



12. (a) Explain Terzaghi's analysis of bearing capacity of soil in general shear failure with assumptions. (16)

Or

- (b) Explain different types of shear failures of soil with neat sketch. (16)

13. (a) A trapezoidal footing is to be produced to support two square columns of 30 cm and 50 cm sides respectively. Columns are 6 meters apart and the safe bearing capacity of the soil is  $400 \text{ kN/m}^2$ . The bigger column carries a load of 5000 kN and the smaller carries a load of 3000 kN. Design a suitable size of the footing so that it does not extend beyond the face of the columns. (16)

Or

- (b) Write the IS codal provisions for design of raft foundation. (16)

14. (a) A group of 16 piles of 50 cm diameter is arranged with a center to center spacing of 1.0 m. The piles are 9 m long and are embedded in soft clay with cohesion  $30 \text{ kN/m}$ . Bearing resistance may be neglected for the piles. Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group. (16)

Or

- (b) Explain the method of determining the load carrying capacity of a pile. (16)

15. (a) Explain the Rebhann's graphical method for active earth pressure calculation. (16)

Or

- (b) Explain the Rankine's theory for various backfill condition to calculate active state earth pressure. (16)