

Hall Ticket Number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Code No. : 31025

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (Civil Engg.) III Year I-Semester Main & Backlog Examinations, December-2017

Soil Mechanics

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Write the representative heights of capillary rise (m) in different types of soils.
2. Differentiate between Specific Gravity of solids and mass Specific Gravity.
3. What is quick sand condition?
4. How would you determine average permeability of soil deposit consisting of number of layers?
5. Define Coefficient of volume change and Compression Index
6. The primary consolidation settlement of a 6m thick clay layer with single drainage is estimated as 90cm. Later it was found that, the medium has double drainage. Then, all other parameters remaining same, what will be the primary consolidation settlement?
7. Explain Mohr-Coulomb failure criterion.
8. The unconfined compressive strength of a soil is 100kPa. Determine its shear strength.
9. Write the variation of coefficient of earth pressure with the movement of the wall.
10. Explain the term 'Depth of tension crack' in cohesive backfills.

Part-B (5 × 10 = 50 Marks)

(All bits carry equal marks)

11. a) Differentiate between a residual soils and transported soils. Briefly define the characteristics of various common soils found in general use.
b) In a field exploration, a sample was collected in a sampling tube of internal diameter 5cm below ground water table. The length of the extracted sample was 10.2cm and its weight was 387gm. If $G = 2.7$, and the weight of the dried sample is 313gm, find the porosity, void ratio, degree of saturation and the dry density of the sample.
12. a) Explain the procedure to draw the phreatic line for a homogeneous earth dam with a horizontal filter using Kozeny's parabola.
b) An earth dam is built on an impervious foundation with a horizontal filter near the toe. The permeability of the soil in horizontal and vertical directions is 3×10^{-2} mm/s and 1×10^{-2} mm/s respectively. The full reservoir level is 30 metres above the base. A flownet constructed for the section of the dam consists of 4 flow channels and 16 head drops. Estimate the seepage loss per metre length of the dam.
13. a) What is Terzaghi's one dimensional consolidation theory? Derive it from fundamentals.
b) A 6m thick fully saturated compressible clay medium with an average initial effective overburden pressure of 90 kpa is undergoing consolidation process due to an increment of 60Kps. Determine the total primary consolidation settlement if $e_0 = 1.10$, $PL = 36\%$, $PI = 44$.