Total No. of printed pages = 4

RETEST EXAMINATION–2022

Semester : 5th

Subject Code : CT-503

GEOTECHNICAL ENGINEERING

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instruction :

- *All* questions of PART–A and PART–B are compulsory.

PART–A

Marks–25

1. Fill in the blanks : 1×10=10

   (a) In nature, soil exist as a —— phase system.

   (b) The ratio between volumes of voids to the —— in a soil mass is called void ratio.

   (c) Liquid limit-plastic limit = ——.

   (d) In compaction expulsion of —— occur.

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(e) The volume of the cylinder used in proctor test is —— cm^3.

(f) The water content corresponding to maximum dry density is called ____.

(g) For Darcy's law to be validating the flow in soil should be ____.

(h) In consolidation the load applied is ____.

(i) The shearing resistance of a soil is constituted by ____ and _____.

(j) The unit of coefficient of permeability is ____.

2. Classify the soil : 1×5=5

(a) CL (b) ML

(c) OH (d) GW

(e) SP.

3. Answer the following questions : 2×5=10

(a) Deduce the relation between void ratio (e) and porosity (n) by phase diagram.

(b) Define well grade and poorly graded soil.

(c) Define seepage velocity and discharge velocity.

(d) What are the laboratory tests to determine shear strength of soil ?

(e) Write the differences between pre-consolidated, over-consolidated and under-consolidated soil.

PART – B

Marks – 45

4. (a) A sample of saturated soil has a water content of 35%. The specific gravity of solid is 2.65. Determine the void ratio, porosity, saturated unit weight and dry unit weight. 10

(b) Explain the falling head permeability test. 5

5. (a) An earth embankment is compacted at a water content of 18% to a bulk density of 19.2 kN/m^3. If the specific gravity of the sand is 2.7, find the void ratio and the degree of saturation of the compacted embankment. 5

(b) Explain the consolidation process by Terzaghi's spring piston analogy model. 10

6. (a) Write the differences between consolidation and compaction. 5

(b) In a falling head permeability test on a specimen 6 cm high and 50 cm^2 in cross-sectional area, the water level in the standpipe of 0.8 cm^2 in cross-sectional area dropped from a height of 60 cm to 20 cm in 3 min 20 sec. Find the permeability. 5

(c) Write down the factors affecting compaction. 5