MACHAKOS UNIVERSITY.

University Examinations 2019/2020

SCHOOL OF CIVIL ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SUPPLIMENTARY EXAMINATION FOR BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 205: CIVIL ENGINEERING MATERIALS I

DATE: **TIME:**

INSTRUCTIONS: Attempt questions **ONE** and any other **TWO** questions.

QUESTION No.1 (compulsory) *(30 marks)*

(a) Name **FOUR** types of commonly used locally produced cements. *(4marks)*

(b) State how the four different types of cements as stated in (a) above are obtained *(5marks)*

(c) Briefly define what **Pozzolanic cement** is and state the difference between it and **Ordinary Portland cement.** *(8 marks)*

(d) Describe the process of cement manufacture from raw materials to the finished final product ready for the market. *(13 marks)*

QUESTION No. 2 *(20 marks)*

(a) Describe what **aggregates** are stating the different types of aggregates available in the local construction industry? *(6 marks)*

(b) Name at least four characteristics of aggregates that must be considered when specifying the materials for construction works. *(7 marks)*

(c) Briefly explain how each of the above named characteristics can affect the end product of the resulting concrete produced from such aggregates. *(7 marks)*

QUESTION No. 3. *(20 marks)*

(a) Briefly state what you understand by the term **concrete** and list at least four ingredients of a concrete mix. *(6marks)*

(b) List and briefly describe at least **five factors** which can influence the final strength of concrete? *(7 marks)*

(c) Describe how concrete is prepared for small construction works in a construction site located in a remote area to minimize/eliminate chances of production of poor quality concrete works?

(7 marks)

QUESTION No.4 *(20 marks)*

(a) State **three** types of shapes used for the making of concrete for the determination of compressive strengths of the resulting concrete product? *(4 marks)*

(b) Define and briefly explain the causes of the following occurrences as sometimes witnessed in the manufacture of concrete and how they can be minimized/eliminated during production and placing of concrete; (i) Bleeding. (ii) Segregations. (iii) Honey combing. *(8 marks)*

(c) List **four** factors affecting workability and give a brief explanation on how these factors can lead to movement in concrete due to the effect of (i) Temperature, (ii) Moisture and (iii) Loading. *(8 marks)*

QUESTION No.5 *(20 marks)*

(a) Briefly state what can cause concrete not to be **Durable** giving at least two of the causes and how they can be prevented or minimized. *(5marks)*

(b) Briefly explain what you understand by the terms **Permeability** and **Absorption** with regard to concrete and state how it can be reduced? *(5 marks)*

(c) The term workability is commonly used in reference to fresh concrete. Explain what you understand by the term and state at least three factors which can affect concrete workability with a brief explanation on how each of these factors can affect the concrete.

(10 marks)