THE TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE

CIVIL ENGINEERING

ECE 2307 THEORY OF STRUCTURES III

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- Answer booklet

This paper consists of **FIVE** questions

Answer question **ONE (COMPULSORY)** from **SECTION A** and any other **TWO** questions from **SECTION B**

Maximum marks for each part of a question are clearly shown

This paper consists of **TWO** printed pages

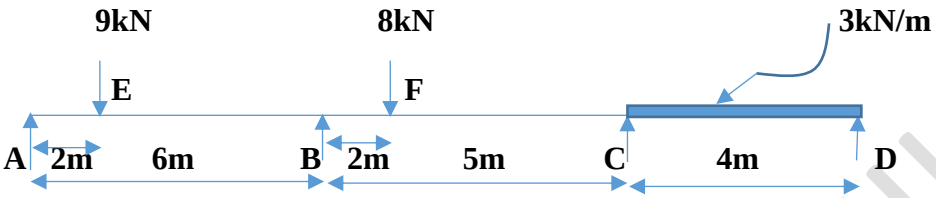
SECTION A (*COMPULSORY -30 MARKS*)

QUESTION 1

(a)Derive Clapeyron's Three Moment Equation **(10 Marks)**

(b)A continuous beam ABCD ,simply supported at A ,B,C and D,is loaded as shown below.

Using three moment theorem find the moments over the beam and draw bending moment and shear force diagrams. **(20marks)**

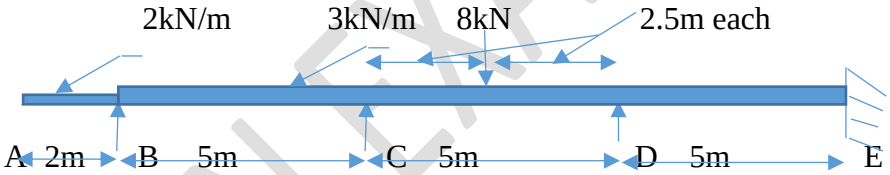


SECTION B *(Answer any TWO questions from this section.Each question carries 20 marks)*

QUESTION 2

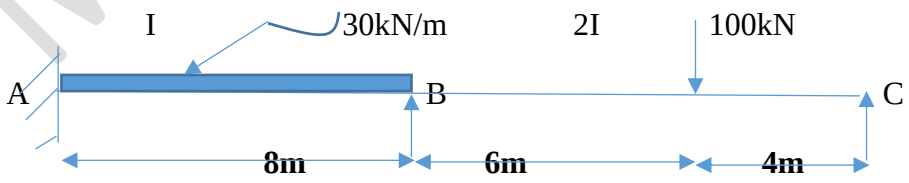
A continuous beam ABCDE,with uniform flexural rigidity through out has roller supports at B,C and D,a built-in support E and an overhang AB as shown below.

It carries a uniformly distributed load of intensity of 2kN/M on AB and another of intensity of 3kN/m over BCDE.In addition to it ,a point load of 8kN is placed midway between C and D .The span lengths are AB=2m,BC=CD=DE=5m.Obtain the support moments by the moment distribution method and sketch the B.M. diagram giving values at salient points.



QUESTION 3

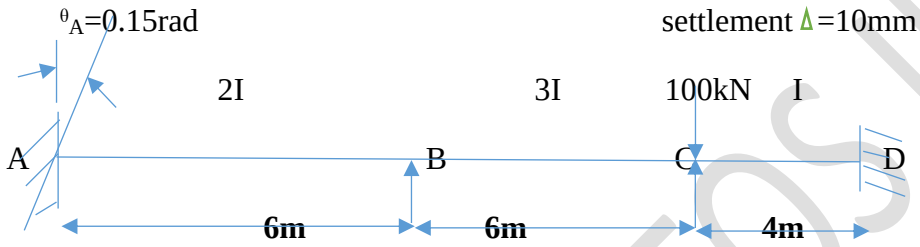
Using slope deflection method determine the support moments for the beam shown and plot the bending moment diagram. **(20marks)**



QUESTION 4

Determine the support moments of the continuous beam shown below.The support at A rotates through 0.15radian in a clockwise direction and the support at C settles down 10mm;E=2.1X10^{5}N/mm2 and I=4X10^{4}mm^4. Use slope deflection method.

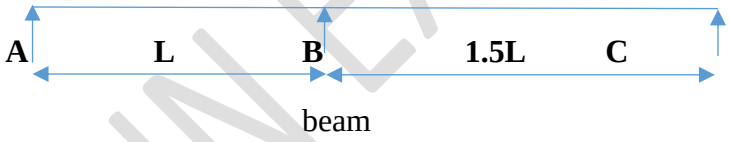
EI=8400kN/m^2



QUESTION 5

Compute the ordinates at intervals of L/4 of the influence line for RA for the two span continuous beam shown below for which EI is constant.

(20marks)



beam