**Roll No** .....

# MVCT/MBCT/MVCP-103

## M.E./M.Tech., I Semester

Examination, December 2014

## Advanced Geotechnical Engineering

***Time : Three Hours***



***Maximum Marks : 70***

*Note:* i) Solve any five questions.
ii) All questions carry equal marks.
iii) Data missing and found necessary may be suitable assumed.

1. Discuss the various methods of geophysical exploration along with their limitations.

2. Derive the expression for vertical stresses at any point P under a strip load if the point is below the centre of the strip.

3. Briefly describe various types of coffer dams with appropriate diagrams.

4. a) Determine the expression for Natural Frequency.
   b) Determine the natural frequency of a machine foundation having a base area 2m x 2m and a mass of 15 Mg, including the mass of the machine . Taking $C_u = 4x10^4$ kN/m$^3$.

5. Derive the expression for Forced Vibration.



6. A single under reamed pile is installed in a soft clay deposit. The centre of the underream is located at a depth of 15 m from the ground surface. The diameters of the pile shaft and bulb are respectively 1.0 m and 2.5 m. Determine the allowable load with a factor of safety of 2.5. The undrained shear strength of the soil obtained from the vane shear test is given by the relation $c_u = 65+7D$ , where $c_u$ is in kN/m$^3$ and D is depth in meters. Assume $\alpha = 1.0$.

7. What are the various Laboratory tests for determination of strength of rocks. Explain any one in detail.

8. Write short notes on any four of the following:
   a) CNS Layer Techniques.
   b) Tilt and Shift in Well.
   c) Caissons.
   d) Collapsible Soils.
   e) Force Transmissibility
   f) Damping.

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