



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS**

**2013/2014 ACADEMIC YEAR**

**SECOND YEAR, FIRST SEMESTER FOR THE DEGREE OF BACHELOR OF  
SCIENCE IN CONSTRUCTION MANAGEMENT**

**FIRST YEAR, FIRST SEMESTER FOR THE DEGREE OF BACHELOR OF SCIENCE  
IN CONSTRUCTION MANAGEMENT**

**TCM- 3216 CIVIL ENGINEERING CONSTRUCTION I**

**August 2013**

**TIME: 2 HOURS**

**INSTRUCTIONS**

This paper consists of 5 questions

Answer Question ONE and any other TWO Questions

## QUESTION 1

- a) With the aid of diagrams describe the following elements of the built environment.
- i. Elements of the natural environment (3mks)
  - ii. External elements of the built environment (3mks)
  - iii. Internal elements of the built environment (3mks)
- b) As a project manager in a busy construction firm, you have been asked to approve a list of construction equipments that the contractor proposes to buy for the construction of a ten storey commercial block.
- i. What factors will you consider while approving the equipments? (5mks)
  - ii. Name at least five possible equipments that you would approve from the submitted list and state their relevance to the enlisted works. (5mks)
- c) Discuss the concept of ‘complementarity’ as applied to properties of reinforced concrete components. (6mks)
- d) List the main advantages of using precast concrete frames in civil engineering construction. (5mks)

## QUESTION 2

- a) Discuss the main structural steel elements that form part of a steel frame building. (5mks)
- b) Outline the four main steps in a structural design concept. (4mks)
- c) Describe three theories that form the basis of structural steel design. (6mks)
- d) Explain the concept of fire protection in structural steel works and illustrate the typical methods employed in a 2 Hour fire resistance design. (5mks)

## QUESTION 3

As an officer in charge of the concrete works in the construction of a Hydropower station, you have been tasked with the responsibility of developing a method statement of works for the construction of powerhouse suspended RCC slab.

- a) Outline the four main construction sequences that will constitute the main elements of your method statement of works. (4mks)

- b) With the aid of diagrams provide typical RCC details of a continuous beam that may form part of the monolithic beam-slab construction. (8mks)
- c) What justifications will you give for providing sufficient cover to reinforcement? (2mks)
- d) Using illustrations explain the concept of composite action in a singly reinforced simply supported beam. (6mks)

#### **QUESTION 4**

- a) With the aid of a diagram briefly discuss the role of foundations in buildings. (5mks)
- b) Outline the conditions that affect the choice of the correct type of foundation to employ in buildings. (6mks)
- c) Discuss the main factors that may lead to foundation failure in civil engineering constructions. (9mks)

#### **QUESTION 5**

- a) Using illustrations explain the following elements in relation to dam construction.
- i. Crest
  - ii. Parapet walls
  - iii. Spillway
  - iv. Abutments
  - v. Freeboard (10mks)
- b) Based on structure and design briefly describe three common types of dams. (6mks)
- c) Outline four main steps in the construction of a dam for intake water works. (4mks)