Code No: **R42018** **R10** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2016

SOIL DYNAMICS AND MACHINE FOUNDATIONS

(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) What is 'Logarithmic Decrement'? Derive expressions for its determination. [8]

b) What is viscous damping? Explain the effect of damping on amplitude of vibrations. [7]

2 a) Determine the natural frequency of a machine foundation that has a base area of $6m^2$ and a weight of 175kN including weight of machine. The coefficient of elastic uniform compression of soil is 4×10^4 kN/m^3. Use Barkan's method. [8]

b) Describe the Pressure bulb concept used in determination of mass of co-vibrating soil for determination of natural frequency of foundation-soil system. [7]

3 a) Describe cyclic plate load test used in determination of coefficient of elastic uniform compression of soils [7]

b) A block vibration test was performed on a concrete block of size 1m x 1m x 1m using vertical excitation. The results are tabulated. Assuming unit weight of concrete as 24 kN/m^3, determine the value of damping Factor (D).

Frequency (rpm)	500	600	700	750	850	950	1000	1200
Amplitude (mm)	0.2	0.6	1.5	2.5	3.2	2.5	1.5	0.6

[8]

4 a) Distinguish between Longitudinal and torsional vibrations of elastic rods. [8]

b) Describe the different types of waves that propagate through semi infinite elastic medium. [7]

5 a) Explain dynamic bearing capacity theory of soils. [8]

b) What are the considerations involved in design of pile foundations subjected to dynamic loads? [7]

6 a) How do you analyse the rocking vibrations of block foundation? [8]

b) Describe the codal provisions for design and construction of Impact Machines. [7]

7 a) What are the considerations in seismic stability analysis of slopes? [7]

b) Describe the method of slices used in stability analysis of finite slopes. [8]

8 a) What are the different methods of vibration isolation? [8]

b) Describe different materials used for vibration isolation. Discuss relative merits and demerits. [7]