



# 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**

## **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 **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