

To find out modulus of elasticity of the soil a soil sample was stressed to 3.0 kg/cm^2 and strain noted was 0.6%. Find out settlement at centre and edge of the footing. Assume influence factor for centre 1.12 and 0.56 for the corner.

[7]

4. (a) In the under-reamed pile construction, the ratio of shaft diameter to bulb-diameter is

(i) 1/1.5

(ii) 1/2

(iii) 1/2.5

(iv) 1/4

CSVTUonline.com

[2]

- (b) Differentiate between friction pile and end bearing pile. How can the bearing capacity of a pile be estimated?

[7]

- (c) How steining thickness is designed? Explain briefly.

[7]

- (d) What will be the penetration of square RC piles per blow which must be obtained in driving the piles with a 2 tonnes steam hammer falling through 1m? Allowable load is 20 tonnes.

[7]

5. (a) Define expansive soil.

[2]

- (b) Discuss the design considerations for design of a foundation on expansive soil.

[7]

- (c) Discuss the various problems associated with expansive soil and moisture variation.

[7]

- (d) What is soil contamination? Enumerate sources and their remedial measures.

[7]

CSVTUonline.com

320652(20)

BE (6th Semester)

Examination, April-May, 2017

[New Scheme]

Geotech Engineering-II

Time Allowed : 3 hours

Maximum Marks : 80

—CSVTUonline.com—

Minimum Pass Marks : 28

Note : (i) Part (a) of each question is compulsory. Attempt any two parts from (b), (c) and (d) of each question. Use of graph paper is permitted and supplied to students on their demand by the examination centre.

(ii) The figures in the right-hand margin indicate marks.

1. (a) Embankments should have an FOS 1.0 to 1.2 at the end of construction while on earth dam should have factor of safety

(i) more than 2.0

(ii) 1.5 and above

(iii) 1.0 to 1.20

(iv) more than 3.0

[2]

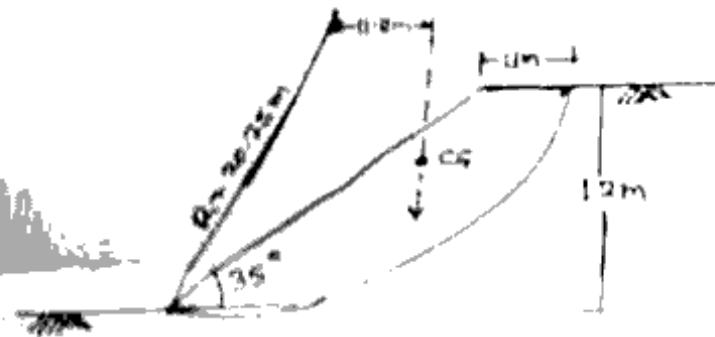
- (b) Discuss the critical conditions for the stability of earth dams.

[7]

CSVTUonline.com

[2]

- (c) Describe the stability analysis of a finite slope using Taylor stability number briefly. [7]
- (d) The slip circle for a cutting has been shown in figure below. Determine the factor of safety with respect to cohesion. Use friction circle method. $c = 21 \text{ kN/m}^2$, $\phi = 15^\circ$, $\gamma = 0.3 \text{ kN/cm}^2$. [7]



2. (a) The angle of wall friction is the angle between [2]
- ϕ and 2ϕ
 - $\phi/2$ and $3\phi/4$
 - $\phi/4$ and $\phi/2$
 - 2ϕ and 3ϕ
- (b) Derive the condition for maximum active earth pressure from a cohesionless soil by using Coulomb's wedge theory. [7]
- (c) In order to estimate the greater height to which a vertical cut can be made without support, a triaxial test was run on a clay soil [7]

The following were the observations:

$\sigma_3 (\text{kg/cm}^2)$	0.35	0.70	1.05	1.40	1.75
$\sigma_1 (\text{kg/cm}^2)$	2.31	3.22	4.35	5.46	6.37

Calculate the height. Assume density of clay as 1760 kg/m^3 . [7]

- (d) The space behind a masonry retaining wall 5 m high is backfilled with a granular soil which has an angle of internal friction equal to 35° . The back of wall is inclined at an angle of 75° to horizontal and the backfill slopes upward from the top of the wall on a slope of 10:1. Assuming angle of wall friction as 10° , calculate the total active earth pressure on the wall per meter length. $G = 2.7$, $w = 21\%$ and $S = 70\%$. [7]

3. (a) Permissible settlement is relatively higher for [2]
- isolated footing on clay
 - isolated footing on sand
 - raft on clay
 - raft on sand
- (b) Compare in tabular format the general shear failure with local shear failure. [7]
- (c) Briefly describe plate load test method for determination of bearing capacity of soil. [7]
- (d) A load of 300 tonnes is being taken by a square column footing of 3 m wide. The footing rests on silty soil which has value of Poisson's ratio 0.3. [7]