Name of the Examination: B.E. CIVIL ENGINEERING SECOND YEAR SECOND SEMESTER - 2024

Subject : STRUCTURAL MECHANICS II

Use separate answer script for each Part
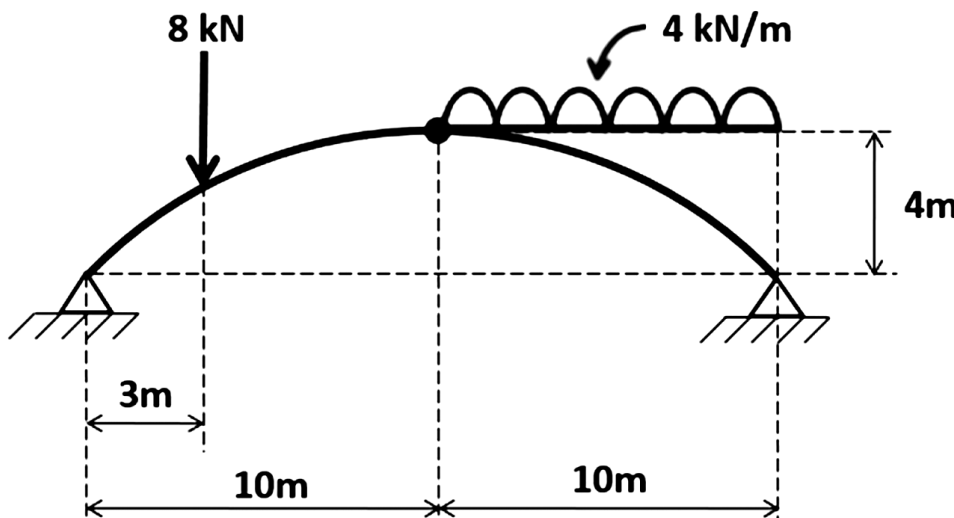
Time : Three hours   **PART I   (60 Marks)**   Full Marks:100

Instructions:	
I	All notations represent their standard relevant meaning.
II	If you feel that any data or condition is/are missing in any question, please assume relevant inputs and mention the same.

Sl No	Question	Marks	CO
1	A cantilever beam of uniform cross-section of 6m in length is subjected to a hogging moment of 20 kN-m at its free end. Consider the material of the beam as linearly elastic. The flexural rigidity of the beam is EI. (a) Determine deflection at the free end using Strain Energy in terms of EI. (12 marks) (b) Determine the slope at the free end using the Unit Load method. (8 marks)	20	CO 3
2	A 3-hinged stiffening girder of a suspension bridge of span 150m is subjected to uniformly distributed load of 30 kN/m at the right half of the span. Find Shear Force and bending Moment for the girder at a distance of 40m from the left end and 40m from the right end. The central dip of the supporting cable is 10m.	20	CO 4
3	 Figure: 03 (No Scale) Consider the 3-hinged arch from Figure: 03 and (a) Draw Influence Line Diagrams for vertical support reactions and horizontal thrust of the arch. (10 marks) (b) Calculate vertical support reactions and horizontal thrust of the arch using respective influence line diagrams. (10 marks)	20	CO 4

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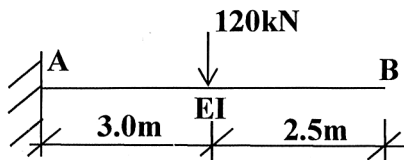Full Marks:100   Time: 3hours

(Use Separate Answer scripts for each Part)

Part- II (Marks 40)

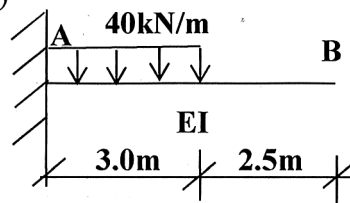1. Find slope and deflection at point B of the structures shown below.

   a)   b)   (7+8)

2. Determine the bending moment at different locations of the continuous beam shown below. Also draw the bending moment and shear force diagrams. Use **Three moments theorem.**   (25)