

Code No: RT42014A

R13

Set No. 1

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018

SOIL DYNAMICS AND MACHINE FOUNDATIONS

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Define SHM with examples. [4]
- b) Write a short note on lumped parameter model. [4]
- c) What are dynamic properties of soils define them? [4]
- d) What are the general requirements for the design of machine foundation? [3]
- e) What are the design criteria for impact foundation? [3]
- f) What a short note on dynamic bearing capacity? [4]

PART-B (3x16 = 48 Marks)

2. a) Obtain the equation of motion for critically damped system. [8]
- b) Derive the expression for equivalent stiffness of springs in series and parallel. [8]
3. a) Determine the natural frequency of a machine foundation that has a base area of 6m² and a weight of 175kN including weight of machine. The coefficient of elastic uniform compression of soil is 4×10^4 kN/m³. Use Barkan's method. [8]
- b) Explain Hsiegn's equation for vertical vibrations. [8]
4. What are the laboratory methods used to determine the dynamic properties of soils? Explain them in brief. [16]
5. a) What is the data required for carrying out design of machine foundations? [6]
- b) Write a brief note on IS code provisions for the design foundations of reciprocating machines. [10]
6. a) Describe the codal provisions for design and construction of Impact Machines. [8]
- b) What is the data required for carrying out design of impact machines write a brief note on it. [8]
7. a) Write a detailed description of vibration isolation and isolation materials. [8]
- b) Write a brief note on liquefaction of soils and Factor of safety against liquefaction. [8]