9/12/24, AN

Roll No. | | | | | | | | | | |

ADDITIONAL CONTROLLER OF EXAMINATIONS AU CHENNAI 600 025

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E/B.Tech/B.Arch (F.T) END SEMESTER EXAMINATIONS – NOV / DEC 2024

AGRICULTURAL AND IRRIGATION ENGINEERING

3rd Semester

AI7301 & Soil Science and Engineering

(Regulation2015)

Time: 3 Hours | Answer ALL Questions | Max.Marks100

PART- A (10x2=20 Marks)

Q.No	Questions	Marks
1.	What is humification?	2
2.	What is desalinization?	2
3.	What is meant by reclamation of soil?	2
4.	List the majortypes of soils In Tamil Nadu.	2
5.	What is meant by density index and relative density?	2
6.	What is porosity?	2
7.	Define Darcy's law.	2
8.	Define permeability.	2
9.	What is infinite slope?	2
10.	Define the term slip angle?	2

PART- B (5x 13=65 Marks)

(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks
11.	a) What are the different steps involved in soil formation process?	13
	OR	
	b) Define soil profile. Describe the soil profile and its development with sketch.	13
12.	a)Name the 12 soil orders and very briefly describe (any 8) each other major distinguishing properties/diagnostic horizons according to the most general level of classification in the USDA system of soil taxonomy?	13
	OR	
	b) Explain the land use capability classification with a neat sketch.	13
13.	a) A soil sample has a porosity of 40%, the specific gravity of solids 2.70. Calculate (a) void ratio (b) dry density (c) unit weight if the soil is 50% saturated (d) unit weight if the soil is completely saturated	13
	OR	
	b) Explain the procedure of determining the shrinkage limit in the laboratory.	13
14.	a) A falling head permeability test is to be performed on a soil sample whose permeability estimated to be about 3 x 10^{-5} cm/s. What diameter of the stand pipe should be used if the head is to drop from 27.5 cm to 20.0 cm in 5 minutes and if the cross-sectional area and length of the sample are respectively 15 cm2 and 8.5 cm? Will it take the same time for the head to drop from 37.7 cm to 30.0 cm?	13
	OR	
	b) Explain the direct shear test to determine the shear strength of soil.	13
15.	a) Explain the procedure to calculate the factor of safety of a finite slope possessing both cohesion and friction (C-Ø) by method of slices.	13
	OR	

	b)Explain Terzaghi's analysis of bearing capacity of soil in general shear failure with assumptions.	13

PART- C(1x 15=15 Marks)

(Q.No 16 is Compulsory)

Q.No	Questions	Marks
16.	Describe the triaxial shear test. What are the advantages of triaxial shear test over the direct shear test?	15

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