



MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN CIVIL ENGINEERING

BCECD 312 FOUNDATION ENGINEERING

DATE: 2/5/2019

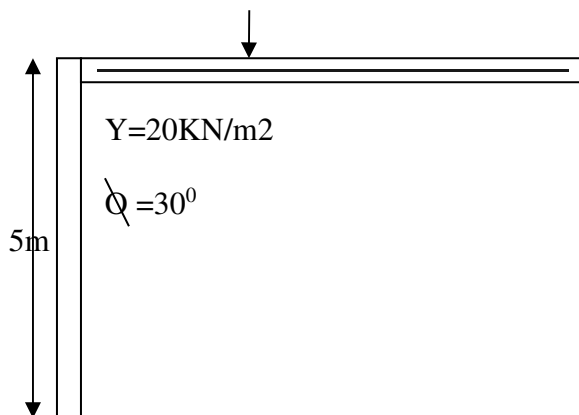
TIME: 8:30 – 10:30 AM

INSTRUCTIONS

i) Question one is compulsory and carries 30mks

ii) Answer Any other Two questions

1. a) Give the three types of earth pressures (3 marks)
- b) Determine the active earth pressure on the frictionless wall shown. Calculate the resultant force and its location from the base of the wall. Neglect seepage effects (10 marks)



- c) A vertical retaining wall 6.1m high supports a cohesionless fill that weighs 18.4 kN/m³. The upper surface of the fill rises above the crest of the wall at an angle of 20° with the horizontal. The angle of internal friction is 28°, and the angle of wall friction is 20°. By the coulomb's method compute the total active earth pressure against the wall. (10 marks)
- d) Describe two types of settlement of foundation (4 marks)
- e) Give three methods used in the determination of ultimate bearing capacity (3 marks)

2. a) Give five assumptions of lateral earth pressure (10 marks)
- b) Calculate the bearing capacity per unit of area of a continuous footing 2.44m wide, supported on a soil which $C=20$ and $O=170$ and $Y=19\text{KN/m}^2$. The load settlement curve resembles C, in Fig. 2. The depth of the foundation is 2m. The water table is at a depth of 5m below the ground surface (10 marks)
3. a) With the aid of diagrams, describe the following earth pressures
- i) Lateral earth pressure
 - ii) Active earth pressure
 - iii) Passive earth pressure (15 marks)
- b) Give five types of retaining walls (5 marks)
4. a) With the aid of a diagram, show the following mohr's circles for:-
- i) At rest earth pressure
 - ii) Active earth pressure
 - iii) Passive earth pressure (10 marks)
- b) With the aid of a diagram, illustrate the variation of active, passive and lateral earth pressure with depth (10 marks)
5. A point load of 24KN acts on the earth surface of elastic mass of very great extent. What is the intensity of vertical pressure, due to the load, at a depth of 1m directly below load, at a depth of 2m, at a depth of 5m. What is the intensity of the vertical pressure at the same depths of a horizontal distance of 1m from the line of action of the point load (20 marks)