



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ARCHITECTURE & BUILT ENVIRONMENT

UNIVERSITY EXAMINATION FOR:
DIPLOMA IN QUANTITY SURVEYING
EAR 4209: STRUCTURES FOR ARCHITECTS I
END OF SEMESTER EXAMINATION
YEAR THREE SEMESTER ONE

SERIES: APRIL 2023

TIME: 2 HOURS

DATE: APRIL, 2025

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 (30 Marks)

- (a) State the types of loads that take place internally in: beams, cables, trusses and arches. (12 marks)
- (b) The beam ABCDE shown in figure Q1(b) carries a UDL of 6 kN/m over BC, plus a point load of 20 kN at D. Draw the S.F.D and B.M.D for the beam, indicating all significant values. (12 marks)

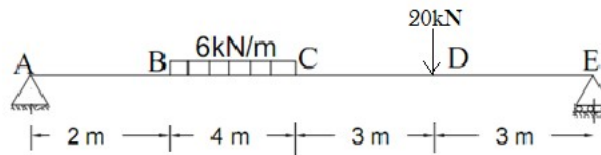
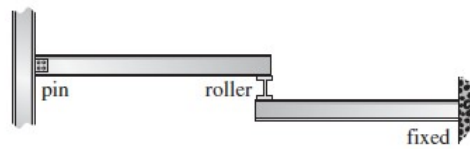
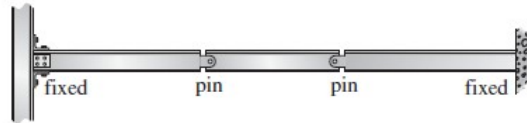


Figure Q1(b)

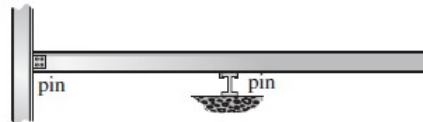
- (c) Classify the members below as structurally determinate or indeterminate. (6 marks)



(a)



(b)



QUESTION TWO (20 Marks)

- (a) Calculate the support reactions in the structure below. C and D are fixed. (10 marks)

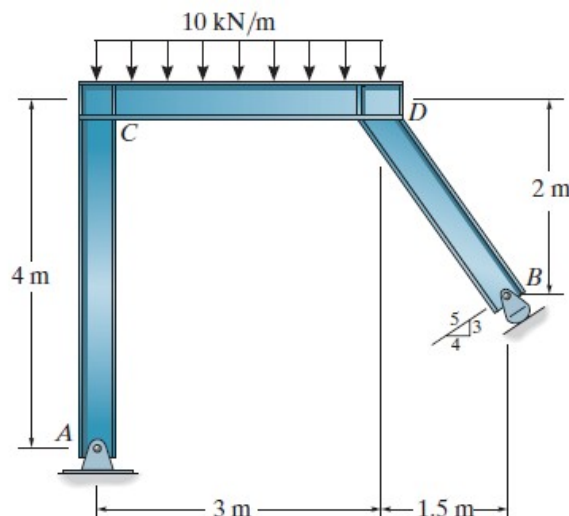


Figure Q2(a)

- (b) Calculate the support reactions in the simply supported beam AB shown in figure Q2(b). there is a pin at C (10 marks)

