THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN BUIDLING & CIVIL ENGINEERING

EBC 3133: CONSTRUCTION TECHNOLOGY & SERVICES I

END OF SEMESTER EXAMINATION

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Calculator*
- *Drawing instruments*

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 **FOUR** printed pages

SECTION A (COMPULSORY)

Question 1

a) When planning a site layout plan, the contractor must consider, amongst others, the following preliminary items:

(i) Access to the site
(ii) Access on the site
(iii) Site offices
(iv) Adjoining properties
(v) Security of the site
(vi) Storage of materials
(vii) Safety on site

State any **TWO** factors to be considered in any **THREE** of the above items (6 marks)

b) Briefly explain the following concepts of construction stating the suitability of each:

(i) Framed construction
(ii) Load bearing wall construction (6 marks)

c) Briefly explain the following functional requirements of a building structure.

(i) Strength
(ii) Stability (6 marks)

d) With the aid of a sketch, outline the procedure for setting out column positions in a framed structure using a theodolite (6 marks)

e) (i) Briefly state the **THREE** Building Code requirements for foundations of building structures

(ii) With the aid of sketches, differentiate between End Bearing Piles and Friction Piles (6 marks)

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

Question 2

a) (i) With the aid of a sketch illustrate the Sump Pumbing method of dewatering

(ii) Briefly explain the uses of any **THREE** of the following construction materials

- Aggregates
- Cement
- Steel
- Plastics (7½ marks)

b) (i) With the aid of sketches, describe the 'Test Loading' method of determining the ultimate bearing capacity of a pile foundation

(ii) With the aid of sketches, illustrate the following types of foundations:

- Beam and slab foundation
- Cellular raft foundation (9 marks)

c) With the aid of sketches, describe the "Battered Sides" method of basement excavation (3 ½ marks)

Question 3

a) (i) Briefly outline the procedure for approval of building plans by local authorities in Kenya

(iii) The following are inspection notices that a contractor forwarded to a local authority:

- The foundation bed
- The foundation concrete
- The damp-proof course
- The reinforcement placed

Briefly explain the aspects that would be checked in any **THREE** of the above cases (9 marks)

b) (i) Describe any **THREE** items involved in site clearance

(ii) Explain the term 'integral tanking' as applied to basement construction. (4½ marks)

c) Outline the concept of using bentonite slurry in the construction of a diaphragm wall in a deep basement (6½ marks)

Question 4

a) (i) With the aid of a sketch, illustrate timbering to sides of wide excavations in firm soils, not exceeding 3.0m deep.

(ii) State **THREE** factors to be considered when designing a retaining wall (8 marks)

b) (i) State any **THREE** reasons that would necessitate drainage of a site.

(ii) Briefly describe the process of land drainage (7 marks)

c) State **FIVE** common causes of foundation failure (5 marks)

Question 5

a) (i) State any **FOUR** items of information required before dewatering

(ii) With the aid of sketches describe **THREE** methods of leveling a sloping site (11½ marks)

b) (i) With the aid of a sketches, illustrate the difference between a contraction joint and a construction joint suitable to a basement wall.

(ii) Differentiate between the terms internal tanking and external tanking as applied to water proofing of basements. (8½ marks)