JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMIMATION FOR THE DEGREE IN SCIENCE IN CONSTRUCTION MANAGEMENT

2nd YEAR 1st SEMESTER 2021/2022 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TCB 1201

COURSE TITLE: SOIL MECHANICS

EXAM VENUE: STREAM: BSc. CONSTRUCTION MGT

DURATION: 2 HOURS

Instructions

1. **Answer question 1 (Compulsory) and ANY other two questions**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE (30 Marks)

(a) Name and describe a Single Grained Structure?

(6 Marks)

(b) Describe the process of soil formation form the parent rock?

(6 Marks).

(c) In general, there are two major categories into which the classification systems can be grouped. Briefly name and describe the TWO?

(6 Marks).

(d) Explain the capillary action on sand phenomenon below?

(6 Marks).

(e) The amount by which the ground can shrink and/or swell is determined by various factors. Name THREE?

(6 Marks).

QUESTION TWO (20 Marks)

(a) Classification systems are used to group soils according to their order of performance under given set of physical conditions. Soil may be broadly classified into FOUR. Name and describe these classifications?

(4 Marks).

(b) List and describe THREE stages in the consolidation of soil)?

(6 Marks).

(c) Soil structure is the geometrical arrangement of the solid parts of the soil, therefore, it is important for us to understand the structure of soil deposits. List FOUR of these soil structures

(4 Marks).

(d) List and describe SIX properties of soil that should be taken into consideration while dealing with soil as a construction material?

(6 Marks).

QUESTION THREE (20 Marks)

a. Define Shear Strength of soil and its significance?

(4 Marks).

b. Explain the relationship between Shear Strength, Cohesion and Friction between soil particles?

(6 Marks).

c. List six (6) methods of computing the bearing capacity and explain one of these?

(6 Marks).

d. Describe Mechanical Stabilization?

(4 Marks).

QUESTION FOUR (20 Marks)

a. List SIX design objective required for carrying out site investigations prior project design?

(6 Marks).

b. The structure of the soil is disturbed to the considerable degree by the action of the boring tools or the excavation equipment. The disturbances can be classified in FIVE basic types. List them?

(5 Marks).

c. Retaining walls are generally classified into FIVE types in accordance with shapes, characteristics, design criteria and applications. List them?

(5 Marks).

d. List and describe FOUR causes of retaining wall failure?

(4 marks).

END