DEPARTMENT OF CIVIL ENGINEERING

MINOR I :CVL 861 ANALYSIS AND DESIGN OF MACHINE FOUNDATIONS (2017-18)

Time allowed: 1hour
Venue : LH 310
Date : 07 February 2018
Max marks : 15

NOTE: (a) This question paper contains two questions and one page only. (b) All questions are compulsory. (c) **Assume any data which you deem is necessary but not supplied. (d)** Draw neat and clear sketches wherever required.

Question 1.

While designing a foundation, explain why do we consider "net" pressure and not "gross" pressure.

(2 marks)

Question 2.

Check the adequacy of a machine foundation against sliding if the foundation base is 2x2x0.5 m in size, located 1 m below the ground level. Water table starts 0.5 m below the ground level. The machine rests on a pedestal 0.6x0.6 m in size, protruding 0.6 m above the ground level, and exerts a peak horizontal force of 50 kN.

(4 marks)

Question 3.

A reciprocating machine weighing 200 kg and operating at a frequency of 60 Hz rests on an RC block of 2x2 m plan dimensions and 1 m in thickness, with its bottom located 0.8 m below the ground level. The mass of the piston is 0.75 kg and it undergoes a motion in vertical plane with an amplitude of 0.5 m. The soil underlying the foundation has a C_z equal to 27000 kN/m^3. The manufacturer of the machine has specified a safe vibration amplitude of 100 μm. Check the adequacy of the machine foundation from point of view of resonance and the amplitude of vertical vibration.

(7 marks)

Question 4.

What is LVDT? State its working principle.

(2 marks)