



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of BUILDING & Civil engineering

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING

TCV 4213: ANALYSIS OF STRUCTURES I

END OF SEMESTER EXAMINATION

SERIES: JANUARY 2025

TIME: 2 HOURS

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.

All symbols have their usual meaning

Do not write on the question paper.

QUESTION ONE (30 Marks)

- (a) The beam ABCDE shown in Figure Q1(a) carries two-point loads plus a UDL. Draw the S.F.D and B.M.D for the beam, indicating all significant values. (15 Marks)

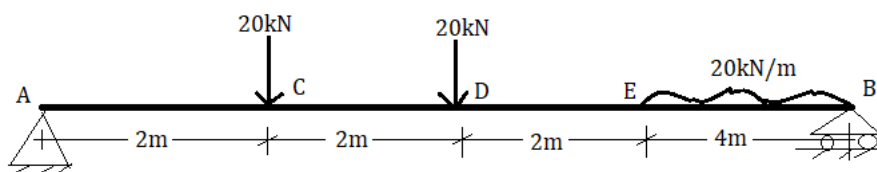


Figure Q1(a)

- (b) A cable support loads at B and C as shown in Figure Q1(b). Determine the sag at point C and the maximum tension in the cable. (15 Marks)

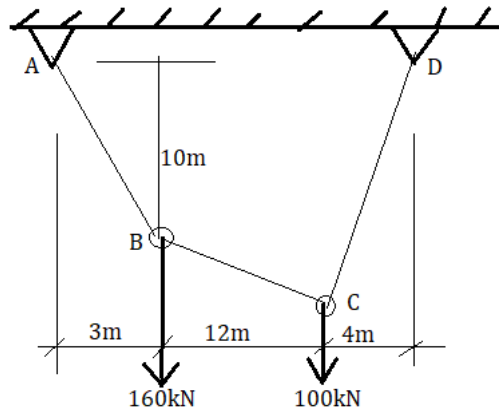


Figure Q1(b)

QUESTION TWO (20 Marks)

Figure Q2 shows an unsymmetrical parabolic arch of span 90m. The right-hand springing B is 9 m above the left-hand springing A. The crown C is at 50m from A and 25m above it. It is required to find the reactions under the given loads at point D.

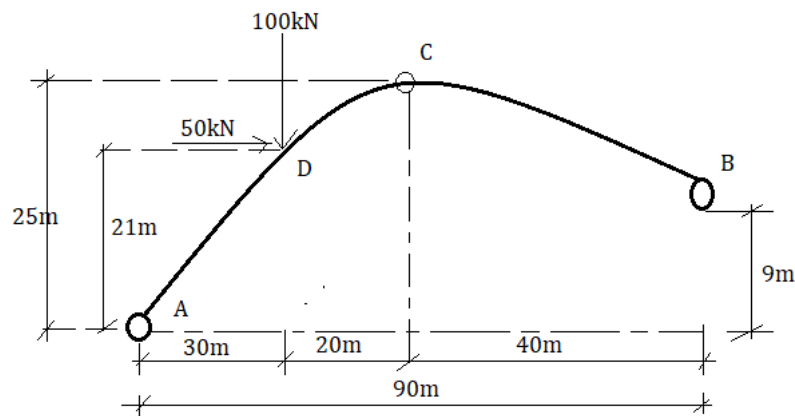


Figure Q2

QUESTION THREE (20 Marks)

- Clear differentiate between collinear, coplanar and concurrent forces. (6 Marks)
- Determine the horizontal and vertical components of reaction at the pins A, B and C of the two-member frame shown in figure Q3(b). (14 Marks)

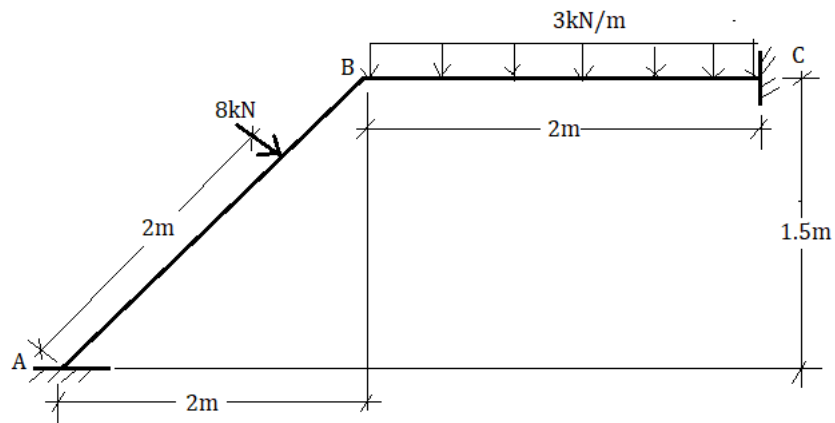


Figure Q3(b)

QUESTION FOUR (20Marks)

Analyse the truss shown in Figure Q4 using the method of resolution by joints. Clearly indicate the nature of the force.

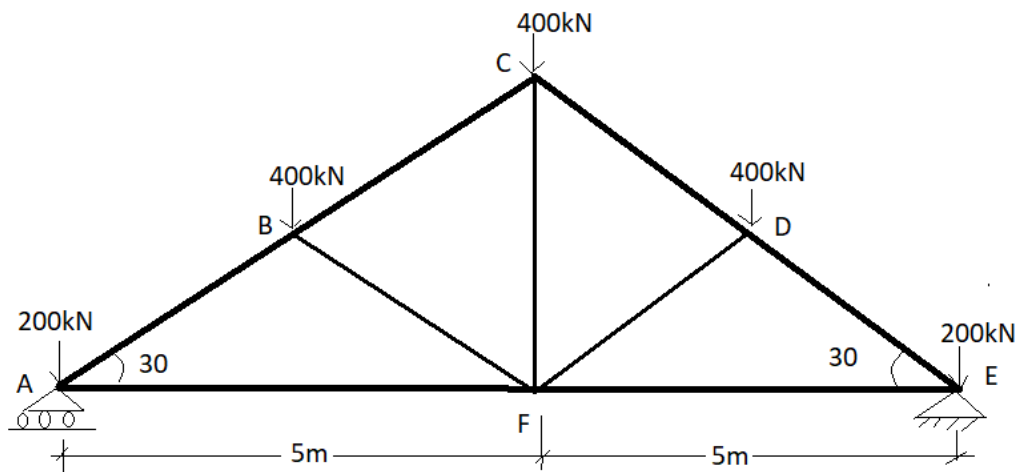


Figure Q4

QUESTION FIVE (20 Marks)

Draw the shear force and bending moment diagrams for the beam shown in figure Q5. (20 marks)

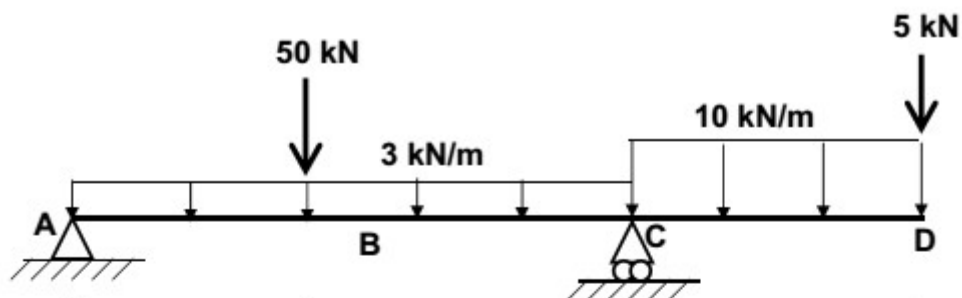


Figure Q5