# MACHAKOS UNIVERSITY

**University Examinations for 2020/2021Academic 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)