



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN CONSTRUCTION
DIPLOMA IN CIVIL ENGINEERING
DIPLOMA IN ARCHITECTURE

EBC 2303 : REINFORCED CONCRETE DESIGN

SPECIAL/SUPPLEMENTARY EXAMINATIONS

SERIES: MAY, 2011

TIME: 2 HOURS

Instructions to Candidates:

This paper consists of **FIVE** questions.

Answer Question **ONE** (Compulsory) and any other **TWO** Questions.

COMPULSORY (30 MARKS)

Question ONE

- (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 = 0.35kg/m^3
 - Density of screed = 18KN/m^3
 - Density of concrete = 24KN/m^3

(30 Marks)

ANSWER ANY TWO QUESTIONS FROM THIS SECTION (20 MARKS)

Question TWO

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

Question THREE

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 FOUR

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 FIVE

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

- Density of concrete is 24KN/m³
- Live load on floor = 3.0KN/m²
- Clear span = 4.0m
- Finishes = 1.0KN/m²
- Bearing in walls = 200mm