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BICEE-013

B.Tech. CIVIL ENGINEERING (BTCLEVI)

00853

Term-End Examination

December, 2016

BICEE-013 : ELEMENTS OF SOIL DYNAMICS AND MACHINE FOUNDATION

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. All questions carry equal marks. Assume missing data, if any. Use of scientific calculator is permitted.*

1. What is damping factor ? How is it determined for a single degree of freedom system ? *14*

2. A machine having total weight of 19 MN has an unbalance such that it is subjected to a force of magnitude 5 MN at a frequency of 500 rpm. What should be the spring constant for the supporting springs, if the maximum force transmitted into the foundation due to the machine is to be 0·5 MN ? The damping can be ignored. *14*

3. Discuss vertical block resonance test to determine the coefficient of uniform elastic compression. What are the factors affecting it ? *14*

4. Discuss the design steps for the design of a block foundation. *14*

5. Explain the resonance method for finding the vertical frequency of rotary machines. *14*

6. Describe the method of obtaining the maximum horizontal dynamic load that can be applied on the footing. Write the expression for finding the rotation of the footing. *14*

7. A 6 m high retaining wall with backface inclined 20° with the vertical retains sand. The surcharge angle of backfill surface is 10° with the horizontal. Find the total active earth pressure using Mononobe's equation.

   The data given are :

   Angle of shearing resistance = 33°

   Bulk density of sand = 18 kN/m^3

   Angle of wall friction = 20°

   Coefficients of horizontal and vertical acceleration are 0·1 and 0·05 respectively. *14*

8. Discuss wave propagation in elastic half space. *14*
