



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

**UNIVERSITY EXAMINATION FOR THE DEGREE IN SCIENCE IN
CONSTRUCTION MANAGEMENT**

2ND YEAR 1ST SEMESTER 2023/2024 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TCB 1205

COURSE TITLE: MATERIAL SCIENCE II

EXAM VENUE:

STREAM: BSc. CONSTRUCTION MGT

DATE: /12/2023

EXAM SESSION:

DURATION: 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 (30 Marks)

- a) Compare and contrast any **THREE** advantages and any **THREE** disadvantages of Timber as a construction material. (12 Marks)
- b) State any **FOUR** advantages of steel as a structural material. (6 Marks)
- c) State any **FOUR** property changes in metals attributed to alloying elements. (6 Marks)
- d) Define bituminous materials and **TWO** major characteristics of bituminous materials. (6 Marks)

QUESTION TWO (20 Marks)

- a) In reference to mechanical strength properties of timber, explain orthotropic nature of timber. (3 Marks)
- b) Explain any **THREE** factors which affect strength of structural timber. (9 Marks)
- c) Discuss the significance of timber seasoning and timber preservation. (8 Marks)

QUESTION THREE (20 Marks)

- a) Distinguish between wrought iron and mild steel. (8 marks)
- b) List any **FOUR** precautions a construction manager would take to reduce corrosion effect in metals. (6 Marks)
- c) State any **THREE** properties of aluminium which make it popular as a construction material and also state any **THREE** areas of its application in construction industry. (6 Marks)

QUESTION FOUR (20 Marks)

- a) Explain **THREE** types of cut-back asphalt (6 Marks)
- b) Explain the procedure and significance of the following quality control tests in bitumen
 - i. Penetration test
 - ii. Flash point test(8 Marks)
- c) State any **FOUR** bitumen safety handling procedures (6 Marks)

QUESTION FIVE (20 Marks)

- (a) List any **THREE** constituents of plastic product and explain how the listed constituents affect general property of plastic (9 Mark)
- (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)