BACHELOR OF ENGINEERING (CIVIL ENGINEERING) THIRD YEAR SECOND SEMESTER EXAM 2022

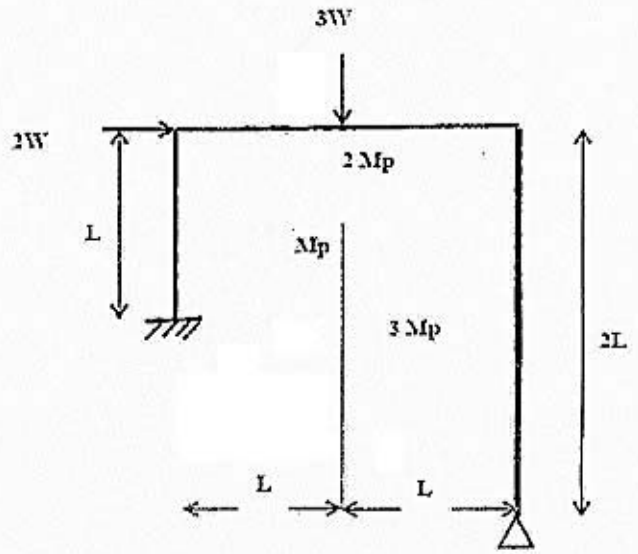
Theory of Structures-III

PART-I

Time: Three Hours | Full Marks 100 (50 marks for each part)

Use a separate Answer-Script for each part

[No code or handbook is allowed]

No. of questions	Part I (Answer Any Two of the following questions.)	Marks (2X25=50)
1	A suspension cable of 100 meters horizontal span and central dip 6 m has a stiffening girder hinged at both ends. The load transmitted to the cable including its own weight is 2500 kN. The girder carries live load 20 kN/m UDL over the left quarter of the span. Assuming the girder to be rigid, calculate the shear force, bending moment in the girder at 15 m from the left support. Also calculate the maximum tension in the cable.	10
2	A suspension bridge is of 120 m span. The cable of the bridge has a dip of 12 m. The cable is stiffened by a girder with hinges at either end and at centre. The dead load of the girder is 15 kN/m. A single concentrated load of 300 kN passes through it. i) What is the value of maximum horizontal pull? ii) What will be the maximum load intensity (w) of load transmitted to the cable? iii) What will be the maximum bending moment at 12 m from left end? iv) Find the greatest positive and negative bending moment of the girder when Also find the maximum tension in the cable.	15
2 (a)	Define lower bound theorem and upper bound theorem.	7
(b)	Find the collapse load for the following portal frame. 	18

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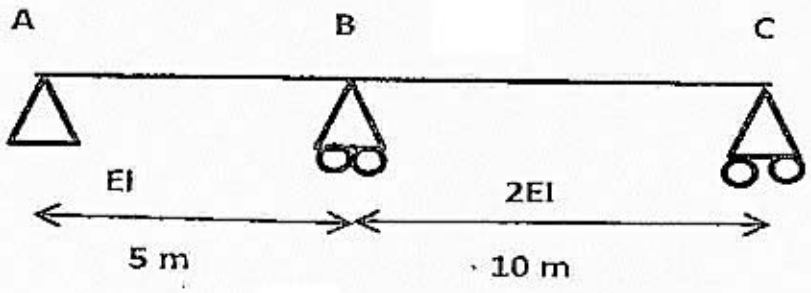
No. of questions	Part I (Answer Any Two of the following questions.)	Marks (2X25=50)
3 (a)	Find the maximum value of **BMD** at midpoint of BC of the beam ABC, if 10 kN/m UDL of length 30m load passes over ABC. The beam is made of M30 grade of concrete. I=0.0864 m^4. 	20
(b)	State and explain Mulller-Breslau's principle.	5

Ex/CE/5/T/306/2022

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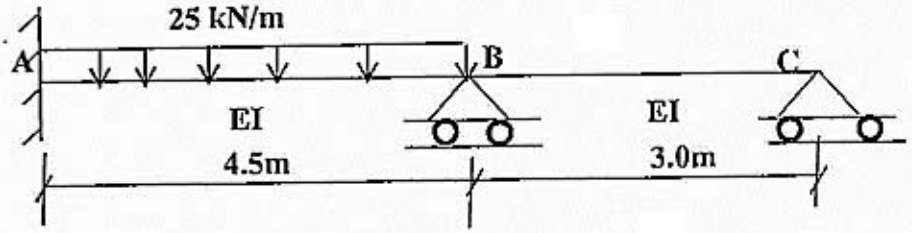
Subject: THEORY OF STRUCTURES-III

Full Marks:100 **Time: 3hours**

(Use Separate Answer scripts for each Part)

Part- II (Marks 50)

1. Find member reactions and support reactions of the given beam shown below. **Use Flexibility method (member approach).** **25**



2. Analyse the truss shown below. All members have same "*A*" and "*E*". **Use Stiffness method.** **25**