TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING

EBC 3203: REINFORCED CONCRETE & MASONRY & DESIGN

END OF SEMESTER EXAMINATION
SERIES: APRIL 2013
TIME ALLOWED: 2 HOURS

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

This paper consists of **FIVE** questions.
 Answer any **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One

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

b) The flow of a classroom block 6.5 x 15.0m consists of six beams equally spaced at 3.0 centres and monolithically casted together. The beams are in turn supported on reinforced concrete columns.

Design the slab:
Data:
- Imposed load = $215KN/m^2$
- 20mm thick screed on upper side of slab
- 15mm thick screed on lower side of slab
- Density of screed = $18KN/m^3$
- Density of concrete = $24KN/m^3$
- PVC floor tiles of weight = $0.15kg/m^2$
- Pst = $0.15kg/m^2$

Question Two

a) Figure 1 shows a plan of a office block. Design slab panel "X:

b) Sketch a section through the shorter span showing the arrangement of reinforcement. **(20 marks)**

4.0m

Data:

- Imposed load   = $3.0KN/m^2$
- Density of concrete   = $24KN/m^3$
- Finishes   = $0.7KN/m^2$
- Pst   = $230N/mm^2$

Question Three

The floor of a hall of clear spans 3.0m by 7.5m is supported on 200mm thick block walls on all its four sides.

a) Design the slab
b) Sketch a section through the shorter span to show the arrangement of reinforcement.

(20 marks)

Data:

- Pst   = $230N/mm^2$
- Density of concrete   = $24KN/m^3$
- Finished   = $0.6KN/m^2$
- Imposed load   = $3.0KN/m^2$

Question Four

a) State factors governing structural design

b) Design T-beam in question 1(b) **(20 marks)**

Question Five

Design typical L-beam in question 1 (b) **(20 marks)**