

REGISTRATION NUMBER

## SRINIX COLLEGE OF ENGINEERING

1<sup>ST</sup> INTERNAL EXAMINATION-2020-21

Subject-FE

Semester-6<sup>TH</sup>

Branch-CE

Full Mark-30

Time-1.30Hrs

ANSWER ALL QUESTIONS (PART-A)

[2X5=10]

- 1. Differentiate between Rankine and Coulomb's theories of Earth pressure.
- 2. Distinguish between local and punching shear failure.
- 3. A standard penetration test was conducted on saturated fine sand below the ground water table. The SPT value was found to be 32. Does the value represent true SPT Value? Explain.
- 4. List the factor affecting bearing capacity of soil.
- 5. Define safe bearing capacity.

## ANSWER ANY TWO QUESTIONS (PART-B) [5X2=10]

- 1. A group of 9 piles arranged in a square pattern diameter and length of each pile as 25 cm and 10m respectively, each used as a foundation in soft clay deposit. Taking the unconfined compressing strength of clay as 120 KN/m<sup>2</sup> and the pile spacing as 100cm centre to centre, find the load capacity of the group. Assume the bearing capacity factor N<sub>c</sub>=9 and Adhesion factor=0.75. A factor of safety of 2.5 may be taken.
- 2. A retaining wall 6m high retains sand with  $Ø=30^{\circ}$  and unit weight 24 KN/m<sup>3</sup> upto a depth of 3m from top. From 3m to 6m the material is a cohesive soil with c=20KN/m<sup>2</sup> and  $Ø=20^{\circ}$ . Unit weight of cohesive soil is 18 KN/m<sup>3</sup>. A uniform surcharge of 100KN/m<sup>2</sup>

acts on the top of soil. Determine the total lateral pressure acting on the wall and its point of application.

3. Explain the difference between Terzaghi's method and Meyer Hoff's method for finding bearing capacity of soil.

## ANSWER ANY ONE QUESTION (PART-C) [10X1=10]

- 1. A strip footing 2m wide carries a load intensity of 400 KN/m<sup>2</sup> at a depth of 1.2m in sand. The saturated unit weight of sand is 19.5 KN/m<sup>3</sup> and unit weight above water table is 16.8 KN/m<sup>3</sup>. The shear strength parameters are c=0 and  $Ø=35^{\circ}$ . Determine the factor of safety with respect to shear failure for the following cases of location of water table. Use Terzaghi's equations. N<sub>q</sub>=41.4 and N<sub>Y</sub>=42.4.
  - a. Water table is 4m below G.L
  - b. Water table is 1.2m below G.L
  - c. Water table is 2.5m below G.L
  - d. Water table is 0.5m below G.L
  - e. Water table is at G.L itself
- 2. (a) Discuss Culmann's graphical solution for active Earth pressure.
  - (b) Discuss the Brinch Hansen analysis for bearing capacity of foundation.