



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF ENGINEERING AND TECHNOLOGY
UNIVERSITY EXAMINATIONS FOR THE DEGREE OF SCIENCE IN:
BUILDING CONSTRUCTION AND MANAGEMENT
2ND YEAR 1ST SEMESTER 2015/2016 ACADEMIC YEAR
CENTRE: MAIN CAMPUS**

COURSE CODE: TCM 3213

COURSE TITLE: MATERIAL SCIENCE II

EXAM VENUE: W/S

STREAM: BSc IN CONSTRUCTION

DATE: 26/4/16

EXAM SESSION: 9.00 – 11.00 AM

TIME: 2 HOURS

Instructions

- 1. Answer Question 1 (compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE

- a) State SIX factors you would consider when selecting a material for use in construction project.
(6 marks)
- b) Describe any TWO methods of timber conversion.
(6 Marks)
- c) State any THREE general characteristics of wrought iron.
(6 Marks)
- d) State THREE general characteristics of tar.
(6 Marks)
- e) Define the term plastic and state FIVE of its limitations as a construction material
(6 Marks)

QUESTION TWO

- a) State any THREE advantages and any THREE disadvantages of timber as a building material.
(6 Marks)
- b) Explain how the following factors affect the strength of timber
- i. Moisture content
 - ii. Slope of grain
 - iii. Presence of knots
- (9 Marks)
- c) State any FIVE reasons for seasoning of timber
(5 Marks)

QUESTION THREE

- a) Describe the manufacturing process of steel and state any three of their applications in construction industry.
(6 marks)
- b) State any TWO property improvements achieved by alloying steel with the following:
- i. Nickel
 - ii. Chromium
- (4Marks)
- c) State any FIVE precautionary measures against corrosion of metals
(5 Marks)
- d) State any FIVE properties of aluminium which make it popular as a construction material
(5 Marks)

QUESTION FOUR

- a) Explain the manufacturing process of the following types of bitumen
- 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. Ring and ball test
 - ii. Solubility test

(8 Marks)

- c) State any two bitumen emulsion safety handling procedures

(3 Marks)

QUESTION FIVE

- (a) List any THREE constituents of plastic product and explain how the listed constituents affect general property of plastic

(9 Marks)

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

(5 Marks)

- (c) State any SIX advantages of plastics as a building material

(6 Marks)