

QUESTION BANK ON GEOTECHNICAL ENGINEERING

1. Describe the 3-phase soil system with neat sketch.
2. Briefly explain the inter relationships between void ratio (e) degree of saturation (S_r), water content (w) & specific gravity (G).
3. For a soil sample the specific gravity of soil mass is 1.7 & specific gravity of soil particle is 2.7; determine the void ration (i) Assuming the soil sample is dry & (ii) The sample has a water content of 12%.
4. Describe the procedure of determining specific gravity of soil by pycnometer method.
5. Describe the method of oven drying method for determining water content of soil.
6. Describe the procedure of sieve analysis.
7. Describe particle size distribution curve with neat sketch; write the uses of particle size distribution curve.
8. Describe the various stages of consistency suggested by Atterberg.
9. Describe the method of determining liquid limit of soil in the laboratory.
10. What is an Atterberg indices.
11. Describe the Indian standard soil classification system.
12. Explain different type of soil structures with neat sketch.
13. Explain Darcy's law & co-efficient of permeability.
14. What are the different laboratory methods for determining co-efficient of permeability. Explain each test with neat sketch.
15. Explain the phenomena of quick sand with sketch.
16. Explain the laboratory method of light compaction test.
17. What are the factors affecting compaction.
18. Describe Terzaghi's mechanics of consolidation by piston & spring analogy.
19. Explain the Mohr-coulomb failure theory.
20. Explain Triaxial compression test for determining shear strength parameter of soil.
21. Explain Direct shear test procedure for determining the shear strength parameters of soil.
22. What are the different states of earth pressure; explain with neat sketch.
23. Derive Rankine's formula for earth pressure for the following cases (i) Backfill with no surcharge (ii) Backfill with uniform surcharge (Cohesionless soil only).
24. Describe about different types of shallows & deep foundation with neat sketches.
25. Explain about different types of bearing capacity failures.
26. Explain about plate load test & standard penetration test.
27. What is the effect of water table on bearing capacity of soil.

28. Derive Terzaghi's bearing capacity equation.