



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR SPECIAL / SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (CIVIL ENGINEERING)

ECV 210: CIVIL ENGINEERING MATERIALS II

DATE: 30/8/2022

TIME: 11.00-1.00 PM

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## INSTRUCTIONS:

- *This paper comprises of FIVE questions. Answer **THREE** questions*
- *Question one is **compulsory** and carry 30 marks*
- *Answer any other **TWO** questions*

## QUESTION ONE (30 MARKS)

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|----|---|-----------|
| a) | State the properties of aluminum as a structural material                       | (3 Marks) |
| b) | Describe three uses of cast aluminum alloys                                     | (3 Marks) |
| c) | Explain any three chemical properties of metals                                 | (3 Marks) |
| d) | What are the main causes of defects in wood and timber products                 | (2 Marks) |
| e) | State the factors that affect the strength properties of wood                   | (4 Marks) |
| f) | List the different types of polymers according to their applications            | (3 Marks) |
| g) | State the factors affecting the properties of polymers                          | (2 Marks) |
| h) | list and explain the different types of ceramics                                | (4 Marks) |
| i) | Describe the properties of ceramics that makes them viable structural materials | (3 Marks) |
| j) | What are Composite Materials and their Classification?                          | (3 Marks) |

## QUESTION TWO (20 MARKS)

- |    |  |            |
|----|--|------------|
| a) | List and describe the defects in timber that occurs during seasoning | (8 Marks)  |
| b) | Discuss different methods of wood preservation                       | (12 Marks) |

**QUESTION THREE (20 MARKS)**

- a) Explain the different types of corrosion in metals. (10 Marks)
- b) Discuss the different methods of combating corrosion in metals (10 Marks)

**QUESTION FOUR (20 MARKS)**

- a) List the raw materials that are charged in the blast furnace during iron making and their functions (8 Marks)
- b) Discuss the importance of requirements for different alternative routes in iron making (4 marks)
- c) Describe the alternative iron making methods that exists (8 Marks)

**QUESTION FIVE (20 MARKS)**

- a) List and explain the qualities of a good timber (10 Marks)
- b) State the importance of seasoning wood (3 Marks)
- c) Discuss the different ways of seasoning timber (7 Marks)

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