MACHAKOS UNIVERSITY

University Examinations for 2020/2021Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 305 THEORY OF STRUCTURES III

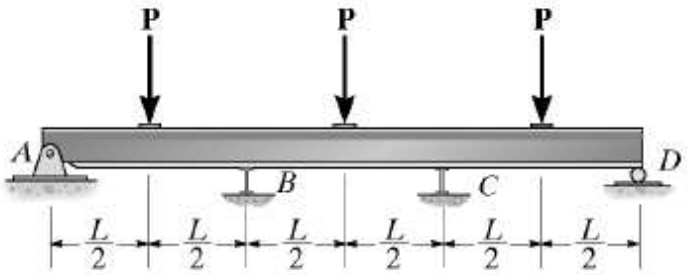
DATE: 23/3/2021 **TIME: 2.00-4.00 PM**

INSTRUCTIONS

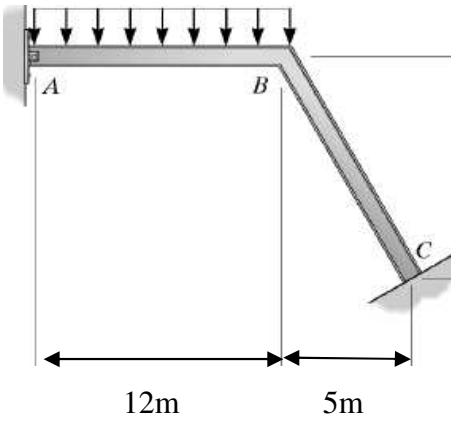
Answer question one and any other two questions

1. Discuss the following terms used in moment distribution method.
   a) Fixed End Moments (FEM) (5 marks)
   b) Member stiffness Factor (k) (5 marks)
   c) Joint Stiffness Factor (5 marks)
   d) Distribution Factor (DF) (5 marks)
   e) Member relative Stiffness Factor (5 marks)
   f) Carry Over Factor (5 marks)
2. The continuous beam supports three concentrated loads.Determine the maximum moment in the beam and draw the moment diagram EI is constant. (**Use slope deflection method**)

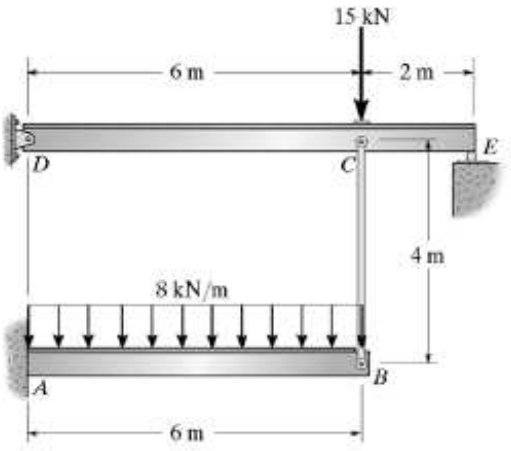
(20 marks)



3. Determine the moment at B, then draw the moment diagram of the frame. Support A is pinned. EI is constant. (**Use moment distribution method**). Vertical height BC is 12m, and distributed load is 1.5 KN/m. (20 marks)



4. The structural assembly supports the loadings shown. Draw the moment diagrams for each of the beams , take I=100(106) mm4 for the beams and A=200mm2 for the tie rods. All members are made of steel for which E=200GPa. **Use virtual work method.** (20 marks)



Fixed End Moments