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

Semester: 2   Date: 28/05/2018
Subject Code: 03209180   Time: 02:00 pm to 04:30 pm
Subject Name: Soil Structure Interaction   Total Marks: 60

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)** Compare the properties of woven & non woven geotextile. **(05)**

B) Define Liquefaction & Explain types of Liquefaction **(05)**

C) Compare the conventional i.e. rigid methods of analysis of foundations with the flexible methods involved in the soil structure interaction **(05)**

Q.2 **Answer the following questions**. **(Attempt any three) (Each five mark)** **(15)**

A) Explain the method of determination of 'modulus of subgrade reaction' and the factors affecting the same.

B) Explain soil line method to determine contact pressure and bending moments.

C) Explain factors affecting Liquefaction & Also explain different mitigation techniques

D) Draw and explain the settlement profiles for perfectly flexible footings resting on clayey strata and sandy strata.

Q.3 **A)** Elaborate any two field tests for finding the dynamic soil properties **(07)**

B) A rectangular combined footing has L = 8.0 m, B = 2.0 m and EI = 1800 MNm^2. A 1.0 MN point load is acting at 2.0 m distance from the left edge and 2.0 MN point load is acting at 2.0 m from the right edge. Modulus of the sub grade for plate is determined to be 70 MN/m^3 after all correction within the clayey foundation soil. Divide the foundation in two elements only and by finite difference method determine settlement, Contact pressure, SF and BM values at the nodal points **(08)**

OR

B) With suitable sketches explain various functions and applications of geosynthetics in civil engineering. **(08)**

Q.4 **A)** Calculate the cyclic stress ratio developed at the site for the given data **(07)**

Depth(m)	1	2	3	6	8	10	12
N	8	10	12	10	17	22	24
r_d	0.99	0.98	0.96	0.93	0.90	0.88	0.85

Take $a_{max} = 0.3g$, $r_{sat} = 18$ kN/m^3. GWT is touching the GL. Also check the liquefaction potential at 2.0 m depth if CRR is 0.18.

OR

A) Briefly describe the process of designing a reinforced wall for internal & external stability using Geotextile as a reinforcement. **(07)**

B) Find the depth of embedment for a cantilever sheet pile as shown in Fig. below:- **(08)**