



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**

TCM- 3213 MATERIAL SCIENCE II

August 2013

TIME: 2 HOUR

INSTRUCTIONS

This paper consists of 5 questions

Answer Question ONE and any other TWO Questions

QUESTION ONE

- a) Compare and contrast **THREE** advantages and **THREE** disadvantages of timber as construction material.
(6 Marks)
- b) State any **THREE** reasons why steel has found more application in construction in the industry recent past compared to iron.
(6 Marks)
- c) Discuss any **TWO** general characteristics of bituminous materials.
(6 Marks)
- d) State any **SIX** properties of plastics which makes them popular as a construction material
(6 Marks)
- e) State **SIX** factors you would consider when selecting a material for use in construction job.
(6 marks)

QUESTION TWO

- a) Discuss any **FIVE** factors which affect strength of timber
(10 Marks)
- b) State any **FIVE** reasons for seasoning of Timber
(5 Marks)
- c) State **FIVE** reasons why wood products are becoming more popular in construction industry
(5 Marks)

QUESTION THREE

- a) State any **FIVE** reasons for use of steel reinforcement in building and civil construction works
(5 marks)
- b) State **FIVE** reasons of alloying in steel
(5Marks)
- c) Compare and contrast any **THREE** properties of aluminium and copper as building construction materials, explaining areas of applications
(10 Marks)

QUESTION FOUR

- a) Distinguish the following types of bituminous materials used in pavement construction
- i. straight-run asphalt
 - ii. cutback asphalts
 - iii. asphalt emulsions
- (9 Marks)
- b) Explain the procedure and significance of the following quality control tests in bitumen
- i. penetration
 - ii. flash point

(8 Marks)

- c) State any two precautions concerning health, safety and environmental aspects of bituminous materials

(3 Marks)

QUESTION FIVE

- (a) List SIX constituents of plastic product and state the function of each constituent in the general property of plastic

(12 Marks)

- (b) Explain the fundamental difference between thermoplastics and thermosetting plastics

(5 Marks)

- (c) State any THREE limitations of plastics as a building material

(3 Marks)