



**DEPARTMENT OF CIVIL ENGINEERING**

**MINOR II :CVL 861ANALYSIS AND DESIGN OF MACHINE FOUNDATIONS (2018-19)**

**Time allowed:** 1 hour  
**Venue** : LH 510

**Date** : 28 March 2019  
**Max marks** : 15

**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 bending stiffness of a group of four RC piles of 500 mm diameter and 15 m length arranged at corners of a 1 m square, first embedded in soft clay and then resting on a hard rock. The pile group is supporting a superimposed weight of 1000 kN. The grade of concrete is M 20.

**(04 marks)**

**Question 2.**

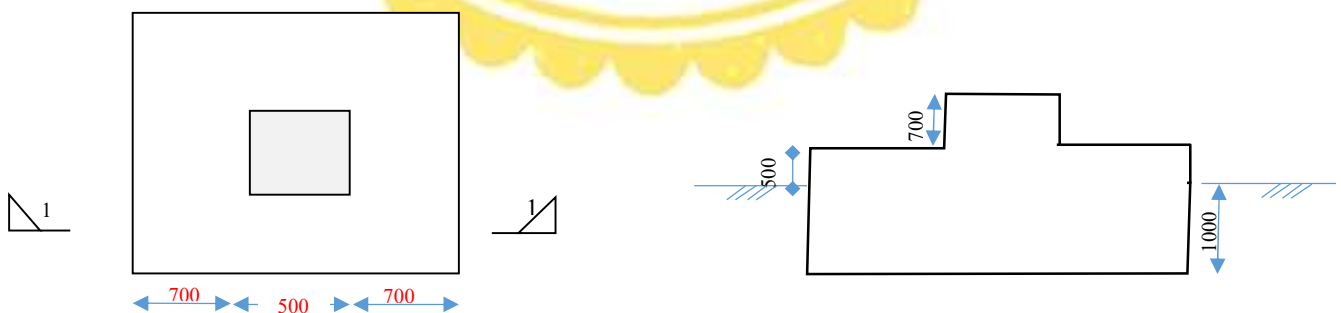
Determine the transmissibility offered by eight rubber pads of size 30x30x50 cm of shore hardness 45° supporting a machine operating at 20 Hz and weighing 3000 kg. Assume 10% overall damping.

**(04 marks)**

**Question 3.**

A square block foundation-pedestal system shown in the figure below (all dimensions in mm) supports a reciprocating machine operating at an RPM of 2500 in horizontal direction. The machine itself is 2000 kg and is located on the top of the pedestal. It has an eccentric mass of 2 kg vibrating with an amplitude of 500 mm. The soil has a  $C_z$  equal to  $6 \times 10^4$  kN/m<sup>2</sup>. Determine the adequacy of the foundation with regard to frequency and vibrational amplitude as per IS 2974.

**(7 marks)**



PLAN

ELEVATION (SEC 1-1)