REGISTRATION NUMBER | | | | | | | | | | |

SRINIX COLLEGE OF ENGINEERING

1st INTERNAL EXAMINATION-2018-19

Subject-**GTE** Semester-**3RD** Branch-**CIVIL**

Full Marks-**50** Time-**2.00 Hrs**

ANSWER ALL QUESTIONS (PART-A) **[2×5=10]**

1. The soil that will have maximum void ratio is

   (a) Gravel (b) sand (c) silt (d) clay

2. Humus is

   (a) A half decomposed soil (b) A fully decomposed soil (c) inorganic soil (d) a type of rock

3. When porosity is 50%, the void ratio is

   (a) 0 (b) 0.50 (c) 1 (d) 1.5

4. In hydrometer analysis the principle used is

   (a) Newton's law (b) Darcy's law (c) Stoke's law (d) Rehabann's law

5. At shrinkage limit the degree of saturation is

   (a) 0% (b) 50% (c) 75% (d) 100%

ANSWER ALL QUESTIONS (PART-B) **[2X10=20]**

1. What is the approximate depth at which effective vertical pressure is equal to 100KN/m^2 in a typicaldeposit of submerged soil?
2. If z1, z2 and z3 are the thickness of three soil layers and k1,k2 and k3 are the permeability of the respective layers then average permeability for perpendicular flow will be?
3. What is thixotropy and give a name of soil that shows thixotropy?
4. Explain 3 phase system for soil?
5. Define flow line and equipotential line?
6. Explain seepage quantity?

7. What are the properties of flow net?
8. Differentiate between compaction and consolidation?
9. What is zero air void line and write the equation of zero air void line?
10. What are the effects of compaction on soil properties?

ANSWER ANY TWO QUESTIONS (PART-C) **[10X2=20]**

1. (a) Classify the soil according to USCS classification system? **[5]**
   (b) The mass specific gravity of fully saturated clay having a water content of 40% is 1.88. On oven drying the mass specific gravity drops to 1.74. Find out the specific gravity, shrinkage limit and shrinkage ratio of the soil? **[5]**
2. Laboratory sieve analysis was carried out on a soil sample using a complete set of standard IS sieves. Out of 600gm of soil used in the test, 240gm was retained on IS 600µ sieve, 300gm was retained on IS 500µ sieve and the remaining was retained on 425µ sieve. Find out the coefficient of uniformity of the soil and find out theclassification of soil? **[10]**

3. (a) A layer of saturated clay 5m thick is over lain by a sand 4m deep. The water table is 3m below the top surface. The saturated unit weight of clay and sand are 18KN/$m^3$and 20KN/m^3 respectively. Above water table, the unit weight of sand is 17KN/m^3. Find out the effective pressure on a horizontal plane at a depth of 9m below the ground surface and what will be the increase in the effective pressure at 9m if the soil gets saturated by capillary, up to a height of 1m above the water table? **[10]**
4. (a) Describe the factors those are affecting compaction **[5]**
   (b) Derive the Laplace equation of two dimensional flows under seepage pressure condition. **[5]**