RollNo.

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APR/MAY 2024

AGRICULTURAL AND IRRIGAITON ENGINEERING
3RD Semester
AI7301 &SOIL SCIENCE AND ENGINEERING

(Regulation2015/2019)

Time:3hrs

Max.Marks: 100

PART- A(10x2=20Marks)
(Answer all Questions)

Q.No	Questions	Marks
1	Define major component of soil	2
2	Write the soil forming minerals.	2
3	Write the characteristics of laterite soil.	2
4	List the majortypes of soils In Tamil Nadu.	2
5	Define Optimum moisture content.	2
6	Define liquid limit.	2
7	State Darcy's law of permeability?	2
8	What is the angle of internal friction?	2
9	Write the assumptions of Terzaghi are bearing capacity theory.	2
10	List the requirements of good foundation.	2

PART- B(5x 13=65Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks
11 (a) (i)	Discuss the different types of soil structures with a neat sketch	13
	(OR)	
11 (b) (i)	List the clay minerals and its uses. Brief the chemical composition of the clay minerals its arrangement and its effect on reaction with water.	13
12 (a) (i)	Briefly explain the eight major types of soils according to Indian council of Agricultural Research that is found in India.	13
	(OR)	
12 (b) (i)	Explain the land use capability classification with a neat sketch.	13
13 (a) (i)	In the natural state, a moist soil has a volume of 0.0093 m3 and weighs 177.6N. The oven dry weight of the soil is 153.6 N. If Gs=2.71. Calculate the moisture content, moist unit weight, dry unit weight, void ratio, porosity and degree of saturation.	7
(ii)	Describe briefly about the textural soil classification system.	6
	(OR)	
13 (b) (i)	Discuss the proctor compaction test in details	7
(ii)	Derive the relationship between porosity and void ratio.	6
14 (a) (i)	Describe the Vane Shear test in detail and classify the methods adopted in this test-Fully Submerged Vane and Partially Submerged Vane.	13
	(OR)	
14 (b) (i)	Describe the direct shear test with neat sketch Give the advantages and disadvantages of the shear test.	13
15 (a) (i)	A 5 m deep canal has side slopes of 1:1, The properties of soil are Cu=	8

	20KN/m^2, fu=10°, e=008 and G=2.8. If Taylor's stability number is 0.108, determine the factor of safety with respect to cohesion when the canal runs full. Also find the same in case of sudden drawdown, if Taylor's stability number for this condition is 0.137.	
(ii)	Explain the causes of slope failure.	5
	(OR)	
15 (b) (i)	Explain Terzaghi's analysis of bearing capacity of soil in general shear failure with assumptions.	13

PART- C(1x 15=15Marks)

(Q.No. 16 is Compulsory)

Q.No	Questions	Marks
16 (i)	Discuss about the plate load test for determining the Bearing capacity of foundation and How do you estimate the settlement of footing on sand using the results of a plate load test?	15