



TECHNICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE & DARC 13S)

EBC 2209: REINFORCED CONCRETE & MASONRY DESIGN

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2015**

**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 of the **FIVE** questions

Maximum marks for each part of a question are as shown

Use neat, large and well labeled diagrams where required

This paper consists of **TWO** printed pages

### Question One

- a) Define the following:
- (i) One-way spanning slab
  - (ii) Two-way spanning slab
- (4 marks)**
- b) Design slab of a room of clear spans 4.0m by 5.0m supported on 200mm thick block walls on all its four sides:
- Data:
- 25mm thick screed on upper side of slab
  - 20mm thick screed lower side of slab
  - PVC floor tiles of weight =  $0.4\text{kg/m}^2$
  - Density of concrete =  $24\text{KN/m}^3$
  - Density of screed =  $18\text{KN/m}^3$
  - Imposed load on floor =  $3.0\text{KN/m}^2$
- (16 marks)**

### Question Two

The floor of a classroom block 6.5m by 15.0m is supported on six r.c beams and monolithically casted together. Design the slab.

Data:

- Centre to centre of beams = 3.0m
  - Imposed load on floor =  $2.5\text{K/m}^2$
  - Density of concrete =  $24\text{KN/m}^3$
- (20 marks)**

### Question Three

Design typical T-beam in question two. Assume the same information

**(20 marks)**

### Question Four

- a) Define the following:
- (i) Actual length of column
  - (ii) Effective length of column
- (4 marks)**
- b) A 300mm by 300mm r.c column is required to transmit an axial load of 400KN on the square base. Design the column and column base
- (16 marks)**

### Question Five

- a) State the factors governing structural design.
- b) A floor of a hall 3.0m by 7.5m is supported on 200mm thick coral blocks on all its four sides. Design the slab and sketch a section through the shorter span to show the arrangement of reinforcement.
- Data:
- Density of concrete =  $24\text{KN/m}^3$
  - Imposed load on floor =  $2.5\text{KN/m}^2$

- Finishes on floor  $0.6\text{KN/m}^2$