Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Summer 2018 - 19 Examination

Semester: 2 **Date: 06/05/2019**
Subject Code: 203215152 **Time:10:30 to 01:00pm**
Subject Name: DYNAMICS OF SOILS AND FOUNDATIONS **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) Define: i) Natural frequency ii) Period iii) Forced Vibration iv) Degree of freedom v) Damping Ratio **(05)**

B) Two linear springs k_1 and k_2 are connected in series attached to rigid mass m and subjected to free vibration with natural period of 5 seconds. The same springs when connected in parallel with the same block gives natural period of 2 seconds. Compute ratio of spring constant. **(05)**

C) Assuming resonance to have occurred at a frequency of 30 cycles/sec in a vertical vibration of a test block 1m × 1m ×1m , determine the coefficient of elastic in compression. The weight of the oscillator is 800 N and the force produced by it after 15 cycles is 1500 N. Compute the maximum amplitude in the vertical direction at 15 cycles per sec. weight of test block is 24kN/m^3. **(05)**

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

A) Discuss about the different types of vibrating machines and suitable types of machine foundation for each machine type.

B) What do u mean by vibration isolation? Discuss different systems adopted for vibration isolation.

C) Define Seismograph and Describe Body waves in brief.

D) Summarize the design criteria for machine Foundation.

Q.3 A) Enlist different types of tests used to determine dynamic soil properties and describe any one in detail. **(07)**

B) Explain Elastic half space method for analysis of machine foundation. **(08)**

OR

B) Explain Simplified procedure for liquefaction. **(08)**

Q.4 A) How to evaluate liquefaction potential using standard penetration test? **(07)**

OR

A) Derive the equation of motion and its solution for undamped free vibration. **(07)**

B) Define Liquefaction and describe all the factors affecting liquefaction in detail. **(08)**