



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

BSC IN CIVIL ENGINEERING

ECE 2307: THEORY OF STRUCTURES III

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: 13 May 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, Drawing Instruments, Scientific calculator, examination pass and student ID

This paper consists of five questions. Attempt question ONE (Compulsory) and any other TWO questions.

QUESTION ONE (30 marks)

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

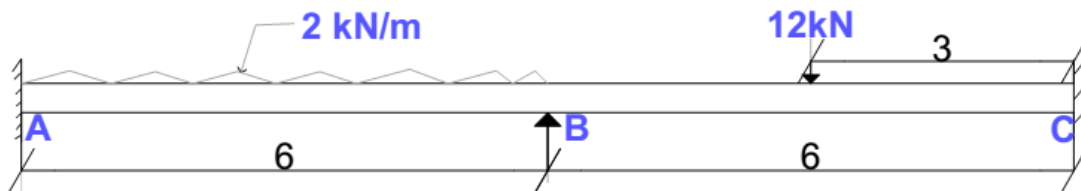


Figure Q1(a)

- (b) Construct the influence line for vertical reaction Y_B of the indeterminate beam shown in figure Q1(b) by static method. (10 Marks)

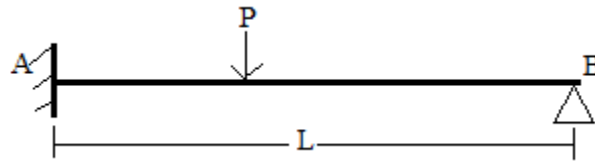


Figure Q1(b)

QUESTION TWO (20 Marks)

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)

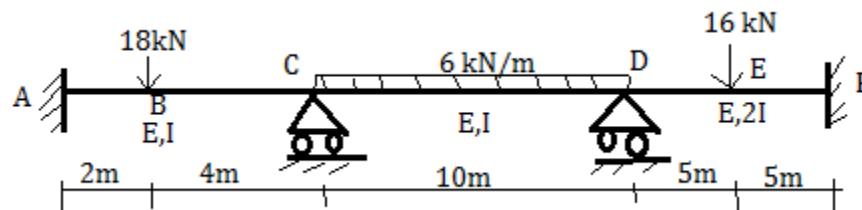


Figure Q2

QUESTION THREE (20 Marks)

Determine the position and calculate the value of the maximum bending moment in the loaded half of the semi-circular three-pinned arch shown in Figure Q3. (20 Marks)

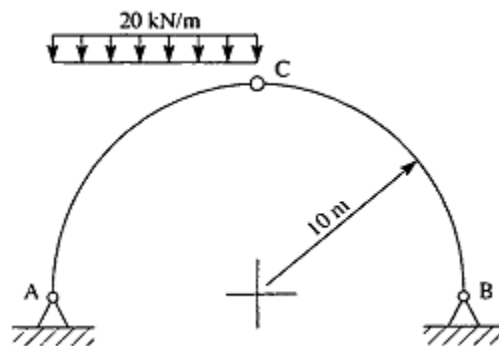


Figure Q3

QUESTION FOUR (20 Marks)

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)

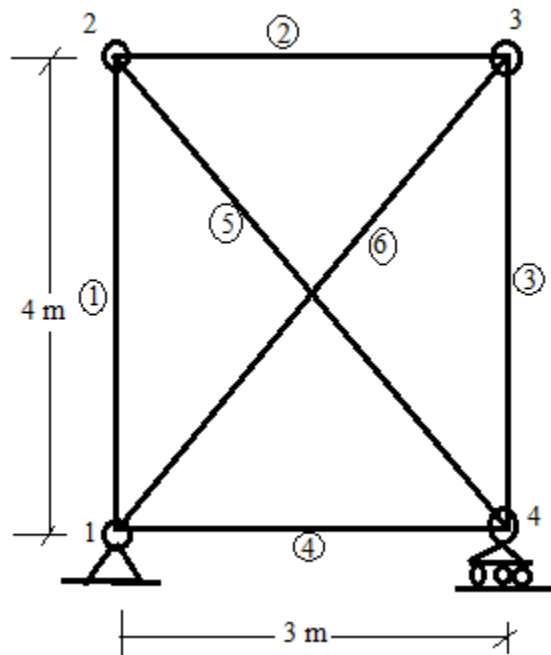


Figure Q4

QUESTION FIVE (20 Marks)

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)

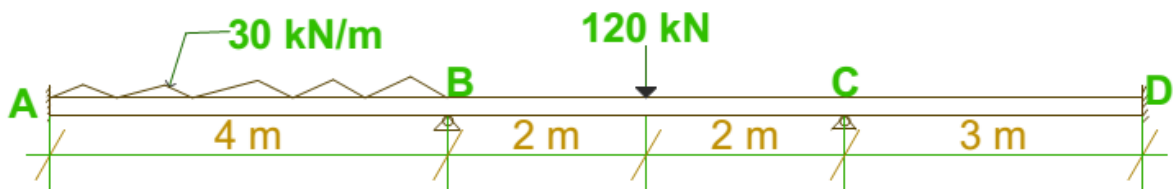


Figure Q5