



11. (a) Explain the factors governing the compaction of soil.

Or

- (b) Explain the textural classification system with a neat sketch.

12. (a) Explain the procedure involved in constant head permeability test with neat sketch.

Or

- (b) A sample in a variable head permeameter is 8 cm in diameter and 12 cm high. The permeability of the sample is estimated to be  $10 \times 10^{-4}$  cm/sec. If it is desired that the head in the stand pipe should fall from 25 cm to 13 cm in 5 minutes, determine the size of the stand pipe which should be used.

13. (a) Discuss the factors influencing settlement characteristics of soils.

Or

- (b) A line load of 120 kN/metre run extends to a long distance. Determine the intensity of vertical stress at a point, 2 metre below the surface and (i) directly under the line load, and (ii) at a distance 2 metre perpendicular to the line. Use Boussinesq's theory.

14. (a) A particular soil failed under a major principal stress of 300 kN/m<sup>2</sup> with a corresponding minor principal stress of 100 kN/m<sup>2</sup>. If, for the same soil, the minor principal stress had been 200 kN/m<sup>2</sup>, determine what the major principal stress would have been if (i)  $\phi = 30$  degrees (ii)  $\phi = \text{Zero}$  degrees.

Or

- (b) Explain un-confined compression test with neat sketch.

15. (a) Calculate the factor of safety with respect to cohesion, of a clay slope laid at 1 in 2 to a height of 10 m, if the angle of internal friction  $\phi = 10^\circ$ ,  $C = 25$  kN/m<sup>2</sup> and  $\gamma = 19$  kN/m<sup>3</sup>. What will be the critical height of the slope in this soil?

Or

- (b) Explain the following with sketch :

(i) Total stress analysis

(8)

(ii) Effective stress analysis.

(8)