



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)

С

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)