

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Fifth Semester

CIVIL ENGINEERING

CEE113 Structural Analysis I

Time: Three Hours

Maximum Marks: 100

Answer all the Questions

PART A (10 x 1 = 10 Marks)

- The deflection at any point of a perfect frame can be obtained by applying a unit load at the joint in
 - Vertical direction
 - Horizontal direction
 - Inclined direction
 - The direction in which the deflection is required
- In a pin-jointed plane frame $(m + r) > 2j$, then the frame is
 - Stable and statically determinate
 - Stable and statically indeterminate
 - Unstable
 - Statically indeterminate
- Muller Breslau's principle is applicable to get influence line for which of the following?
 - Reaction at the ends of simple beam
 - Bending moment at a section
 - Shear force at section
 - Force and moment at any section
- What is the variation of influence line for stress function in a statically determinate structure
 - Parabolic
 - Bilinear
 - Linear
 - Uniformly rectangular
- The maximum B.M. due to an isolated load in a three hinged parabolic arch, (span l , rise h) having one of its hinges at the crown, occurs on either side of the crown at a distance
 - $L/4$
 - $H/4$
 - $L/2\sqrt{3}$
 - $L/3\sqrt{2}$
- The vertical reaction for the arch is
 - $Wa/2l$
 - Wl/a
 - Wa/l
 - $Wa^2/2l$
- Slope deflection method is also called as
 - Minimum strain energy Method
 - Consistent deformation Method

(OR)

- b) Using the method of virtual work, determine the horizontal displacement of a point C of the frame shown in Fig.2 Take $E = 2 \times 10^5 \text{ N/mm}^2$, $I = 4 \times 10^6 \text{ mm}^4$.

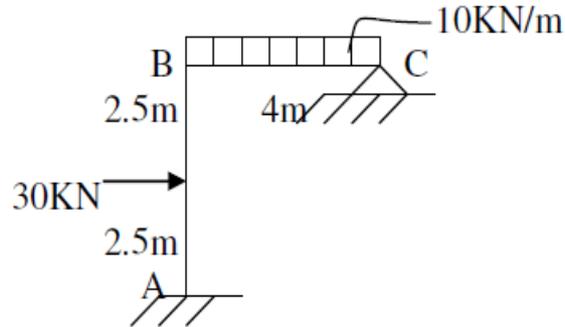


Fig.2

22. a) Using Influence line diagram, find (i) maximum Bending moment (ii) maximum positive and negative shears at 4m from left support A of a simply supported girder of span 10m, when a train of 4 wheel loads 10kN, 15kN, 30kN and 30kN spaced at 2m, 3m and 3m respectively cross the span with the 10kN load leading

(OR)

- b) Draw the Influence line diagram for shear force and bending moment for a section at 5m from left support of a simply supported beam, 20m long. Hence calculate the maximum B.M and S,F at the section. Due to uniformly distributed rolling load of length 8m and intensity 10kN/m run

23. a) A three hinged parabolic arch of span 40m and rise 8m carries a UDL of 30kN/m over the left half span. (i) Analyse the arch and draw the bending moment diagram. (ii) Also evaluate the thrust and shear force at a section 10m from left hinge.

(OR)

- b) A three hinged circular arch of span 16m and rise 4m is subjected to two point loads of 100kN and 80kN at left and right quarter span points respectively. Find the reaction at the supports. Find also BM, radial shear and normal thrust at 6m from the left support.

24. a) Analyse the beam shown in fig.3 by slope deflection method.

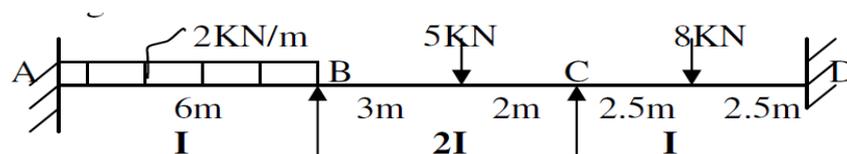


Fig.3

(OR)

- b) A beam ABC supported on a column BD is loaded as shown in fig.4 Analyze the frame by slope deflection method and draw bending moment diagram. t = Tons.

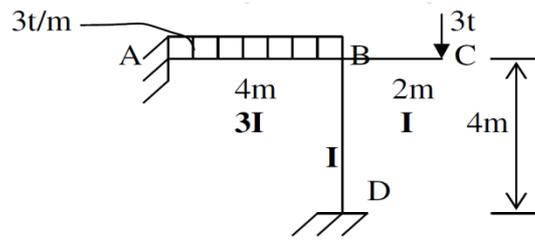


Fig.4

25. a) Analyse the continuous beam shown in fig.5 by moment distribution method and draw the bending moment diagram.

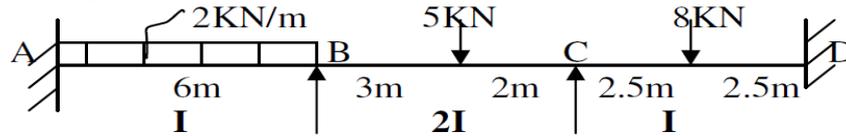


Fig.5

(OR)

- b) Analyse the frame shown in fig.6 by moment distribution method and draw BMD.

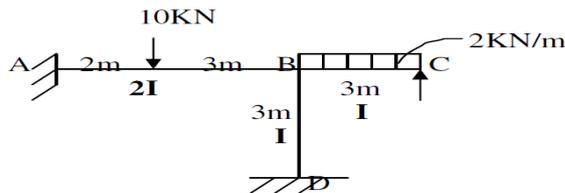


Fig.6
