



Register Number:.....

B.E DEGREE EXAMINATIONS: MAY 2015

Fifth Semester

CIVIL ENGINEERING

CEE113: STRUCTURAL ANALYSIS I

Time: Three Hours

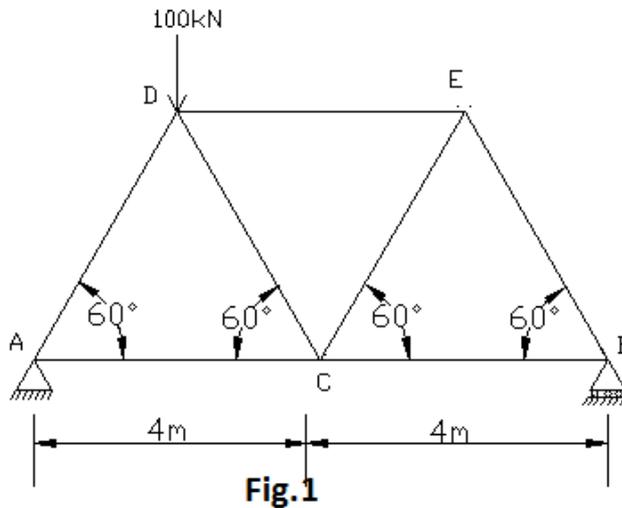
Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

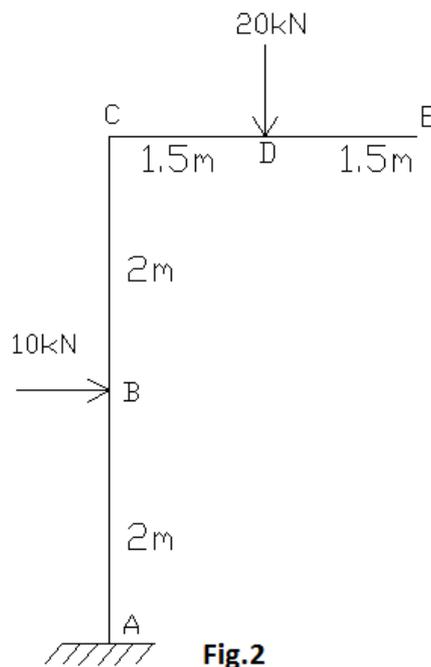
- The static indeterminacy of the pin jointed plane frame shown in Fig.1 is
 - 5
 - 1
 - 2
 - 0
- In an indeterminate truss, temperature of one member is increased. What nature of force will be developed in that member?
 - Member force is zero
 - Tension
 - Compression
 - Torsion
- The maximum ordinate for positive SF at any section x for a simply supported beam of span l is
 - $\frac{x}{l}(l-x)$
 - $\frac{(l-x)}{l}$
 - $\frac{x}{l}$
 - $\frac{l}{x}(l-x)$
- Influence line diagrams can be drawn either for a force or deformation to indicate its ordinate
 - At the support as a unit load moves over the structure
 - Under a unit load as it moves over the structure
 - At a section as a unit load moves over the structure
 - General Behaviour of the structure
- The arch moment will be
 - Moment due to horizontal thrust + Equivalent beam moment
 - Moment due to horizontal thrust - Equivalent beam moment
 - Equivalent beam moment - Moment due to horizontal thrust
 - Equivalent beam moment + Moment due to horizontal thrust

21. a) Fig.1 Shows a pin jointed truss loaded with a single concentrated load of 100kN. If the area of cross section of all members shown in Fig.1 is 1000 mm^2 , what is the vertical deflection of point C? Take $E = 200 \text{ kNmm}^2$ for all members.



(OR)

- b) Determine the vertical and horizontal deflection at the free end of the frame shown in Fig.2 by principle of virtual work method. Assume uniform flexural rigidity EI throughout.



