



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

DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
**DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBC 13J)**

ECV 2203: CIVIL ENGINEERING CONSTRUCTION I

**END OF SEMESTER EXAMINATION**  
SERIES: DECEMBER 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 **TWO** printed pages

### **Question One**

- a) State the **TWO** functional requirements of foundations **(4 marks)**
- b) With the aid of sketches, explain the **TWO** methods by which the load from the pile may be transmitted into the soil. **(10 marks)**
- c) State **THREE** reasons for underpinning **(6 marks)**

### **Question Two**

- a) (i) Sketch and label a cantilever with a large toe.  
(ii) State **THREE** advantages and **THREE** disadvantages of the retaining wall in (a) (i) above **(12 marks)**
- b) State the **FOUR** design principles of retaining walls **(8 marks)**

### **Question Three**

- a) (i) Sketch and label a Pneumatic Caisson.  
(ii) State **FOUR** advantages of the Caisson in a(i) above **(11 marks)**
- b) (i) Briefly describe Monolith Caissons  
(ii) State the application of the structures in b(i) above **(5 marks)**
- c) Briefly explain sand blowing defect in Caissons **(4 marks)**

### **Question Four**

- a) Explain the **THREE** failure modes for Gravity cofferdams **(6 marks)**
- b) (i) Sketch a section through a cellular sheet piling  
(ii) Sketch a plan of cellular sheet piling **(4 marks)**
- c) Outline **FOUR** factors to be considered in design of double-wall cofferdams **(8 marks)**
- d) Define the term cofferdam **(2 marks)**

### **Question Five**

- a) Explain the term labour based construction **(2 marks)**
- b) Outline the **FIVE** benefits of labour-based construction **(10 marks)**
- c) With aid of sketch, describe the construction of Counterfort retaining walls **(8 marks)**