THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING

DIPLOMA IN ARCHITECTURE (DA 10A)

EBC 3112: THEORY OF STRUCTURES III

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011

TIME: 2 HOURS

<u>**Instructions to Candidates:**</u>

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 **THREE** printed pages

SECTION A (COMPULSORY)

Question 1

a) For the beam shown in figure 1, derive three moments theorem, when supports A and C settle due to applied forces   (23 marks)

Fig. 1

b) State the **FOUR** basic steps in moment distribution   (7 marks)

SECTION B (Answer any TWO questions from this section)

Question 2

a) The beam shown in figure 2 is fixed at support A and simply supported at B and C. Using three moments theorem, determine the moments along the beam, reactions at supports. Sketch the bending moment and shear force diagrams. I is constant   (20 marks)

C

Question 3

The continuous beam ABC in figure 3 is fully encastre at A and C and simply supported at B. The three supports are at the same level. I is constant throughout. Calculate the support moments using moment distribution and sketch the shear force and bending moment diagrams.   (20 marks)

80KN

Question 4

Using moment distribution sketch the bending moment and shear force diagrams in figure 4. I is constant throughout. (20 marks)

4m

Question 5

Using moment distribution method, analyze the portal frame shown in figure 5 and sketch the bending moment diagram. (20 marks)

Fig. 5