



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF BUILDING & CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING
DCE 2309: STRUCTURES 1V

END OF SEMESTER EXAMINATION
SERIES: APRIL 2025
TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

- Answer Booklet,
- examination pass
- student ID
- Scientific Calculator

This paper consists of five questions.

Attempt any THREE questions.

Do not write on the question paper.

QUESTION ONE (20 Marks)

(a) Figure 1 shows an indeterminate. Find the values of R_A R_B R_C and M_B (14 Marks)

(b) Also, determine the points of contraflexure on the deflected curve. (6 Marks)

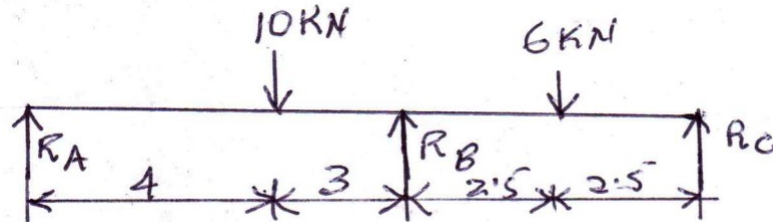


Figure 1

QUESTION TWO (20 Marks)

(a) Using Three moments theorems, determine the values of R_A R_B R_C and M_B in Fig 2. (12Marks)

(b) Draw the shear force and bending moment diagrams. I is constant throughout. (8Marks)

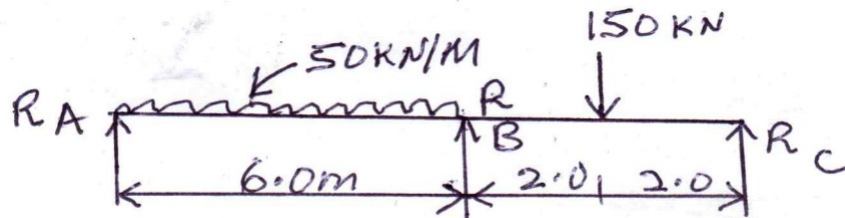


Figure 2

QUESTION THREE (20 Marks)

The continuous beam A,B and C is fully encastre at A and C and simply supported at B. A, B and C are all at the same level. I is constant throughout. Calculate the fixing moments at A and C , and the support moment at B

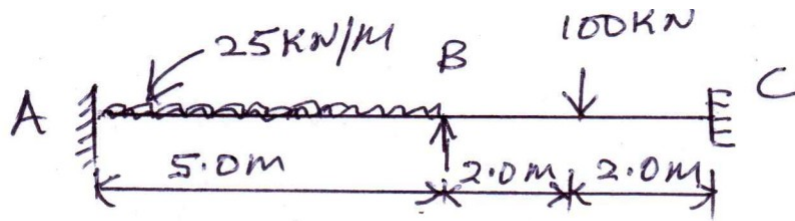


Figure 3

QUESTION FOUR (20 Marks)

A masonry pile of 3x4 m supports a vertical load of 100 kN as shown.

- Find the stresses developed at each corner of the pile. (12 Marks)
- Determine the additional load to be placed at the centre of the pile so that there is no tension anywhere on the pile. (2 Marks)
- Determine the stresses at the corners with the additional load at the centre.

(6

Marks)

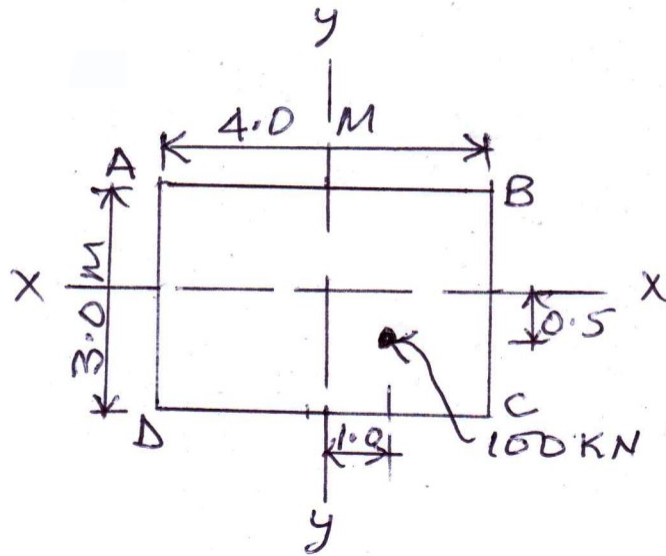


Figure 4

QUESTION FIVE (20 Marks)

A simply supported beam has a span of 20 meters. A uniformly distributed load of 20 kN/M and 5 meters long crosses the span. Determine the maximum bending moment produced at a point 8 meters from the left support