

## GEOTECHNICAL ENGINEERING

### Question Bank

#### Types of Soils, Index Properties, Inter-relationships and Soil Characterization

1. Describe in detail: Soil Formation in Geological cycle.
2. Explain: Chemical weathering.
3. Explain: Physical weathering.
4. Write Assumptions for drawing phase diagram.
5. Explain in detail with neat sketches: Three phase diagram of soil.
6. Define following terms: 1. Water content of soil, 2. Bulk unit weight, 3. Specific Gravity, 4. Void ratio, 5. Density Index.
7. Derive an Expression:  $e = \frac{wG}{S_r}$
8. What is Particle size Distribution of soil?
9. What do you mean by Consistency limits?
10. What are the basic requirements of Soil Classification?

#### Permeability and Seepage

1. What do you mean by Permeability?
2. Explain with neat sketches: 1. Total head, 2. Hydraulic head, 3. Hydraulic Gradient,  
4. Seepage, 5. Seepage Velocity.
3. Explain in detail: Piping
4. What do you mean by Quick sand condition?
5. Derive:  $i_c = \frac{G-1}{1+e}$
6. Explain In detail: Darcy's Law.

7. Describe in detail: Factors affecting permeability of Soil.
8. Derive an equation of Average permeability parallel to the bedding plane.  
What is Flow net? Explain in detail with neat sketches.

### **Compaction and Consolidation of Soil**

1. What do you mean by Compaction? Explain theory of Compaction.
2. List out all factors affecting Compaction. Explain each in detail.
3. Explain in detail: Standard Proctor Test with neat sketches.
4. Differentiate between Standard Proctor and Modified Proctor.
5. Explain: Effects of Compaction on Properties of Soil.
6. What do you mean by Placement water Content? Describe in detail.
7. What is Proctor Needle? Explain with neat Sketches.
8. What do you mean by Relative Compaction?
9. What are the different methods of Compaction used in field? Explain each in detail.

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