R20

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular Examinations March-2023
SOIL MECHANICS
(Agricultural Engineering)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Briefly explain different types of soil structures which can occur in nature.	CO1	L1	6M
	b	Explain consistency limits of soil with the help of a typical graph drawn between water content and volume of soil and show different states of soil.	CO1	L1	6M

OR

2	A test for the relative density of soil in place was performed by digging a small hole in the soil. The volume of the hole was 400 ml and the moist weight of the excavated soil was 9 N. After oven drying the weight was 7.8 N. Of the dried soil, 4 N was poured into a vessel in a very loose state, and its volume was found to be 270 ml. The same wight of soil when vibrated and tamped had a volume of 200 ml. Determine the relative density	CO1	L3	12M

UNIT-II

3	a	What is a flow net? Describe its properties and applications.	CO2	L2	6M
	b	The capillary rise in silt is 50 cm and that in fine sand is 30 cm. What is the difference in the pore size of the two soils?	CO2	L3	6M

OR

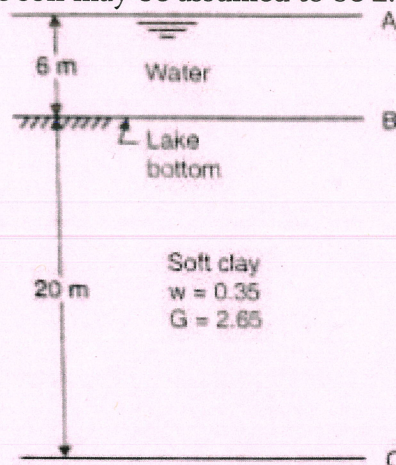|			
4	Compute the total, effective and pore pressure at a depth of 20 m below the bottom of a lake 6 m deep. The bottom of lake consists of soft clay with a thickness of more than 20 m. The average water content of the clay is 35% and the specific gravity of the soil may be assumed to be 2.65.	CO2	L3	12M

Figure   – Lake Profile

UNIT-III

5	Give a detailed account on effect of compaction on engineering properties of soils.	CO4	L1	12M

OR

6	Derive the equation for vertical stress under a strip load (i) at a point below the center of the strip (ii) point not below the center of the strip.	CO3	L2	12M

UNIT-IV

7	A homogeneous clay layer 12 m thick is expected to have an ultimate settlement of 332 mm. After a time span of 3 years, the average settlement was measured to be 152 mm. How much longer will it take for the average settlement to attain 237 mm?	CO5	L4	12M

OR

8	Define the following items: (i) Coefficient of compressibility (ii) Coefficient of volume change (iii)Compression index (iv)Expansion index (v) Recompression index	CO5	L1	12M

UNIT-V

9	With the help of sketch explain how Direct Shear Test is conducted. What are its merits and demerits?	CO6	L1	12M

OR

10	a	What is liquefaction of sands? How can it be prevented?	CO6	L1	6M
	b	Explain the effect of initial density on changes in void ratio with the help of Shearing strain Vs Void ratio graph. Define Critical Void Ratio locate it on the Shearing strain Vs Void ration graph.	CO6	L1	6M

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