



MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 210: CIVIL ENGINEERING MATERIALS II

DATE: 19/6/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

- *This paper comprises five questions*
- *Answer question number one and any other two questions*
- *All the optional questions carry equal marks*
- *Candidates to have relevant design manuals*

QUESTION ONE (COMPULSOORY) (30 MARKS)

- a) Name the following:
- i The seven ceramic processing steps (7 marks)
 - ii A molten metal that catches fire in chlorine gas and gives off white fumes (2 marks)
 - iii A metal that forms two types of oxides and rusts in moisture; write the chemical formula of the oxide. (2 marks)
 - iv A metal used in long distance cables wires (2 marks)
- b) Define the following metal properties
- i Malleability (1 mark)
 - ii Hardness (1 mark)
 - iii Fusibility (1 mark)
 - iv Ductility (1 mark)

- c) Explain the difference between Wrought iron, Cast iron and Pig iron (5 marks)
- d) Name three (3) forms of cathode protection (3 marks)
- e) Name three (3) physical properties of dried wood. (3 marks)
- f) Name two (2) methods used to make timber a fire resistant material (2 marks)

QUESTION TWO (20 MARKS)

The major advantages of using aluminium are tied directly to it's remarkable properties.

- a) List five (5) such properties. (5 marks)
- b) Describe each of the five (5) properties in i) above (15 marks)

QUESTION THREE (20 MARKS)

Describe the process for manufacture of steel. (20 marks)

QUESTION FOUR (20 MARKS)

- a) List the three steps in the three-step process to increase strength of aluminum alloys by heat treatment. (3 marks)
- b) Describe the three-step process in i) above (17 marks)

QUESTION FIVE (20 MARKS)

- a) Define the term seasoning of wood. (2 marks)
- b) List and explain 6 (six) advantages of wood seasoning process (18 marks)