



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CIVIL ENGINEERING)

ECV 205: CIVIL ENGINEERING MATERIALS I

DATE: 15/12/2021

TIME: 8:30 – 10:30 AM

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 (COMPULSORY) (30 MARKS)

- Discuss FIVE different desirable characteristics of aggregate used in portland cement concrete (15 marks)
- Give FIVE sources of cement in Kenya (10 marks)
- What is the role of gypsum in the production of portland cement (1 mark)
- Define FOUR areas where mortar is commonly used (4 marks)

QUESTION TWO (20 MARKS)

- Describe the Process used in manufacture of Portland Cement (12 marks)
- Describe the distinct operations applied in the manufacture of bricks (8 marks)

QUESTION THREE (20 MARKS)

- Describe the methods used for evaluating the strength and supporting power of a Subgrade (4 marks)
- Describe in details the TWO methods used in Soil classification (12 marks)
- State the FOUR control factors that affect the extent of compaction (4 marks)

QUESTION FOUR (20 MARKS)

- What are Cement Additives. (3 marks)
- Give FIVE importance of Cement additives (5 marks)
- State and define SIX common categories of Cement additives (12 marks)

QUESTION FIVE (20 MARKS)

- a) Define the term Aggregate (2 marks)
- b) Discuss the hydration process of Portland Cement. (10 marks)
- c) Describe The FOUR Types of Artificial Aggregates (8 marks)