Code No: RR410105 **Set No. 1**

IV B.Tech I Semester Regular Examinations, November 2005
SOIL DYNAMICS AND MACHINE FOUNDATION
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Classify machine foundations according to I.S.Code with neat sketches [8]
   (b) Discuss the values of permissible amplitudes suggested by B.I.S for the foundations of different types of machines. [8]
2. (a) Distinguish between the two types of excitation [8]
   (b) Spilt up the harmonic motion:
   X= 8Sin(ωt+Π/4) into two harmonic motions, one of which has an amplitude of 10 and phase difference zero. [8]
3. (a) Discuss Tschebotarioffs reduced natural frequency. [8]
   (b) Describe the factors affecting co-efficient of elastic uniform compression. [8]
4. (a) Why is vibration isolation required [8]
   (b) What do you understand by active isolation and passive isolation. [8]
5. What are the laboratory methods used to determine the dynamic properties of soils? Explain them in brief. [16]
6. (a) Elucidate briefly Pauws analogy of foundation soil system. [8]
   (b) Explain: [8]

   (a) Viscous damping and
   (b) Logarithmic decrement
7. (a) How do you analyse a block foundation based on elastic half-space theory? [8]
   (b) Explain Quinlan and Sungs modifications. [8]
8. (a) What are the factors to be considered in the design of block foundations for reciprocating foundation? [8]
   (b) Draw the models for analysis of impact type machines, according to I.S.code. What are their limitations? [8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR410105 **Set No. 2**

IV B.Tech I Semester Regular Examinations, November 2005
SOIL DYNAMICS AND MACHINE FOUNDATION
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) What is the data required with regard to machines for designing machine foundations. [6]
   (b) Classify the machines based on the design criteria and operating systems [10]
2. (a) What do you understand by over damped, critically damped and under damped systems. [6]
   (b) Derive an expression for logarithmic decrement in terms of damping factor. [10]
3. (a) Discuss Tschebotarioffs reduced natural frequency. [8]
   (b) Describe the factors affecting co-efficient of elastic uniform compression. [8]
4. Discuss methods of vibration isolation in machine foundation [16]
5. (a) Explain the field test by Wave propagation technique for the method of evaluation of shear modulus of soil. [6]
   (b) What is a cyclic plate load test? Explain the method of evaluation of coefficient of elastic uniform compression of soil. What are the factors that influencing the coefficient of elastic uniform compression. [10]
6. (a) What is apparent soil mass? Explain how Pauw used this concept to arrive at the natural frequency of a machine foundation soil system? [10]
   (b) What is a bulb of pressure concept? [6]
7. (a) What are the modifications made by Quinlan and Sung to Reissners theory? Explain. [10]
   (b) Explain Hsiegns equation for vertical vibrations. [6]
8. (a) What are the factors to be considered in the design of block foundations for reciprocating foundation? [8]
   (b) Draw the models for analysis of impact type machines, according to I.S.code. What are their limitations? [8]

⋆ ⋆ ⋆ ⋆ ⋆

IV B.Tech I Semester Regular Examinations, November 2005
SOIL DYNAMICS AND MACHINE FOUNDATION
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Classify machine foundations according to I.S.Code with neat sketches [8]
   (b) Discuss the values of permissible amplitudes suggested by B.I.S for the foundations of different types of machines. [8]
2. (a) A mass of 10kg when suspended from a spring, causes a static defection of 1 cm. Find the natural frequency of the system. [8]
   (b) An instrument has a natural frequency of 10Hz. It can stand a maximum acceleration of 10m/sec2. Find the maximum displacement amplitude. [8]
3. (a) Discuss Tschebotarioffs reduced natural frequency. [8]
   (b) Describe the factors affecting co-efficient of elastic uniform compression. [8]
4. Discuss methods of vibration isolation in machine foundation [16]
5. (a) Describe with a neat sketch, a block vibration test according to I.S. code under vertical vibrations and explain its use. [10]
   (b) The coefficient of elastic uniform compression of a soil is found to be 24,000 kN/m^3 using a plate of diameter 4 m. What will be the percentage variation in its value, if the diameter of the plate is halved? [6]
6. (a) Elucidate briefly Pauws analogy of foundation soil system. [8]
   (b) Explain: [8]

   (a) Viscous damping and
   (b) Logarithmic decrement
7. (a) How do you analyse a block foundation based on elastic half-space theory? [8]
   (b) Explain Quinlan and Sungs modifications. [8]
8. (a) List the basic differences in analyzing a reciprocating machine foundation by the two approaches namely [8]
      i. Linear weightless spring-mass system, and
      ii. Elastic half-space theory.
   (b) Derive the expressions of natural frequency and amplitude of a block foundation subjected to vertical vibration. [8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR410105 **Set No. 4**

IV B.Tech I Semester Regular Examinations, November 2005
SOIL DYNAMICS AND MACHINE FOUNDATION
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Classify machine foundations according to I.S.Code with neat sketches [8]
   (b) Discuss the values of permissible amplitudes suggested by B.I.S for the foundations of different types of machines. [8]
2. Starting from fundamentals, obtain the equations of motion for over damped, critically damped and under damped systems. [16]
3. Calculate the change in percentage of amplitude in terms of frequency ratio if the soil mass participating in the vibration is 25% of the mass of machine and foundation. Use Barkens formula with and without taking into account the soil mass vibrating. [16]
4. (a) Describe vibration Isolation by use of Structural measures. [8]
   (b) Explain the properties of Felt and Rubber as Isolation materials. [8]
5. What are the laboratory methods used to determine the dynamic properties of soils? Explain them in brief. [16]
6. (a) What is apparent soil mass? Explain how Pauw used this concept to arrive at the natural frequency of a machine foundation soil system? [10]
   (b) What is a bulb of pressure concept? [6]
7. (a) What is quinlan and sung modifications. [8]
   (b) Discuss Hsieghs equations for vertical vibration. [8]
8. Give an account of I.S.code of practice for the design of foundations for impact type machines. [16]

⋆ ⋆ ⋆ ⋆ ⋆