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BICEE-022

B.Tech. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

December, 2017

00512

BICEE-022 : ADVANCED DESIGN OF FOUNDATION

Time : 3 hours *Maximum Marks : 70*

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

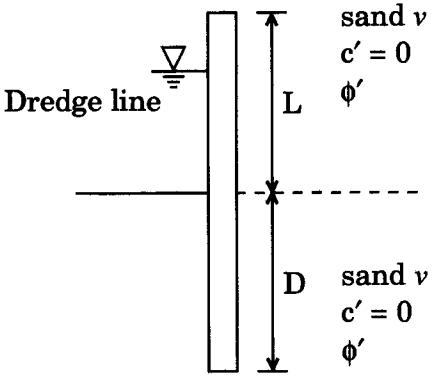
1. Explain the types and uses of sheet piles. Describe the methods of design of cantilever sheet pile walls and anchored sheet pile walls. *14*

2. The figure shows a cantilever sheet pile wall penetrating a granular soil.

   $\nu = 15{\cdot}9\ kN/m^3$, $\phi' = 32°$, $L = 5\ m$

   (a) What is the theoretical depth of embedment, 'D' of the sheet pile ?

(b) What is the total length of the sheet pile considering 30% increase in the value of 'D' ? *14*



3. The resonant frequency of a block foundation, excited by an oscillator is observed as 20 Hz. The amplitude of vibration at resonance is 1 mm. The magnitude of the dynamic force at 20 Hz is 5 kN. If the total weight of the block and oscillator is 20 kN, calculate the damping factor associated with the vibration of the block. *14*

4. Derive the basic equation of a beam resting on elastic foundation. Mention its applications. *14*

5. Explain the different modes of vibration of a foundation block subjected to dynamic forces from a machine. Give the characteristics of different types of damping. *14*

6. Explain the two-parameter models for soil structure interaction. *14*

7. Write the special features of the foundations for a water tank. Explain the general principle of design of shell foundations. *14*
