

Reg. No.

A U H I P P O . C O M *

Question Paper Code : 71248

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Fourth Semester

Civil Engineering

CE 2251/CE 42/CE 1251/080100018/10111 CE 402 — SOIL MECHANICS

(Regulation 2008/2010)

(Common to PTCE 2251/10111 CE 402 — Soil Mechanics for B.E. (Part-Time)
Third Semester – Civil Engineering – Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is compaction curve?
2. Mention the classification systems of soil.
3. State Darcy's law.
4. Define capillary water.
5. What is consolidation?
6. Give the applications of pressure bulb.
7. What is meant by deviator stress?
8. What are shear strength parameters?
9. Mention the methods of protecting slopes of soils.
10. Write the expression for stability number.

PART B — (5 × 16 = 80 marks)

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 10×10^{-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/m² with a corresponding minor principal stress of 100 kN/m². If, for the same soil, the minor principal stress had been 200 kN/m², determine what the major principal stress would have been if (i) $\phi = 30$ degrees (ii) $\phi =$ 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/m² and $y = 19$ kN/m³. 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)