THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

((A Constituent College of JKUAT)
(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN CIVIL ENGINEERING (DC 10B)

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBC 10B)

EBC 2301: THEORY OF STRUCTURES III

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 2012
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consists of **FIVE** questions
Answer question any **THREE** questions
Maximum marks for each part of a question are clearly shown
This paper consists of **THREE** printed pages

Question One (20 marks)

a) A portal frame ABCD shown in figure 1 is loaded with a uniformly distributed load of 2000kg/m on the horizontal member. The moment of inertia of member AB = CD = I and of member BC = 3I

Fig. 1

Find the support reactions and bending moment in the frame by moment distribution method and draw the bending moment diagram (make 5 dist.) **(20 marks)**

Question Two (20 marks)

a) A continuous beam ABCDE, with uniform flexural rigidity throughout has rollers supports at B, C and D a built-n support at E and an overhang AB as shown in figure 2.

8t

It carries a uniformly distributed load of intensity of 2t/m on AB and another of intensity of 3t/m over BCDE. In addition to it, a point load 8 tonnes is placed mid-way between C and D. The span lengths are AB = 1m, BC = CD = DE = 5m. Obtain the support moments by the moment distribution method and sketch BMD giving values at salient points. **(20 marks)**

Question Three (20 marks)

Using the three moment theorem, analyze the beam shown in figure 3 and hence sketch the shearing force and bending moment diagrams indicating the values at all critical points. **(20 marks)**

C

Question Four (20 marks)

Using the three moment theorem, evaluate the bending moment and shear force diagrams of the beam shown in figure 4. **(20 marks)**

6m

Question Five (20 marks)

A continuous beam ABC of uniform section, with span AB as 8m and BC as 6m, is fixed at A and simply supported at B and C. The beam is carrying a uniformly distributed load of 1KN/m throughout its length. Find the moments along the beam and the reactions at supports. Also draw the BMD. **(20 marks)**

B