



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2019/2020

THIRD YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF  
BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING

ECT 3354: ANALYSIS OF STRUCTURES IV

DATE: OCTOBER 2020

TIME: 2 HOURS

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INSTRUCTIONS: Answer question *one* and any other *two* questions

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## QUESTION ONE (30 MARKS)

- a) State the difference between determinate and indeterminate structures (5 marks)
- b) State the three equilibrium equations of static equilibrium (5 marks)
- c) Using moment-distribution method determine the following for the beam shown below:
  - i. All the reactions at point A,B,C and E (10 marks)
  - ii. Draw the bending moment diagram and shear diagram (10 marks)

**QUESTION TWO (20 MARKS)**

- a) Determine the reactions and draw the shear and bending moment diagrams for the beams shown in the figure 2 using the three-moment equation

**QUESTION THREE (20 MARKS)**

- a) Determine the reaction and draw the shear and bending moment diagrams for the beam shown in figure 3 by using the moment-distribution method

**QUESTION FOUR (20 MARKS)**

- a) Determine the reactions and the moments of the frame shown in figure 4 and draw the shear forces and the bending moment diagram using slope deflection method

**QUESTION FIVE (20 MARKS)**

- a) Determine the reactions and draw the shear and bending moment diagrams for the beams shown in the diagram below using slope deflection method