

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**M.Tech Summer 2017 - 18 Examination**

**Semester: 2**  
**Subject Code: 03215154**  
**Subject Name: Soil Foundation and Structure Interaction**

**Date: 25/5/2018**  
**Time: 2.00 pm to 4.30 pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q:1(a)** State different types of sheet pile walls. Draw the sketches showing the pressure distribution. **(05)**
- Q:1(b)** Define modulus of subgrade reaction. Explain various factors affecting it. **(05)**
- Q:1(c)** Give the basic concept of soil-structure interaction and state how it differs from the conventional subject of soil mechanics and foundation engineering. **(05)**
- Q:2** Answer the following questions. (Attempt any three) (Each five marks) **(15)**
- (a) Elaborate any ONE field test for finding the dynamic soil properties.
- (b) Give with suitable sketches the various functions and applications of geosynthetics in Civil Engineering.
- (c) Draw settlement and contact pressure distribution diagram for Rigid footing.
- (d) Explain different mitigation techniques for Liquefaction.
- Q:3(a)** Explain finite difference method for the design of combined footing. **(07)**
- Q:3(b)** Explain design procedure of reinforced earth retaining wall. **(08)**
- OR**
- Q:3(b)** Draw actual pressure distribution diagram and simplified pressure distribution diagram of cantilever sheet pile in cohesion less soil. **(08)**
- Q:4(a)** Explain soil line method to determine contact pressure and bending moments. **(07)**
- OR**
- Q:4(a)** Find the depth of embedment for a cantilever sheet pile of height 6m having non-cohesive backfill throughout. soil properties are  $\gamma = 18 \text{ kN/m}^3$  and  $\phi = 30^\circ$  **(07)**
- Q:4(b)** Explain Hetenyi's method for analysis of combined footing. **(08)**