Q.P. Code: 16CE125 **R16**

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year II Semester Regular Examinations May 2019

STRUCTURAL ANALYSIS-II

(Civil Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 A three hinged parabolic arch has a span of 60 m and central rise of 8 m. It is subjected to a point load of 40 kN at a distance of 10 m from left support and a u.d.l of 8 kN/m over right half span. Calculate the location and magnitude of maximum bending moment. Also calculate the radial shear, normal thrust and bending moment under 40 kN load. 12M

OR

2 A two hinged parabolic arch of spam 36 m and central rise 8 m carries a uniformly distributed load of 30 kN/m over left half of span. Determine the position and value of maximum bending moment and also find the normal thrust and radial shear at the section. Assume that the moment of inertia at a section various as a secant of the inclination at the section. 12M

UNIT-II

3 In a multistoried building consists of 4 Storied 3 bay frames spaced at 3 m c/c. Live load on floor slab is 3 kN/m^2 and dead load is 3.5 kN/m^2 . The spans of the beams from left to right are 6 m, 4 m and 4 m respectively. Storey height is 3.5 m. Moment of inertia of the beams is 1.5 times that of columns. Self weight of the beams is 3.4 kN/m. Determine the maximum moment in the beam at the junction of first span and second span of an intermediate floor Use Substitute Frame method. 12M

OR

4 State the assumptions made in Cantilever method of frame analysis and analyze the frame as shown in Figure 1. by Cantilever method of analysis. Draw the bending moment diagram.

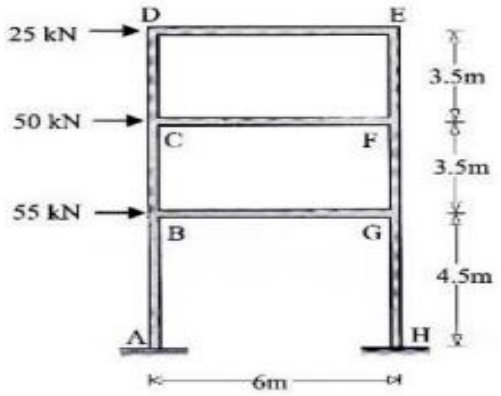

Figure.1 12M

UNIT-III

5 Four equal loads of 150 kN each equally spaced at 2 m apart followed by a uniformly distributed load of 60 kN/m at a distance of 1.5m from the last 150 kN load cross a girder of 20 m span from right to left. Using influence lines, calculate the shear force and bending moment at a section 8 m from left hand support when the leading 150 kN load is at 5 m from the left hand support 12M

OR

6 A single load of 100 kN rolls along a girder of 20 m span. Draw the diagrams of maximum bending moment and shear force (positive and negative).What will be the absolute maximum positive shear force and bending moment? 12M

UNIT-IV

7 Analyze the beam shown in figure 2 using flexibility matrix method if the support B' sinks by 50 mm. E = 25×10^3 MPa, I = 140×10^3 cm^4.

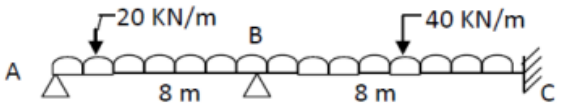

Figure.2 12M

OR

8 A two span continuous beam shown in figure 3. The moment of inertia is constant throughout. Analyze the beam by stiffness method.

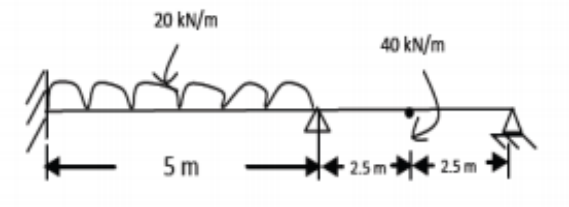

Figure.3 12M

UNIT-V

9 A two span continuous beam ABC has span lengths AB = 6 m and BC = 6 m and carries a U.D.L. of 30 KN/m completely covering the spans AB and BC. A and C are simple supports. If the load factor is 1.80 and the shape factor is 1.15 for the 'I' section, find the section modulus needed. Assume yield stress for the material as 250 MPa 12M

OR

10 Find out the collapse load for the continuous beam shown in figure 4.

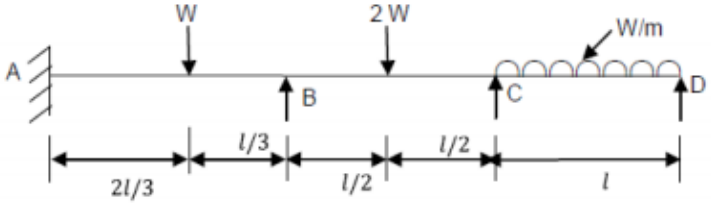

Figure 4 12M

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