

Civil - Geotech Eng

3/3/2020

Total No. of Questions - [6]

Total No. of Printed Pages: 02

G.R. No.

MARCH 2020 INSEM (T1)

S. Y. B. TECH. (Civil Engineering) (SEMESTER - IV)

COURSE NAME: Geotechnical Engineering

COURSE CODE: CVUA22182

(PATTERN 2018)

Time: [1 Hour]

[Max. Marks: 20]

(*) Instructions to candidates:

1. Attempt Q.1 **OR** Q.2, Q.3 **OR** Q.4, Q.5 **OR** Q.6
2. Figures to the right indicate full marks.
3. Use of scientific calculator is allowed.
4. Assume suitable data wherever required.

Q. 1) a) Show change in the volume of soil due to change in the water content for a cohesive soil with neat sketch and define any two Atterberg limits with reference to the same figure. [4] CO-1

b) A saturated clayey sample weighing 1540 gm and weighs 1120 gm after oven drying. If its dry density is known to be 1350 kg/m^3 . (Assume $G=2.74$) [4] CO-1

Find

i) Water content ii) Void ratio iii) Porosity

OR

Q. 2) a) Derive the following relationship - $w G = e \cdot S_r$ [4] CO-1

b) A soil sample taken from a borrow pit has an in situ void ratio of 1.15. The soil is to be used for a compaction project where a total of 100000 m^3 is needed in a compacted state with the void ratio predetermined to be 0.73. Determine how much volume is to be excavated from the borrow pit. [4] CO-1

Q. 3) a) In a falling head permeameter test on a silty clay sample, the following result were obtained: [4] CO-2

Sample length 120 mm, Sample diameter 80 mm, initial head 1200 mm, final head = 400mm, time for fall in head = 6min, stand pipe dia being 4 mm. Find the coefficient of permeability of soil in mm/sec.

b) Explain the factors affecting permeability of soil. [4] CO-2
(minimum 4 points)

OR

- Q. 4) a) With a neat sketch explain "quick sand condition" and derive expression for critical hydraulic gradient. [4] CO-2

b) In order to compute the seepage loss through the foundation of dam, flow net was drawn. The flow-net study gave number of flow channels $N_f = 8$ and no of equipotential drops $N_d = 18$. The head of water lost during seepage was 6 m. If the coefficient of permeability of foundation soil is 4×10^{-5} m/min, Find seepage loss per meter length of dam per day. [4] CO-2

- Q. 5) Differentiate between light weight compaction test and heavy compaction test. [4] CO-3

OR

- Q. 6) Explain how compaction control is achieved in the field using a Proctor needle. [4] CO-3