JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DIPLOMA IN BUILDING AND CIVIL ENGINEERING

2ND YEAR 2ND SEMESTER 2017/2018 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TBC 2225

COURSE TITLE: SOIL MECHANICS AND FOUNDATION ENGINEERING II

EXAM VENUE: LAB 23 **STREAM: DIP IN BLD & CIV ENG**

DATE: 19/12/2017 **EXAM SESSION: 2.00 – 3.30PM**

DURATION: 1 ½ 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

a) State any FOUR aims soil exploration exercise

(4 Marks)

b) State any FOUR laboratory tests you would wish to carry out on soil sample collected for a site investigation giving reason for carrying out suggested test.

(8 Marks)

c) Describe Standard Penetration Test (SPT).

(8Marks)

QUESTION TWO

a) Mention any TWO engineering applications of retaining walls

(4 Marks)

b) With the aid of need sketches, explain any THREE types of retaining walls

(6 Marks)

c) A retaining wall with vertical back is 5m high. The density of soil fill on the entire height of the wall is $18kN/m^3$ and the angle of friction is 30^0. Water table within retained soil fill corresponds to ground level surface. The wall also experiences a surcharge pressure of $30kN/m^2$. Find the magnitude and point of application of the active thrust on the wall per lineal meter.

(10 Marks)

QUESTION THREE

a) Explain any FIVE circumstances on how water can affect stability of earth slopes

(10 Marks)

b) Explain any FIVE methods for mitigating against failure of slopes.

(10 Marks)

QUESTION FOUR

a) With the aid of neat sketches, illustrate FOUR types of foundations

(8 Marks)

b) Distinguish between safe bearing capacity and allowable bearing capacity

(4 Marks)

c) Suggest any FOUR approaches foundation designers should consider when designing foundations in expansive soils.

(8 Marks)