

Register No : _____

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/ B.TECH END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Third Semester

Agricultural Engineering

AI3301 - Principles of Soil Science and Engineering

Regulations - 2021

Duration : 3 Hrs

Maximum: 100 Marks

PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Differentiate igneous and metamorphic rocks.	RE	1	2
2.	What is soil consistency and what does it indicate?	UN	1	2
3.	What is soil taxonomy and how it is useful?	UN	2	2
4.	What are problem soils?	RE	2	2
5.	What are the three basic soil parameters can be determined from these grain-size distribution curve?	RE	3	2
6.	Write short notes on liquid limit.	UN	3	2
7.	State Darcy's law and explain its notations.	UN	4	2
8.	What is permeability and explain its importance?	UN	4	2
9.	What is Terzhaghi's formula?	RE	5	2
10.	What are the causes of slope failure?	UN	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Explain a soil profile with a neat sketch.	UN	1	7
	ii Discuss about the classification of soil water.	UN	1	6
	Or			
	b i Explain about the soil forming processes.	UN	1	7
	ii Explain the importance of soil temperature.	UN	1	6
12.	a i Explain the Indian standard soil classification system.	UN	2	7
	ii What are base maps and how is it used for soil survey and mapping.	RE	2	6
	Or			
	b i Explain in detail about the various land use classification classes.	UN	2	7
	ii Discuss in detail about soil suitability.	UN	2	6

13.	a i	What is compaction of soil and explain the factors affecting compaction.	UN	3	5
	ii	A soil sample has a porosity of 40 %. The specific gravity of solids is 2.7. Calculate (a) voids ratio (b) dry density (c) unit weight if the soil is 50 % saturated (d) unit weight if the soil is fully saturated	AP	3	8
		Or			
	b i	Explain in detail about the phase relation of soil.	UN	3	7
	ii	Discuss in detail about the standard proctor's compaction test.	UN	3	6
14.	a i	During a constant head permeameter test, a flow Q of 160 cm ³ is measured in 5 mins under a const. head of 15 cm. The specimen is 6 cm long and has a sectional area of 50 cm ² . The porosity of specimen is 42%. Determine the permeability, the flow velocity V and seepage velocity Vs.	AP	4	7
	ii	Explain in detail about the method of determination of co-efficient of permeability.	UN	4	6
		Or			
	b i	Explain Mohr-Coulomb failure theory.	UN	4	7
	ii	Discuss about the vane shear test.	UN	4	6
15.	a i	Explain the different types of slope failure.	UN	5	7
	ii	Discuss about the friction circle method.	UN	5	6
		Or			
	b i	Discuss about analysis of finite and infinite slopes in detail.	UN	5	8
	ii	Briefly discuss about shallow foundations.	UN	5	5

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>	<i>Questions</i>		<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a i	Discuss about the various soils physical properties.	AP	1	8
	ii	Explain the types and methods of soil survey.	AP	2	7
		Or			
	b i	Develop the bearing capacity and what are the factors which affect bearing capacity of soils.	AP	5	8
	ii	Discuss in detail about Atterberg limits and indices.	AP	3	7