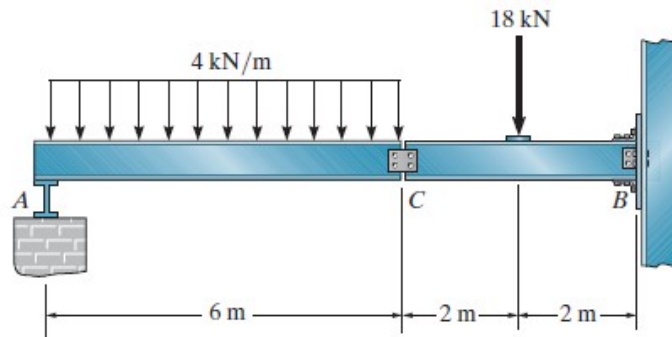
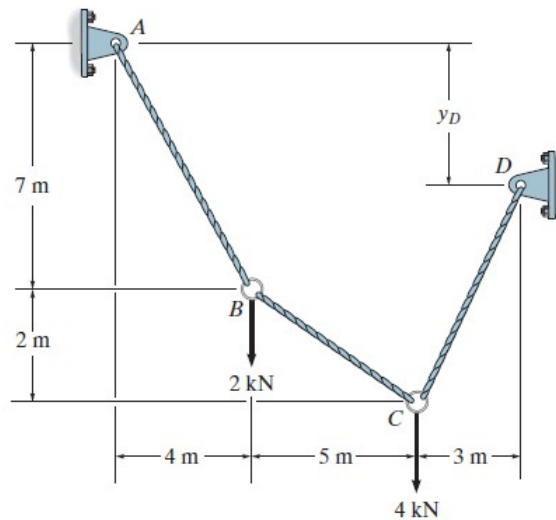


Figure Q2(b)

QUESTION THREE (20 Marks)

Determine the tension in each cable segment and the distance y_D .



QUESTION FOUR (20Marks)

Determine the force in each member of the truss. State whether the member is compression or tension.
 $P=9\text{kN}$

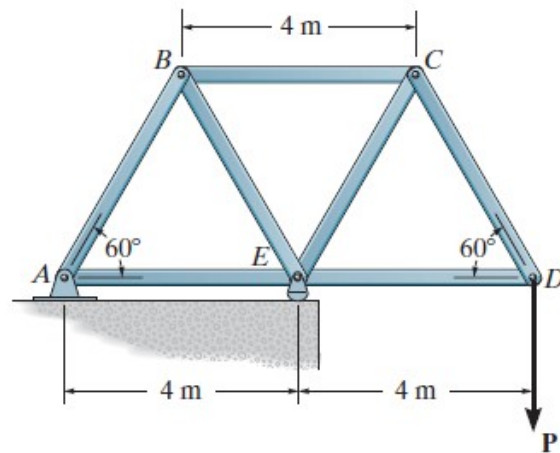


Figure Q4

QUESTION FIVE (20 Marks)

Figure Q5 shows a 3 hinged arch that is subjected to a uniform load of 20 kN/m . Determine the internal moment at point D.

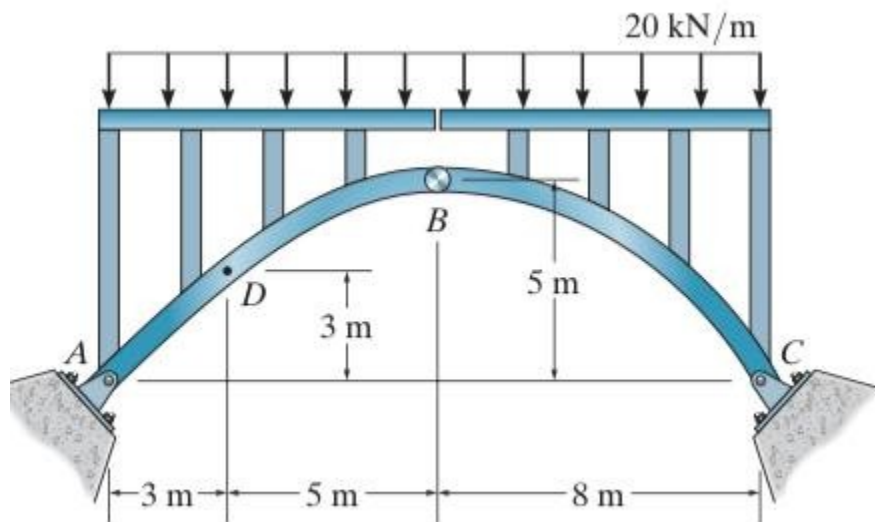


Figure Q5