q 7

Analyze the continuous beam shown in figure using stiffness matrix method.



OR

Analyze the portal frame ABCD shown in the figure by stiffness method and draw the bending moment diagram.



20

CO3