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BICEE-013

B.Tech. IN CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00805

December, 2014

BICEE-013 : ELEMENTS OF SOIL DYNAMICS AND MACHINE FOUNDATION

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. Assume missing data, if any. All questions carry equal marks. Scientific calculator is allowed.*

1. (a) Define Machine foundation. Write the various types of machine foundations with suitable sketches. *7*

(b) Discuss the various types of dynamic loading on soils, with emphasis on the nature of the source producing the load. *7*

2. The foundation of a gas engine with a vertical cylinder and vertically oscillating parts has the following data :

Total weight of the engine = 50 kN

Speed of rotation = 300 r.p.m.

Weight of the block = 250 kN

Weight of participating soil = 200 kN

Spring stiffness = 60×10^4 kN/m

Determine the natural frequency. *14*

3. (a) Why is vibration isolation required ? Describe the various methods of vibration control. 7

(b) Why is it difficult to control low frequency vibrations ? 7

4. (a) Write the various effects of dynamic loads on bearing capacity and earth pressure. 7

(b) Briefly explain Barkan's method of machine foundation design. 7

5. Discuss various design criteria for the design of foundation of impact type machines as per I.S. Code. 14

6. Discuss the various types of retaining wall failures due to seismic forces. Explain briefly the effect of water on wall pressures. 14

7. What are the characteristics of seismic waves ? Explain the various types of seismic waves with suitable sketches. 14

8. A retaining wall 10 m high, retains a cohesionless soil with an angle of internal friction 35°. The surface is in level with the top of the wall. The unit weight of the top 3 m of the fill is 1·6 t/m^3 and that of the rest is 2·0 t/m^3. Find the magnitude and application of resultant active thrust. 14
