THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN ARCHITECTURE (DA 10A)
DIPLOMA IN CIVIL ENGINEERING (DC 10 A)
DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBC 10A)

EBC 2302: REINFORCED CONCRETE & MASONRY DESIGN

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

SECTION A (COMPULSORY)

Question 1

a) Outline the process of structural design (5 marks)

b) The floor of a classroom block 6.5m by 12.0m consists of FIVE reinforcement concrete beams equally spaced at 3.0m centres and monolithically casted together with the supporting beams. 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
   - 20m thick screed on upper side of slab
   - 15mm thick screed on lower side of slab
   - PVC floor tiles of weight = 0.35kg/km^2
   - Density of concrete = 24 KN/m^3
   - Density of screed = 18 KN/m3
   - Pst = 210 N/mm^2
   - Pcb = 7N/mm^2 (20 marks)

c) Sketch a section through the shorter span to show the arrangement of reinforcement (5 marks)

SECTION B (Answer any TWO questions from this section)

Question 2

a) Figure 1 shows a plan of an office block. Design panel 'A' of the slab (15 marks)

b) Sketch a section the shorter span to show the arrangement of reinforcement (5 marks)

Fig. 1

Pst = 230N/mm^2
Pcb = 7 N/mm^2
Imposed load on floor = 3.0 KN/m^2
Finished on floor = 0.7KN/m^2
Density of concrete = 24KN/M^3

Question 3

A floor of a hall of clear spans 3.0m by 7.0m is supported on 200mm thick block walls on all its four sides

a) Design the slab (15 marks)

b) Sketch a section through the shorter side of the slab to show the arrangement of reinforcement (5 marks)

Data:

Pst = 210N/mm^2
Pcb = 7 N/mm^2
Finishers = 2.5KN/m^2
Imposed load = 2.5KN/m^2
Density of concrete = 24KN/m^3

Question 4

a) State factors governing the process of structural design (6 marks)
b) Design typical T-beam in question 1(b) (14 marks)

Question 5

a) Define design loads (6 marks)
b) Design typical L-beam in question 1(b) (14 marks)