KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agri. Engg.) 2019 Admission
IV Semester Final Examination- November 2021

Lwre 2205 **Soil Mechanics (2+1)**

Marks: 50
Time: 2 hours

I **Fill in the blanks** **(10x1=10)**

1. Direction of seepage is always perpendicular to_____lines.
2. Soil with consistency index equal to zero is the soil at its _____limit.
3. The sieve used to separate the coarse analysis from fine analysis is of size _____
4. The sedimentation analysis is based on _____ law.
5. Coefficient of earth pressure at rest is _____ than active earth pressure but _____than passive earth pressure.

Define

6. Air Content
7. Backfill
8. Liquidity index
9. Degree of saturation
10. Density index

II **Write short notes on ANY FIVE of the following** **(5x2=10)**

1. Derive relationship between γ_d, G, w and S_r
2. Write short note on Capillary pressure.
3. What is meant by compaction? Enlist different compaction tests used to determine water-density relationship of soil.
4. Enlist the factors affecting permeability.
5. Write short note on particle size distribution curve.
6. Enlist different method of determination of water content and specific gravity of soil.
7. Briefly explain the assumptions of Terzaghi's theory of one dimensional consolidation.

III **Answer ANY FIVE of the following.** **(5x4=20)**

1. What is soil, soil mechanics and soil engineering? Explain the field of application of soil mechanics.
2. Derive the relationship between e, G, w and Sr.
3. State the procedure for determination of water content of soil using pycnometer method.
4. Considering the approximate version of Stoke's law $V=1.077xD^2$, with usual notations and units, find the time required for settlement of soil particles through a height of 10 cm for the particle of diameter 0.06 mm.
5. An undisturbed saturated specimen of clay has a volume of 18.9 cm^3 and a mass of 30.2 g. on oven drying the mass reduces to 18.0 g. the volume of dry specimen as determined by displacement of mercury is 9.9 cm^3. Determine shrinkage limit and specific gravity.
6. What are the different methods of field compaction? What is the difference between consolidation and compaction?
7. Write a descriptive note, with sketches, on Proctor needle method.

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1. A soil sample has a porosity of 40 per cent. The specific gravity is 2.70. Calculate a) voids ratio, b) dry density c) unit weight if soil is 50 % saturated and d) unit weight if the soil is completely saturated.
2. Write the procedure for Rebhann's graphical method for active pressure with figure.

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