

**Bhagwan Mahavir College of Engineering and Technology,
Surat**

Assignment-1
Introduction

Date:-

- 1) What is foundation? Explain types of foundation.
- 2) What are the factors affecting the selection of types of foundation.
- 3) What are the steps while choosing the types of foundation based on soil condition?
- 4) Short note-
 - (1) Site Exploration
 - (2) Site investigation
- 5) Enlist the methods of obtaining soil samples. Explain wash boring & Rotary Drilling.
- 6) Explain the standard penetration test.
- 7) Difference between (i) SPT & DCPT (ii) SCT & DCPT

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Assignment-2
Shallow Foundation

Date:-

- 1) What is bearing capacity? Enlist the method of determining bearing capacity & Explain Plate load test.
- 2) What are the factors affecting bearing capacity?
- 3) Enlist the modes of shear failure & compare Local shear failure and punching shear failure.
- 4) Write an assumptions made in the terzaghi's Bearing capacity. Also draw different failure zones.
- 5) Write short note on
 - (i) Effect of water table on bearing capacity
 - (ii) Effect of the size of the plate on bearing capacity
 - (iii) Pressure bulb
- 6) What are the basic assumptions in boussinesq's theory of stress distribution in soil?

- 7) Determine net allowable load and gross allowable load for a square footing of 2 m × 2 m size with a depth of foundation of 1.0 m. Assume local shear failure. Use Terzaghi's theory. Soil properties are : $\gamma = 18 \text{ kN/m}^3$, $c = 15 \text{ kN/m}^3$, For $\phi = 25^\circ$. $N_c = 14.8$, $N_q = 5.6$, $N_\gamma = 3.2$, F.S. = 3.0.. **GTU - W-13, 7 Marks**

- 8) A square footing 2.5 m × 2.5 m is built on of homogeneous bed of sand of density 19 kN/m³ having an angle of shearing resistance of 36°. The depth of foundation is 1.5 m below the ground surface. Calculate safe load that can be applied on the footing with a factor of safety of 3. Takes bearing capacity factor as $N_c = 27$, $N_q = 30$, $N_\gamma = 35$. **GTU - S-12, 7 Marks**

- 9) A strip footing of 2 m width is placed at a depth of 4 m below ground surface. Determine the net ultimate bearing capacity using,
 - (1) Terzaghi's equation
 - (2) Skempton's equation
 - (3) IS codeThe unit weight of soil 20 kN/m³ and cohesion $c = 10 \text{ kN/m}^2$. **GTU - S-11, S-13, 7 Marks**

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Assignment-3
(Shallow Foundation)

Date:-

- 1) Classify the pile according to their functions
- 2) Explain in detail under-remed pile foun.
- 3) Discuss various dynamic formula for load carrying capacity of pile with their limitations.
- 4) What do you mean by pile group efficiency? Explain any one method to find it.
- 5) Explain negative skin friction.

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Assignment-4
(introduction to geosynthetics)

Date:-

- 1) What are the characteristics of black cotton soil?
- 2) Write down preventive measure of expansive soil. Explain each point in short.
- 3) What are the factors affecting swelling of soil
- 4) What are the methods of determination of swelling? Write down each method in short.
- 5) What is geo-synthetic? What are the function of geo-synthetic? Write down disadvantages of geo-synthetic.

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Assignment-5
(Retaining wall)

Date:-

- 1) What are the types of retaining walls?
- 2) Write down difference between sheet pile wall & retaining wall.
Explain application of sheet pile.