



# MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

DIPLOMA IN CIVIL ENGINEERING

BCECD 302: THEORY OF STRUCTURES III

DATE: 18/01/2021

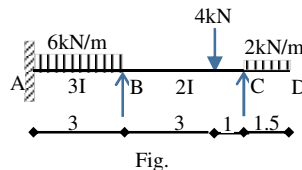
TIME: 8.30-10.30 AM

## INSTRUCTIONS

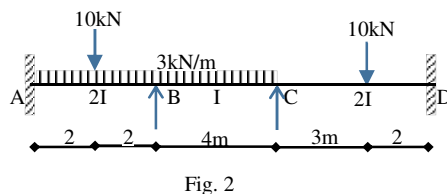
- This paper consists of **Five** questions.
- Answer question **ONE** and any other **TWO** questions
- Maximum marks for each part of the question are as shown.

## QUESTION ONE (30 MARKS) (COMPULSORY)

- a) Using the three moments theorem, analyze the beam shown in figure 1 and hence sketch the shear force diagram indicating the values at critical points. (15 marks)

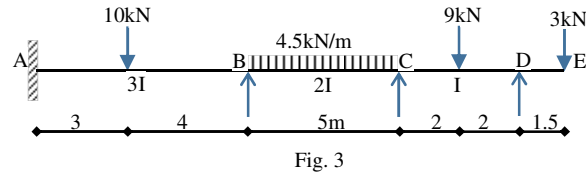


- b) Using the moment distribution method, analyze the beam shown in figure 2 and hence sketch the bending moment diagram indicating the values at all critical points. (15 marks)



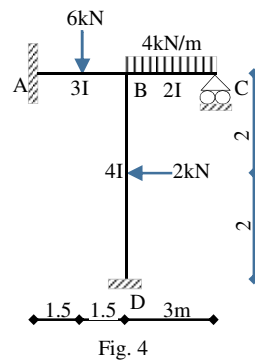
### QUESTION TWO (20 MARKS)

Using the three moments theorem, analyze the beam shown in figure 3 and hence sketch the shear force and bending moment diagrams indicating the values at critical points.



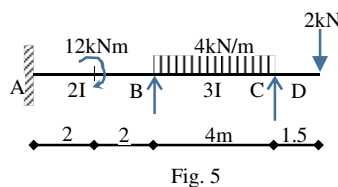
### QUESTION THREE (20 MARKS)

Analyze the frame shown in figure 4 using the moment distribution method hence sketch the bending moment diagram indicating the values at all critical points.



### QUESTION FOUR (20 MARKS)

Using the three moments theorem, analyze the beam shown in figure 5 and hence sketch the bending moment diagrams indicating the values at critical points.



### QUESTION FIVE (20 MARKS)

A continuous beam of uniform section is loaded as shown in figure 6. Using the method of moment distribution, analyze the beam and hence sketch the bending moment diagram indicating the values at all critical points.