22. a) Two concentrated rolling loads of 16 kN and 8 kN placed 2 m apart, travel along a freely supported girder of 10m span. Construct the influence line diagrams for shear force and bending moment for a point 4m from the left abutment, and find the maximum bending moment and shear force at that point. Also calculate the absolute bending moment.

(OR)

- b) Draw the influence line diagram for the bending moment at D, the middle point of BC, of a continuous beam shown in Fig.3 Summarize the ordinates at 1m interval.

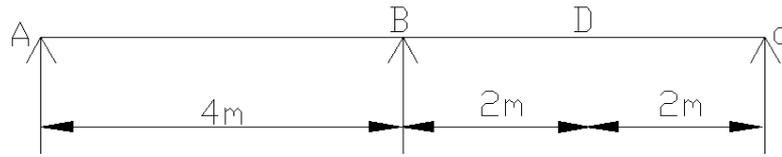


Fig.3

23. a) A three hinged parabolic arch hinged at the springing and crown points has a span of 24m and a central rise of 4m. It carries a concentrated load of 50kN at the 18m from left support and a uniformly distributed load of 30kN/m over the left half portion. Find the reactions at the supports, bending moment, normal thrust and shear at a section 6m from the left support.

(OR)

- b) A parabolic arch hinged at ends has a span of 30 m and rise 5m. A concentrated load of 12kN acts at 10m from the left hinge. The second moment of area varies as the secant of the slope of the rib axis. Calculate the horizontal thrust and the reactions at the hinges. Also calculate the maximum bending moment anywhere on the arch.

24. a) Analyze the continuous beam given in Fig.4 by slope deflection method and draw the B.M.D.EI is Constant.

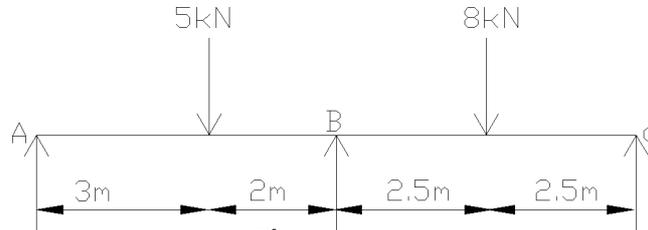


Fig.4

(OR)

- b) Analyze the rigid frame given in Fig.5 by slope deflection method and draw the B.M.D

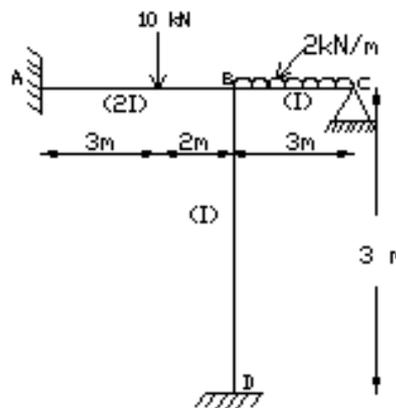
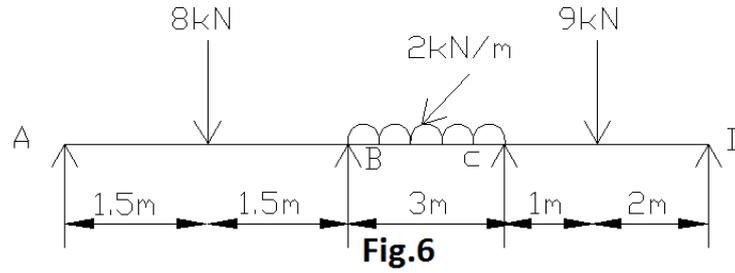


FIG.5

25. a) Analyze the continuous beam ABCD as shown in Fig.6 by moment distribution method and draw B.M.D. EI is Constant.



(OR)

- b) A continuous beam ABC is supported on an elastic column BD, and is loaded as shown in Fig.7 treating joint B as rigid, analyze the frame and plot B.M.D.

