TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING & CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECE 2317: THEORY OF STRUCTURES III
SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: SEPTEMBER 2018
TIME: 2 HOURS

Instructions to Candidates
You should have the following for this examination
  -Answer Booklet, examination pass and student ID
  -Drawing instruments.
This paper contains FIVE questions
Answer question ONE and any TWO questions.
Marks for each question are indicated in the parenthesis.

Do not write on the question paper.

QUESTION ONE (30 MARKS)
  a) Using moment distribution method, find reaction at supports and draw shear force and bending moment diagram for the continuous beam shown in figure Q1(a)
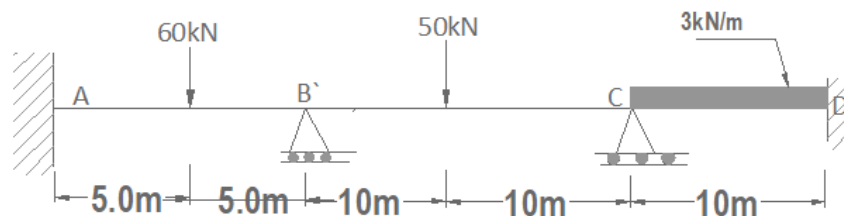

Figure Q1(a)

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

ANSWER ANY TWO QUESTIONS FROM THIS SECTION
QUESTION TWO (20 Marks)
Analyze the continuous beam shown in Figure Q2 by the Three moment equation HENCE draw the shear force and bending moment diagram. (20 marks)
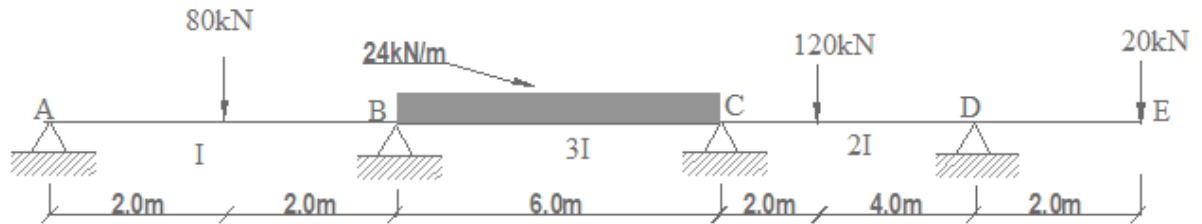

Figure Q2

QUESTION THREE (20 Marks)
Analyse the rigid frame as shown in Fig. Q3 and draw the bending moment diagram. The moment of inertia for all the members is shown in the figure. Neglect axial deformations.
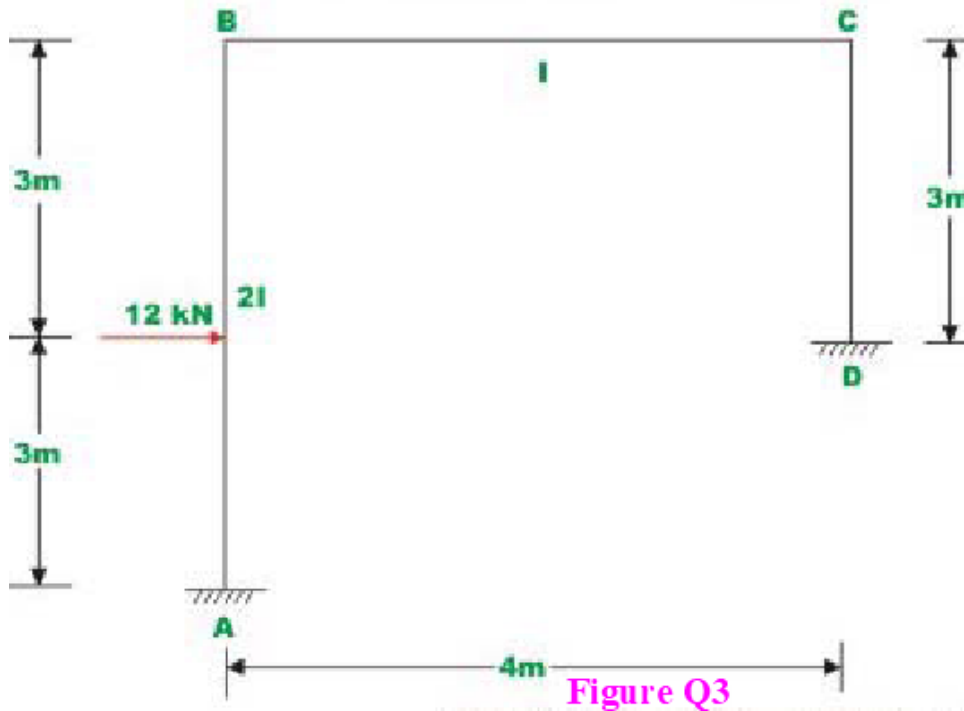

Figure Q3

QUESTION FIVE (20 Marks)
For figure Q4 draw the influence line and plot numerical values every 2 m for:
 a) The vertical reaction at supports A, B and C
 b) Shear at G and E
 c) Bending moment at G and E
   EI is constant.

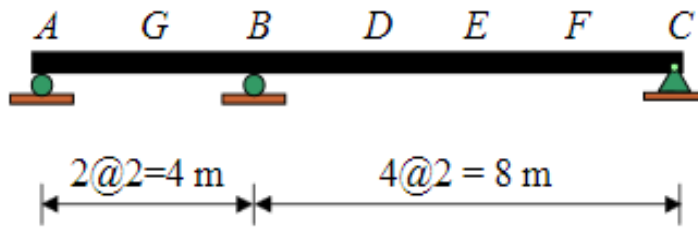A G B D E F C

2@2=4 m   4@2 = 8 m

Figure Q4

QUESTION FIVE (20 Marks)

a) Analyze the continuous beam shown in Figure Q5 (a) by the Three moment equation. Draw the shear force and bending moment diagram.

120KN   20kN/m
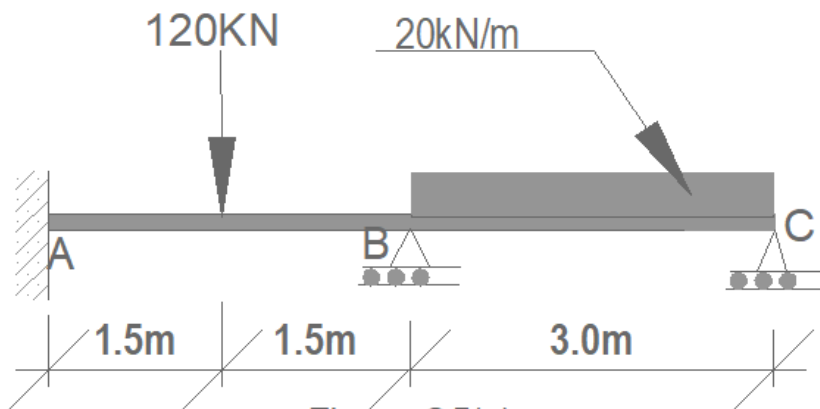
A   B   C

1.5m   1.5m   3.0m

Figure Q5(a)

(10 Marks)

b) Using clear sketches and slope deflection equations, explain the procedure involved in the moment distribution equations.

(10Marks)