



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 205: CIVIL ENGINEERING MATERIALS I

DATE: 24/3/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer question one and any other two questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Name **FOUR** types of cements which are commonly used in the construction industry in the country? (4 marks)
- b) State how the different types of cements are obtained from the most common and popularly used type of cement? (5 marks)
- c) Describe the process of cement manufacture from raw materials to the finished final product ready for the market. (13 marks)
- d) Briefly define what **Pozzolanic cement** is and specify the difference between it and Ordinary Portland cement. (8 marks)

QUESTION TWO (20 MARKS)

- a) Describe what AGGREGATES are stating the different types of aggregates available in the local construction industry? (6 marks)
- b) Explain how **Shape** and **Surface texture** of aggregates can affect the end product of the resulting concrete produced from such aggregates. (7 marks)

- c) Name **Four** grading zones which fine aggregates are required to conform to so as to be able to satisfy the required standard for use? (7 marks)

QUESTION THREE (20 MARKS)

- a) What do you understand by the term **concrete** and briefly state all the materials which are used in the production of concrete. (7 marks)
- b) State **five factors** which can lead to influencing the final strength of concrete? (6 marks)
- c) Describe how concrete is prepared to minimize chances of production of poor quality concrete works? (7 marks)

QUESTION FOUR (20 MARKS)

- a) Define the following terminologies as used in reference to the production of concrete; (i) Bleeding. (ii) Segregations. (iii) Honey combing. (6 marks)
- b) State **three** types of shapes used for the making of concrete for the determination of compressive strengths of the resulting concrete product? (6 marks)
- c) List **four** factors and give a brief explanation on how these factors can lead to movement in concrete due to the effect of temperature, moisture and loading. (8 marks)

QUESTION FIVE (20 MARKS)

- a) Define the term Durability as commonly used in association with concrete works? (6 marks)
- b) Explain causes which can lead to concrete not being durable stating an example of each of the causes? (6 marks)
- c) Briefly explain what you understand by the terms **Permeability** and **Absorption** with regard to concrete and state how it can be reduced? (8 marks)