END SEMESTER/ RE-TEST EXAMINATION, 2020

5th SEMESTER
CT-503
GEOTECHNICAL ENGINEERING
FULL MARK 70
TIME 3 HRS.

PART A (25 marks)

1) Fill in the blanks **1x10=10**

a) Saturated soil exist as a------ phase system.
b) The ratio between volumes of voids to the ------ in a soil mass is called porosity.
c) Plasticity index = ------ minus --------
d) In consolidation expulsion of ----- occur.
e) Liquid limit of soil is determined by ------- apparatus
f) Water content of soil can be determined by ----- method
g) For Darcy's law to be validating the flow in soil should be----------.
h) The unit of coefficient of permeability is -----
i) The shearing resistance of a soil is constituted by -------- and -------.
j) Shear strength can be determined by ------ methods

2) Classify the soil **1x5=5**

a) MI.
b) CL.
c) CH.
d) GP.
e) SW.

3) Answer the following questions **2x5= 10**

a) Draw phase diagram for saturated soil and completely dry soil.

b) Define the Atterberg's limits.

c) Define seepage velocity and discharge velocity.

d) What are the laboratory tests to determine coefficient of permeability?

e) Define Dercy's law.

PART - B

(4)

(a) A sample of soil has porosity of 42%. The specific gravity of solid is 2.65. Determine the (i) void ratio (ii)dry density (iii) unit weight, if the soil is 50% saturated and (iv) unit weight of the soil when it is fully saturated. **10**

(b) What are the factors affecting coefficient of permeability **5**

(5)

(a) During a constant head permeability test a flow 'Q' of 160 cm^3 is measured in 5 min under a constant head of 15 cm. The specimen is 6 cm long and has a cross sectional area of 50 cm^2. The porosity of the specimen is 42%. Determine the permeability, the flow velocity and seepage velocity. **5**

(b) Explain the standard proctor test and draw the compaction curve. **10**

(6)

(a) A moist soil sample compacted into a mould of 1000 cm3 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 0.1691 N. Determine (i) Water content (ii) Wet density (iii) dry density (iv) void ratio (v) Degree of saturation **10**

(b) Write down the factors affecting consolidation. **5**

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