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

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MARCH 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

Do not write on the question paper.

QUESTION ONE (COMPULSORY) (30 Marks)

(a) Using figures, describe three types of supports used to support structures. (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. (18 marks)

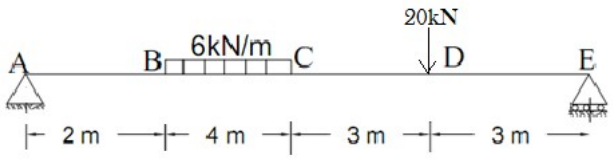

Figure Q1(b)

QUESTION TWO (20 Marks)

(a) Calculate the support reactions in the simply supported beam ABCD shown in figure Q2(a). (10 marks)

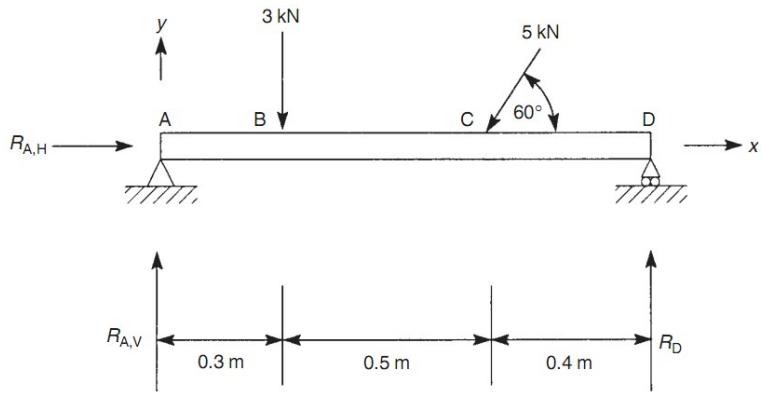

Figure Q2(a)

(b) Calculate the support reactions in the simply supported beam AB shown in figure Q2(b). (10 marks)

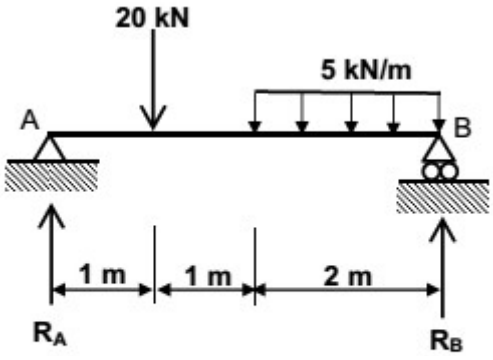

Figure Q2(b)

QUESTION THREE (20 Marks)

A light cable 18m long, is supported at two ends at the same level. The supports are 16m apart. The cable supports 120N load dividing the distance into two equal parts. Find the shape of the cable and tension in cable.

QUESTION FOUR (20Marks)

A truss of span 5m is loaded as shown in Figure Q4. Find the reactions and forces in the members of the truss.

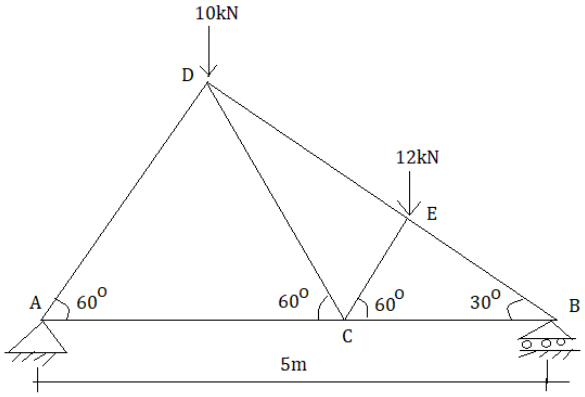

Figure Q4

QUESTION FIVE (20 Marks)

Figure Q5 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 D.

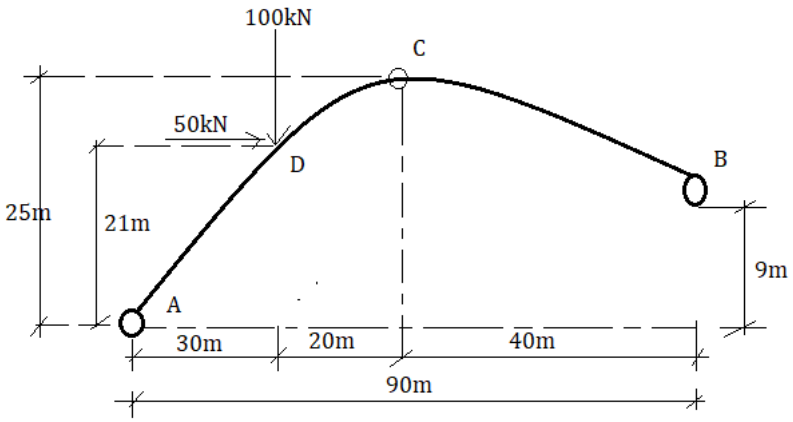

Figure Q5