Total No. of printed pages = 4

END SEMESTER EXAMINATION – 2021

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) Unsaturated soil exists as a _____ phase system.

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

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(c) Specific gravity = _____ divided by _____.

(d) In compaction expulsion of _____ occurs.

(e) Plastic limit of soil is determined by _____ apparatus.

(f) Water content is the ratio between _____ and _____.

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

(h) The coefficient of permeability is determined in laboratory by _____ methods.

(i) Alluvium soil are transported by _____.

(j) Due to increase in compaction, permeability _____.

2. Classify the soil : 1×5=5

(a) ML

(b) SM

(c) CI

(d) SC

(e) OH

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

(a) Draw phase diagram for usaturated soil and completely dry soil.

(b) Define Consolidation.

(c) Define relative density or density index.

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

(e) Define Dercy's law.

PART – B

Marks – 45

4. (a) A soil has a void ratio of 0.85, S = 40% and G = 2.7. Find the water content, porosity, bulk density and dry density. 10

(b) What are the factors affecting compaction ? 5

5. (a) A constant head permeability test was run on a sand sample of 40 cm long and 25 cm^2 in area. When the loss of head was 62 cm, the quantity of water collected in 2 min was 300 ml. Determine the co-efficient of permeability of the sample. 5

(b) Explain the constant head permeability test. 10

6. (a) A moist soil sample compacted into a mould of 1000 cm^3 capacity and weight 35 N. A representative sample of soil taken from it has an initial weight of 0.187 N and oven dry weight of 0.1691N. Determine : 10

(i) Water content

(ii) Wet density

(iii) Dry density

(iv) Void ratio

(v) Degree of saturation.

(b) Write down the differences between consolidation and compaction. 5