Roll No. .....

24380

B. Tech. (Civil) 6th Semester Examination – May, 2015

GEOTECHNOLOGY

Paper : CE-306-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. 1 is ***compulsory***. All questions carry equal marks. Assume missing data, if any, suitably.

1. Explain the following : 20

(a) Slope stability of earth dam

(b) Taylor' stability number

(c) Difference between coffer dam and bulkhead

(d) Inter-lock stresses

(e) Types of sheet piles and their uses

(f) Method of grouting and its types

(g) Resonant frequency and natural frequency

(h) Necessity of soil stabilization

SECTION – A

2. (a) Describe the friction circle method for the stability analysis of slopes. Also explain the uses of stability chart. 10

(b) Describe the slope stability of earth dam during steady seepage. 10

3. (a) How a slope is analysed using Swedish circle method. Derive an expression for the factor of safety. 10

(b) Derive an expression for the factor of safety of an infinite slope in a cohesionless soil. 10

SECTION – B

4. (a) What is coffer dam ? Name the different types of coffer dams and discuss their relative advantages and disadvantages. 10

(b) Compare the circular type and diaphragm type cellular coffer dam in detail. 10

5. (a) Draw different types of apparent pressure diagrams used in braced cuts. What are the factors that affect the pressure distribution ? 10

(b) Define sheeting and bracing system. Describe the different types of sheeting and bracing system. 10

SECTION – C

6. An anchored sheet pile retains soil to a height of 8 m. determine the depth of embedment for anchored sheet pile with fixed earth support method if $\Phi = 30°$, $\gamma = 19$ kN/m^3. Also determine the anchor force per unit length. 20

7. (a) Derive an expression for depth of embedment of cantilever sheet pile in cohesionless soil. 10

(b) What are different types of retaining walls ? What are the different methods for estimating lateral earth pressure acting on the walls ? 10

SECTION – D

8. (a) What is meant by vibration isolation? Describe it in detail. 10

(b) Briefly explain Barken's method for determining natural frequency of a block foundation subjected to vertical oscillations. 10

9. (a) What is mechanical stabilization? What are the factors that affect the mechanical stability of mixed soil ? 10

(b) Write short note on the following : 10

(i) Reinforced earth

(ii) Bitumen stabilization
