

B.Tech. IN CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00625

December, 2014

BICEE-022 : ADVANCED DESIGN OF FOUNDATION

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **seven** questions. Assume suitable data if required. Use of scientific calculator is permitted.*

1. (a) Write down the various limitations of Winkler's Model and Hetengi's Model for beam elastic solution. 5
- (b) A concrete pile, 30 cm square and 5 m long, is subjected to a horizontal load of 500 N, and the moment of 400 N-m at the ground level. Taking the $\eta_n = 20 \text{ N/cm}^3$, find the maximum deflection if the head of the pile is considered to be free. 5
2. (a) Explain in brief the design of single wall coffer dams with suitable sketches. 5
- (b) Discuss the various types of sheet piles and its uses. 5
3. (a) Explain the cellular stability of cellular coffer dams with an example. 5
- (b) Discuss the various types of coffer dams with suitable sketches. 5

4. A coffer dam is to be constructed of cantilever sheet piling. It has to retain a soil bulk density of 2.3 g/cc and the angle of internal friction of 33° , up to a height of 5 m . Find the depth to which the piles should be driven, assuming that two-third of the theoretical passive resistance is developed on the embedded length. 10
5. (a) Briefly explain Barkan's Method of machine foundation design. 5
- (b) Discuss the use of single degree freedom system in the analysis of machine foundation. 5
6. (a) How do you determine the mass spring constant and damping factor for a vibrating system? 5
- (b) Discuss the design criteria for the design of foundation of impact type machine as per B.I.S. Code. 5
7. (a) Illustrate different types of shell foundations with neat sketches. 5
- (b) Give the special features of shell foundation for silos and chimneys. 5
8. (a) Draw a pressure distribution diagram of cantilever sheet pile in purely cohesive soils. 5
- (b) What do you mean by Arching of soil and its uses on the design of the flexible anchored sheet pile walls? 5

9. (a) Based on Winkler's Model, give the classic solution for beam of infinite length subjected to central concentrated load. 5
- (b) Describe the free and forced vibration for single degree of freedom without damping. 5
10. Explain any *two* of the following terms : $2 \times 5 = 10$
- (a) Cantilever sheet pile walls
- (b) Modulus of Subgrade Reaction
- (c) Condition of piping in coffer dams
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