QP Code: RM22BTECH179 | Reg. No | | | | | | | | | | | AY 22

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fourth Semester Regular) Examinations, May – 2024

22BCVPC24003 - Geotechnical Engineering-I

(Civil)

Time: 3 hrs | Maximum: 70 Marks

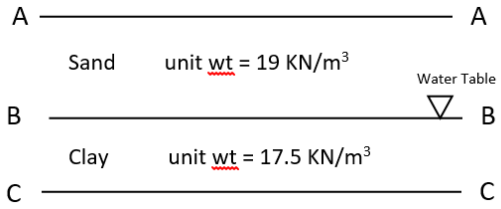
(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions		CO #	Blooms Level
a.	Differentiate the different types of soils on the basis of their particle size.	CO1	K4
b.	Differentiate between Standard Proctor Test and Modified Proctor Test.	CO2	K4
c.	What is Quick Sand Condition?	CO2	K2
d.	Write Any two differences between the Constant Permeability Test and Falling Head Permeability Test.	CO2	K1
e.	Enlist various possible tests conducted from Triaxial Test Apparatus.	CO4	K2

PART – B **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions		Marks	CO #	Blooms Level
2. a.	For a moist soil sample, the following are given. • Total volume: V = 1.2 m^3 • Total mass: M = 2350 kg • Moisture content: w = 8.6% • Specific gravity of soil solids: G_s = 2.71 Determine the following: (i) Moist density (ii) Dry density (iii) Void ratio (iv) Porosity (v) Degree of saturation	10	CO1	K4
b.	What are Void ratio, Specific gravity, and water content? What is the difference between Density and Unit Weight of soil?	5	CO1	K1
	(OR)			
c.	Define the various Consistency Limits?	5	CO1	K1
d.	For a falling-head permeability test, the following values are given: • Length of specimen = 200 mm • Area of soil specimen = 1000 mm^2 • Area of standpipe = 40 mm^2 • At time t = 0, the head difference is 500 mm • At time t = 180 sec, the head difference is 300 mm Determine the hydraulic conductivity of the soil in cm/sec. Determine the Coefficient of Permeability (k).	10	CO2	K4
3.a.	Enlist various methods of compaction used in the field. Discuss Vibro-Compaction and Dynamic compaction in details.	10	CO3	K2
b.	Explain the Darcy's law of Permeability with assumptions.	5	CO2	K2
	(OR)			

c.	Write the advantages and disadvantages of Direct Shear Tests and Triaxial Tests	5	CO4	K1
d.	Write notes on Field Compaction Methods.	10	CO3	K2
4.a.	A sample of dry cohesion-less soil was tested in a triaxial machine. If the angle of shearing resistance was 36^o and confining pressure was 120 kN/m^2. Determine the deviator stress at which the sample failed.	5	CO4	K4
b.	(i) For a soil, suppose that D_{10} = 0.08 mm, D_{30} = 0.22 mm, and D_{60} = 0.41 mm. Calculate the Coefficient of Uniformity and the Coefficient of Curvature. (ii) Define the followings: (a) Compaction parameters (b) Shear strength parameters	10	CO1	K4
	(OR)			
c.	Explain the factors affecting permeability in details.	6	CO2	K2
d.	Define: (i) Co-efficient of Compressibility (ii) Co-efficient of Volume Change (iii) Compression Index	9	CO3	K1
5.a.	Explain concept of consolidation using Spring Analogy	8	CO3	K2
b.	Explain the initial, primary and secondary consolidation in details.	7	CO3	K2
	(OR)			
c.	Determine the effective stress, total stress and pore pressure at section A, B, and C in the fig below, Water table is at Section B. The thickness of sand layer is 6 m from ground surface and thickness of clay layer is 4 m. 	10	CO1	K3
d.	Draw a representative plot for the results obtained from Direct Shear Test experiments with the necessary details.	5	CO	K3

--- End of Paper ---