TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

EBC 2207: THEORY OF STRUCTURES II

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination

- Answer booklet
- Scientific calculator

This paper consists of **FIVE** questions
Answer any other **THREE** questions
Use neat, large and well labelled diagrams where required
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed papers.

ECE 2207: THEORY OF STRUCTURES II

QUESTION ONE

a) Derive an expression for maximum deflection and slope of a simply supported beam of length 'L' carrying a uniformly distributed load of 'w per unit length'. Take the flexural rigidity of the beam to be constant. **(10 marks)**

b) A cantilever 8 metres long is carrying a point load of 12KN at the free end. Determine the slope and deflection at a point 4 metres from the fixed end. Take E=20GPa and I=360x$10^6$$mm^4$ **(10 marks)**

QUESTION TWO

A uniform beam of length 20 metres is simply supported at its ends.it carries two concentrated loads as shown in figure Q2 below. Determine the deflection of the beam at points C and D by the McCauley's method. Take E=207GPa and I=$10^{10}$$mm^4$ (**20 marks)**

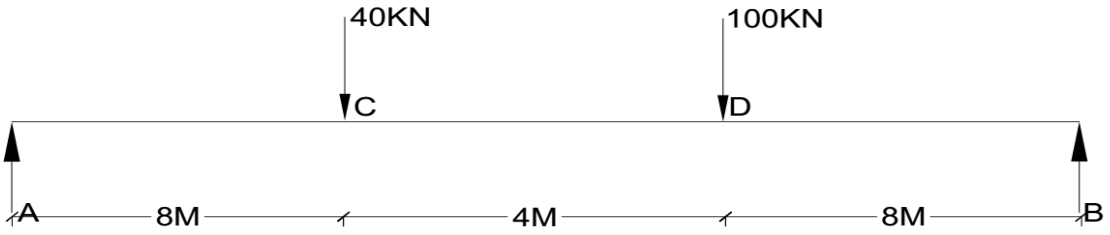

Figure Q2

QUESTION THREE

Figure Q3 shows an overhanging beam carrying a uniformly distributed load of 1KN/m Using the Mohr's moment area theorem determine the slope and deflection at point C. Take E=200GPa and I=250 x $10^6$$mm^4$ **(20marks)**

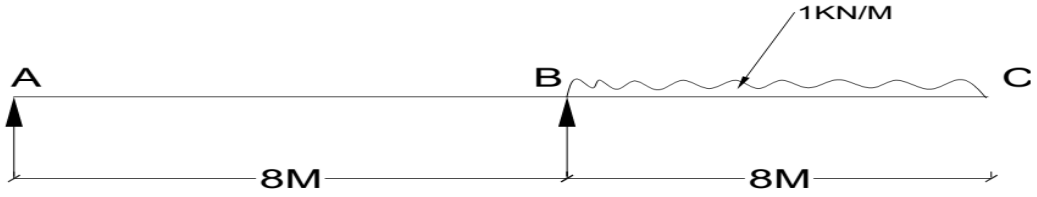

Figure Q3

QUESTION FOUR

Figure Q4 below shows a simply supported beam of span 3.6 metres. It partially carries a uniformly distributed load of 1500N/M along its span, an anticlockwise moment of 1440Nm is applied to the beam at a point C 1 metre from support A. Determine the slope and deflection at point C. **(20marks)**

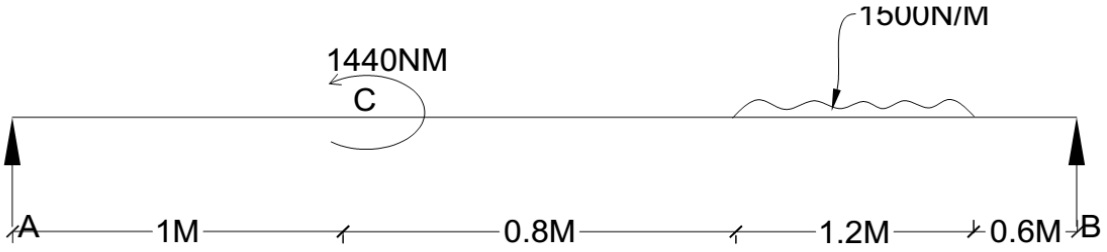

Figure Q4

QUESTION FIVE

Figure Q5 below shows a pin-jointed truss ABCD carrying both a vertical and a horizontal load at joint B as indicated. Determine the magnitude of the resultant deflection at joint B. Take AE=100x10^{3}KN. **(20 marks)**

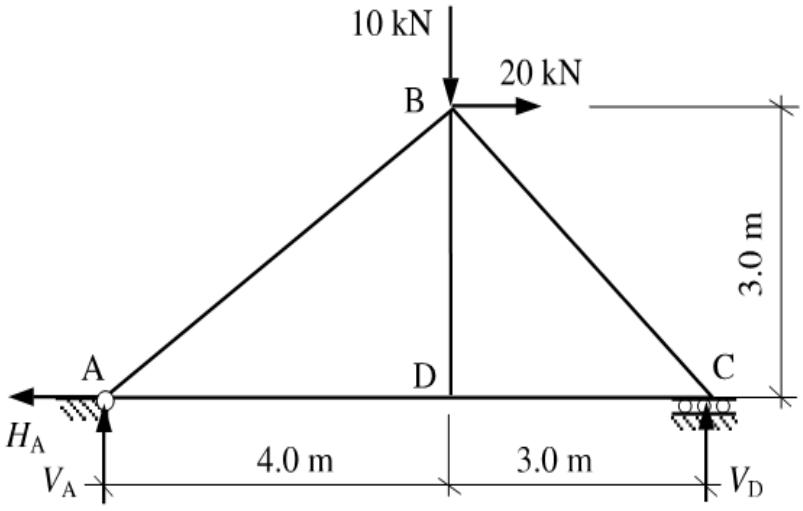

Figure Q5