



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

**BACHELOR OF SCIENCE IN CIVIL ENGINEERING
(INSTITUTION BASED EXAMINATION)**

ECE 2307 : THEORY OF STRUCTURES III

END OF SEMESTER EXAMINATION

SERIES: MARCH 2017

TIME: 2 HOURS

DATE: 3rd April 2017

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of five questions.

Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

QUESTION ONE (COMPULSORY)

- (a) Evaluate the bending moment and shear force diagrams of the beam shown in Figure Q1(a) using the three-moment theorem. (20 Marks)

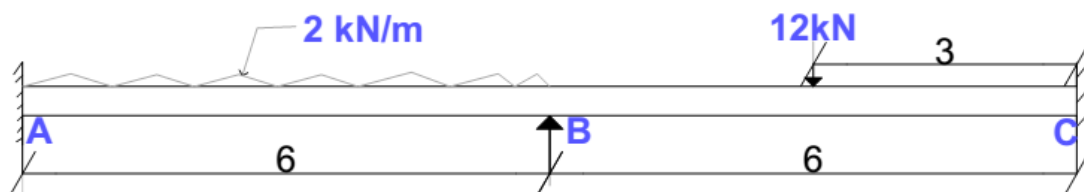


Figure Q1(a)

- (b) Determine the slope and moments of the beam shown in Figure Q1(b) by using the slope deflection method. (10 Marks)

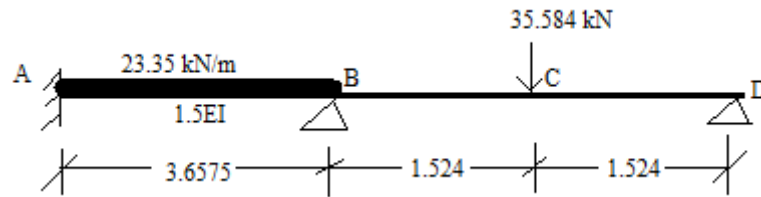


Figure Q1(b)

Attempt any TWO questions

QUESTION TWO

Analyze the continuous beam shown in Figure Q2 using the moment distribution method and sketch the shear force diagram and the bending moment diagram. (20 Marks)

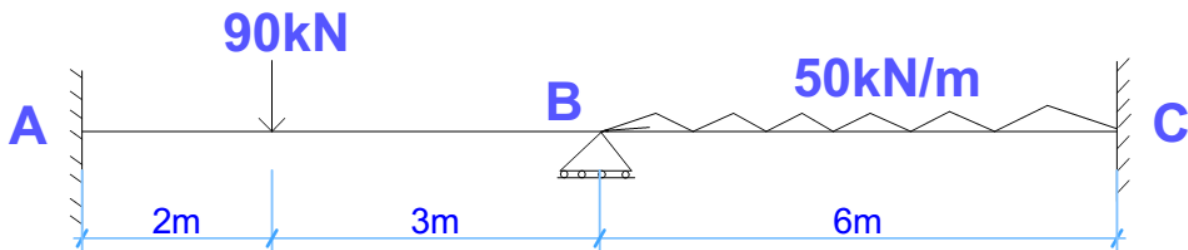


Figure Q2

QUESTION THREE

A three-hinged parabolic arch of span 40m and rise 10m is carrying a uniformly distributed load as shown in Figure Q3. Find the horizontal thrust at the spring. (20 Marks)

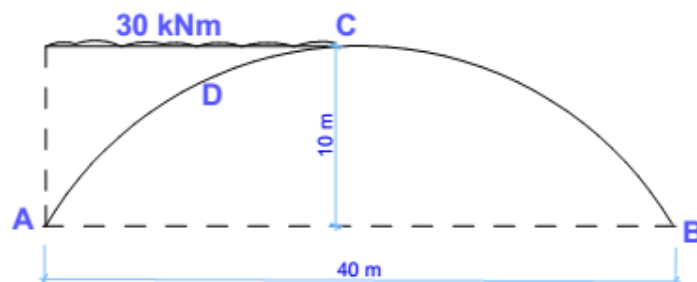


Figure Q3

QUESTION FOUR

Find the force in bar 6 of the truss shown in Figure Q4, using the method of consistence deformation given $E = 10\text{Gpa}$, $A = 100\text{ cm}^2$ for all bars. (20 Marks)

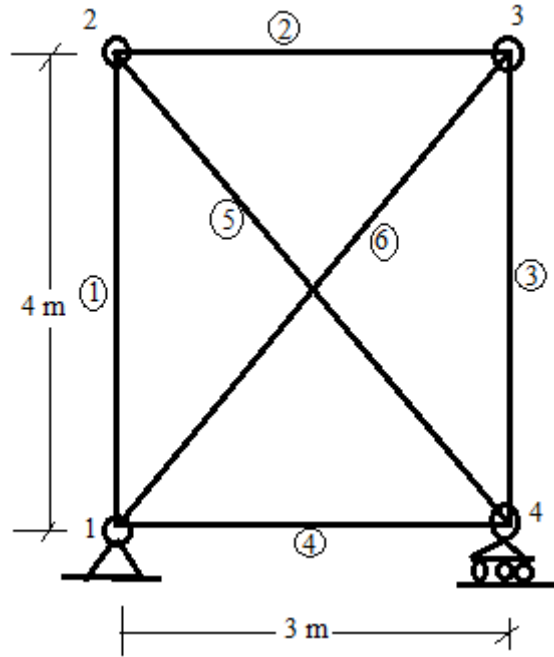


Figure Q4

QUESTION FIVE

Determine the moments at the supports of the continuous beam shown in Figure Q5 using the moment distribution method assuming that EI is constant with $E = 200\text{GPa}$ and $I = 200\text{E}6\text{ mm}^4$. (20 Marks)

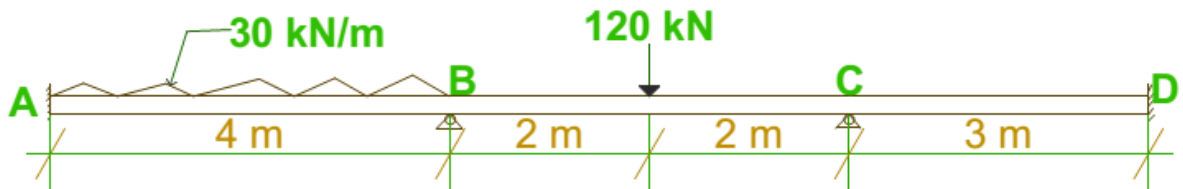


Figure Q5