Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Winter 2019 - 20 Examination

Semester: 1 **Date: 16/12/2019**
Subject Code: 203215101 **Time: 10:30 am to 1:00 pm**
Subject Name: Advanced Foundation Engineering **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) Explain extent and depth of soil exploration. **(05)**

B) Define – i) Gross bearing capacity ii) sampler iii) Safe bearing capacity iv) negative skin friction v) collapsible soil. **(05)**

C) A drop hammer weighing 50 kN and having an effective fall of 0.75 m drives an RCC pile weighing 35kN. The average settlement per blow is 1.4 cm. The total temporary elastic compression is 1.8 cm. assuming coefficient of restitution as 0.25 and factor of safety 2.5, determine ultimate bearing capacity and allowable load on pile. **(05)**

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

A) Enlist all the forces acting on a caisson?

B) What do u mean by cofferdam? Explain use of each shape of cofferdam in detail.

C) Differentiate between SPT test and DCPT test.

D) In a 16 pile group, the pile diameter is 0.4 m , 12 m long and centre to center spacing of the square group is 1.5 m. If $c=50kN/m^2$, determine whether the failure would occur with the pile acting individually or as a group? Neglect bearing at the tip of the pile. Take $\alpha = 0.7$

Q.3 A) What is expansive soil? Provide remedial measures for construction on such soils? **(07)**

B) Compute the safe bearing capacity of a square footing of size 1.5 m located at a depth of 1 m below ground level in a soil of desnsity $18kN/m^3$, $\phi=30^o$ (Nc= 30.14, Nq=18.4, $N\gamma = 22.4$). If the water table rises to the ground level, what is reduction in SBC. Take FOS=3. **(08)**

OR

B) A square pile group of 16 piles penetrates through a filled up soil of 3 m depth. The pile diameter is 250 mm and pile spacing is 750 mm. the unit cohesion of the material is $18kN/m^2$ and unit weight of soil is $15kN/m^3$. Compute negative skin friction of the group. **(08)**

Q.4 A) Write short note on seismic refraction method. **(07)**

OR

A) Differentiate between general shear failure and local shear failure. **(07)**

B) Describe pneumatic caisson in detail. **(08)**