C   Reg. No. : ☐☐☐☐☐☐☐☐☐☐

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Sixth Semester

Civil Engineering

15UCE601- STRUCTURAL ANALYSIS – II

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Shape factor of square section is   CO1- R

    (a) 1.0   (b) 1.5   (c) 2.0   (d) 2.5

2. Static interminacy value of a continuous beam ABC, fixed at A and hinged at   CO2- R
    B and C is
    (a) 1   (b) 2   (c) 3   (d) 4

3. Flexibility matrix method is known as   CO3- R

    (a) Force method   (b) Displacement method

    (c) Equilibrium method   (d) Graphical method

4. A triangular plane stress element has _____degree's of freedom.   CO4- R

    (a) 3   (b) 4   (c) 5   (d) 6

5. One practical application of curved beam is   CO5- R

    (a) Circular tanks   (b) Industrial buildings   (c) Bridges   (d) Arches

PART – B (5 x 3= 15 Marks)

6. State upper and lower bound theorems.   CO1- R

7. Compare static indeterminacy and kinematic indeterminacy.   CO2- R

8. A continuous beam ABC is fixed at A and hinged at B and C. No loads are   CO3- R
    acting over the beam. Draw its possible primary structures.

9. Mention applications of finite element analysis in civil engineering.   CO4- R

10. Draw the profile of a suspension bridge and mark its salient components.   CO5- R

<div align="center">PART – C (5 x 16= 80 Marks)</div>

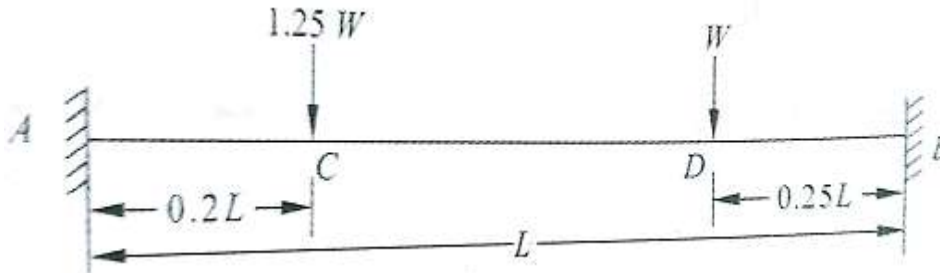11. (a) Determine the collapse load of the beam shown in Figure 1.   CO1- App   (16)

<div align="center">Figure 1
Or</div>

(b) Collapse loads acting on the frame ABCD is shown in Figure 2. CO1- App   (16)
Determine the maximum plastic moment capacity of the section.
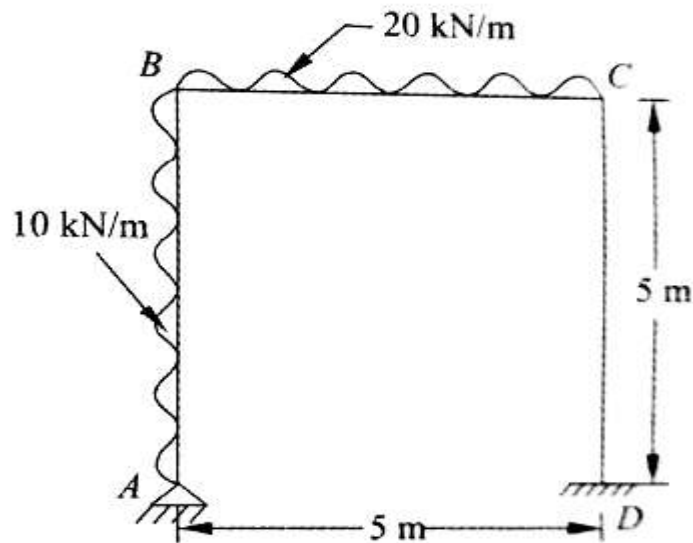

<div align="center">Figure 2</div>

12. (a) Analyse the continuous beam shown in fig 3. By stiffness matrix CO2- Ana   (16)
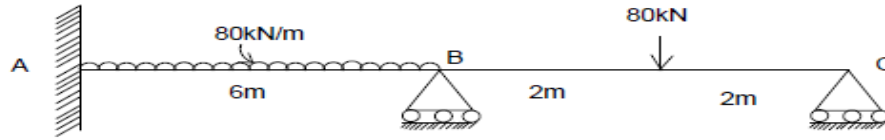method. EI is constant.

Figure 3
Or

(b) Analyse the frame ABCD shown in figure 4 using stiffness matrix CO2- Ana   (16)
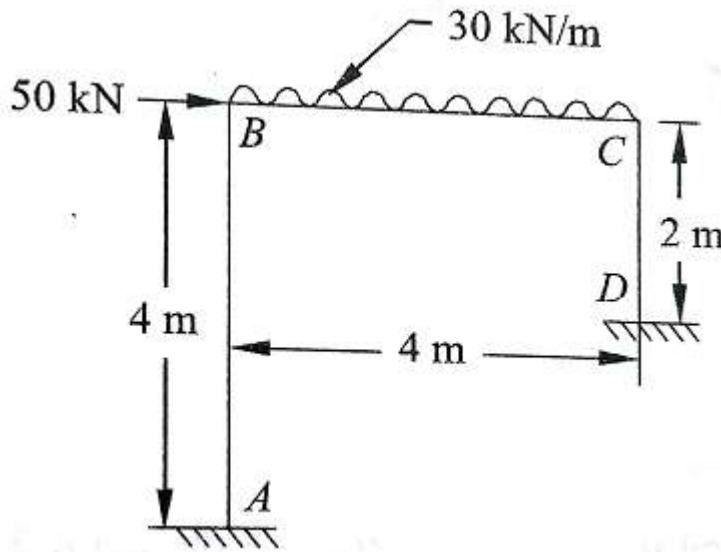method.

Figure 4

13. (a) Analyze the continuous beam ABC using flexibility matrix method CO3- Ana   (16)
where support A is fixed and B and C are over rollers. Span
AB = 4 m and BC = 3 m. AB is loaded with a UDL of 60 kN/m and
BC is loaded with a central point load of 100 kN.

Or

(b) Analyze the portal frame ABCD shown in figure 4 using flexibility CO3- Ana   (16)
method. Take EI = constant.

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14. (a) List out the significance of finite element method with its merits and demerits.   CO4- U   (16)

<div align="center">Or</div>

(b) Explain the step by step procedure of analyzing a beam using finite element method.   CO4- U   (16)

15. (a) A suspension cable of span 16 m is supported over columns of equal height. Length of the cable is 18 m and it is loaded with a UDL of 1 kN/m. Determine the reactions developed at supports and maximum dip in the cable.   CO5- U   (16)

<div align="center">Or</div>

(b) Write the step by step procedure for analysis of space truss using tension coefficients method.   CO5- U   (16)

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