

### ASSIGNMENT:3 PILE FOUNDATION

1. Elaborate the conditions where a pile foundation is more suitable than a shallow foundation.
2. Discuss various dynamic formulae. What are their limitations?
3. How would you estimate the load carrying capacity of a pile in (a) cohesionless soils (b) Cohesive soils?
4. Explain different field conditions in which negative skin friction can develop. Derive an equation to Compute the negative skin friction for cohesive fill overlying non-cohesive soil.
5. Write short note on group action and efficiency of pile group.
6. Explain 'Pile load test' to determine the bearing resistance of pile.
7. Write about piles according to method of installation and their load carrying characteristics.
8. A group of 9 piles , 9m long is used as the foundation of column. The piles are 30 cm in diameter with centre to centre spacing 90 cm. The subsoil consists of clay with unconfined compressive Strength  $170 \text{ kN/m}^2$  . Estimate safe load. Take FOS = 3.
9. In a 16 pile group, the pile diameter is 0.4 m and c.c spacing of piles in the square group is 1.5 m. If  $C_u = 50 \text{ kN/m}^2$  , determine whether the failure would occur as block failure or when the piles act individually. Neglect bearing at the tip of the piles are 12 m long. Take  $m = 0.7$  for shear mobilization around each pile. Also determine the safe load on this group.
10. Compute number of piles required to transfer the load of 2800 kN of a structure. The length of pile is 10 m , and 400 mm diameter. The piles are bored in deep deposit of clay having undrained shear strength  $90 \text{ kN/m}^2$  . Take FOS 2.5. Also suggest the arrangement of piles.