# 320652(20)

APR-MAY 2022

## B. E. (Sixth Semester) Examination, ~~2020~~

### (New Scheme)

### (Civil Engg. Branch)

### GEOTECH ENGINEERING–II

*Time Allowed : Three hours*

*Maximum Marks : 80*

*Minimum Pass Marks : 28*

*Note : Attempt all questions. Part (a) of each question is campuslory. Attempt only two parts from (b), (c) and (d).*

### Unit-I

1. (a) What is the difference between total cohesion and mobilized cohesion? 　　　　　　　　　2

(b) Explain stability analysis of infinite slopes for cohesive soil.　7

(c) Explain with sketch the concept of Swedish circle method of analysing of slopes.　7

(d) Give a brief outline on the friction circle method in stability of slopes.　7

## Unit-II

2. (a) Depth of tension cracks in purely cohesive soil is :　2

   (i) $n = \dfrac{4c}{r}$

   (ii) $h = \dfrac{2c}{r} + e$

   (iii) $h = \dfrac{-8c}{r} + e$

   (b) Compute the intensities of active and passive earth pressure at depth of 8 m in dry cohesion less and with an angle of internal friction of 30° and unit weight of 18 kN/m³. What will be the intensities of active and passive earth pressure if the water level

rises to the ground level? Take saturated unit weight of sand as 22 kN/m³.　7

(c) Backfill on retaining wall is cohesionless of density 2.1 g/cc and is of 6.5 m high. The wall slope at an angle 80° to the horizontal and angle of surcharge of the fill is 5°. If the angle of internal friction for the soil is 35° and angle of wall friction is 23°. Find out the total maximum earth pressure by using Rebhann's construction.　7

(d) Explain Culmann's graphical method.　7

## Unit-III

3. (a) Define :　2

   (i) Safe bearing capacity

   (ii) Allowable bearing pressure.

   (b) Explain effect of water table on bearing capacity.　7

   (c) Explain plate load test.　7

   (d) The result of two plate load tests for a settlement of 25.4 mm are given :

   | Plate diameter | 0·305 m | 31 kN |
   |----------------|---------|-------|
   | Load           | 0·61 m  | 65 kN |

A square column foundation is to be designed to carry a load of 800 kN with an allowable settlement of 25·4 mm. Determine the size of footing by using Housel method. 7

## Unit-IV

4. (a) What is caisson? 2

(b) Explain various shapes of well. 7

(c) Explain element of well foundation. 7

(d) In a 16 pile group, the pile diameter is 45 cm and center to center spacing of the square group is 1·5 m If $\dot{C}$ = 50 kN/m$^2$, determine whether the failure would occur with the pile acting individually, or as a group? Neglect bearing at the tip of the pile. All piles are 10 m long. 7
Take m = 0·7 for shear mobilisation around each pile.

## Unit-V

5. (a) What do you mean by CNS soils? 2

(b) What is an expansive soil? Where is an it found in India? What are its generally characteristics. 7

(c) Explain sources of sub soil contamination. 7

(d) Explain effect of sub surface contamination. 7