THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**DIPLOMA IN CIVIL ENGINEERING WITH COMPUTER AIDED DESIGN
DIPLOMA IN BUILDING & CIVIL ENGINEERING**

EBC 2303: REINFORCED CONCRETE & MASONARY DESIGN

END OF SEMESTER EXAMINATION

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

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

This paper consists of **FIVE** questions in **TWO** sections **A** & **B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

Question 1

a) Outline the process of structural design

b) The floor of a classroom block 6.0m by 15.0m is supported on five reinforced concrete beams equally spaced at 3.0m centres and monolithically casted together. The beams are in turn supported on reinforced concrete columns. Design the slab given the following information

   - Imposed load on floor = $2.5kn/m^2$ on floor
   - 20m thick screed in upper side of slab
   - 15m thick sacred in the lower-side of slab
   - Pvc floor tiles of weight = 0.35 kg/m^3
   - Density of screed = $18KN/m^3$
   - Density of concrete = $24KN/m^3$ (30 marks)

SECTION B (Answer *any TWO questions from this section*)

Question 2

Design typical T-beam in question 1(b) above, including shear reinforcement   (20 marks)

Question 3

A short square reinforced concrete column is required to transmit an axial load of 500KN to a square base. Design the base for bending and check for local bond and shear   (11 marks)

Question 4

Design the T-beam B/1-2 shown in figure 1   (11 marks)

Data

Live load on floor	=	$3.0KN/m^2$
Finishes	=	$1.0KN/m^2$
Slab thickness	=	150mm
Support moments	=	$-WI^2/12$
Span moments	=	$WI^2/24$

Question 5

Figure *2* shows a section through a pre-cast concrete floor. Design an internal beam given the following information

- Density of concrete is = $24KN/m^3$
- Live load on floor = $3.0KN/m^2$
- Clear span = 4.0m
- Finishes = $1.0KN/m^2$
- Bearing in walls = 200mm