B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

00015   ## June, 2014

BICEE-022 : ADVANCED DESIGN OF FOUNDATION

Time : 3 hours   *Maximum Marks : 70*

*Note : Attempt any **seven** questions. Each question carries equal marks. Assume suitable data if required. Use of scientific calculator is permitted.*

1. (a) Differentiate between a cantilever and anchored sheet pile wall. Draw the pressure distribution diagram showing forces for which each should be designed.   5

    (b) Distinguish between single wall and double wall cofferdams with neat sketch.   5

2. (a) What do you mean by Arching of soil and its use on the design of the flexible anchored sheet pile walls ?   5

    (b) Explain the cellular stability of cellular cofferdams.   5

3. (a) Explain the different types of forces which act on cofferdams.   5

    (b) Write the various types of cofferdams with suitable sketches.   5

4. A cofferdam 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 by the embedded length. *10*

5. (a) Briefly explain Barken'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) Why is vibration isolation required ? Describe various methods of vibration control. *5*

(b) Why is it difficult to control low frequency vibrations ? *5*

7. (a) Illustrate different types of shell foundations with neat sketches. *5*

(b) Explain special features of shell foundations for water tank. *5*

8. (a) A concrete pile, 30 cm square and 5 m long is subjected to a horizontal load of 500 kN and the moment of 4000 t.m at the ground level. Taking $\eta_n = 20$ N/cm^3, find maximum deflection if the head of the pile is considered to be free. *5*

(b) Based on Winkler's Model, give the classic solution of beam of finite length subjected to central concentrated load. *5*

9. (a) Discuss the Winkler's assumption for laterally loaded piles. *5*

(b) Describe the Free and Forced vibration of single degree of freedom without damping. *5*

10. Explain the following terms briefly : $2\frac{1}{2} \times 4 = 10$

(a) Modulus of Subgrade Reaction

(b) Contact Pressure distribution beneath the rigid footing

(c) Filonenko-Borodich Model

(d) Gravity structure

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