THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBC 10B)

DIPLOMA IN CIVIL ENGINEERING (DC 10B)

DIPLOMA IN ARCHITECTURE (DA 10B)

EBC 2212: THEORY OF STRUCTURES II

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 (30 marks)

a) State the first and second Mohr's Theorem and give their mathematical expressions (6 marks)
b) Figure 1. Shows a simple beam supported at point A and B acted on by two moving points loads 1.0 apart.
   (i) Sketch the influence line diagrams for RA, RB, shear force and bending moment at point E on the beam.

   (ii) Determine the maximum shear force and bending moment at point E on the beam (24 marks)

R_A

SECTION B (Answer any TWO questions from this section)

Question 2 (20 marks)

A simply supported beam has a span of 20m. A uniformly distributed load of 20KN/m and 5m long, crosses the span. Find the maximum bending moment produced at a point 8m from the left support. (20 marks)

Question 3 (20 marks)

A cantilever 12cm wide and 20cm deep is 2.5m long. What uniformly distributed load should the beam carry to produce a deflection of 0.5cm at the free end? Take E= 2X 10kg/cm^2 (20 marks)

Question 4 (20 marks)

Using Macaulay's method, determine deflection at mid-span for figure 2 below. (20 marks)

100KN

Question 5 (20 marks)

Using influence lines, determine the maximum bending moment at a point 20m from the left hand support of the girder shown in figure 3 when the loads move from A to B (20 marks)

Fig. 3