



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CIVIL ENGINEERING)

ECV 205: CIVIL ENGINEERING MATERIALS I

DATE: 18/8/2021

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 (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)
- Define
 - Fineness of cement
 - Soundness
 - Consistency
 - Strength (8 marks)

QUESTION THREE (20 MARKS)

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

QUESTION FOUR (20 MARKS)

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

QUESTION FIVE (20 MARKS)

- a) Define the term Aggregate (2 marks)
- b) Discuss five different desirable characteristics of aggregate used in Portland cement concrete. (10 marks)
- c) Give FOUR factors considered when choosing aggregates for Portland Cement Concrete (8 marks)

QUESTION SIX (20 MARKS)

- a) Define the following terminologies in reference to concrete technology: -
 - i. Concrete
 - ii. Batching
 - iii. Mixing
 - iv. Curing
 - v. Workability (5 marks)
- b) Give FIVE factors that affect Concrete Workability (5 marks)
- c) Define the term Slump Test (2 marks)
- d) Describe the Slump Test Process in details (8 marks)