DEPARTMENT OF CIVIL ENGINEERING

MINOR II :CVL 861ANALYSIS AND DESIGN OF MACHINE FOUNDATIONS (2016-17)

Time allowed: 1hour   **Date**   : 24 March 2017
Venue   : LH 605   **Max marks**   : 20

NOTE: (a) This question paper contains three questions and one printed 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.

Determine the vertical stiffness of an RC pile of 600 mm diameter and 25 m length embedded in soft clay, likely to support a superimposed weight of 100 kN. The grade of concrete is M 25. What will be the capacity if the pile were resting on a hard rock instead?
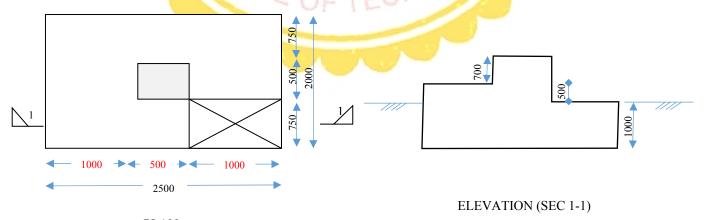
(05 marks)

Question 2.

Determine the transmissibility offered by four rubber pads of size 30x30x10 cm of shore hardness 50° supporting a machine foundation block of dimensions 2x2x1 m which in turn supports a reciprocating machine (operating in vertical plane) operating at 25 Hz. Assume 5% overall damping.

(05 marks)

Question 3.

A block foundation shown in the figure below (all dimensions in mm) supports a machine rotating in horizontal plane operating at an RPM of 3000. The machine itself is 600 kg and is located on the top of the pedestal. It has an eccentric mass of 2 kg rotating in a horizontal radius of 500 mm. The soil has a C_z equal to $4x10^4$ kN/m². Determine the adequacy of the foundation with regard to frequency and vibrational amplitude as per IS 2974.

(10 marks)

PLAN

ELEVATION (SEC 1-1)