(b) What is mechanical stabilization ? Explain the factors that affect the mechanical stability of mixed soil.     10

9. Define the following terms related to machine foundations :

(a) Characteristic elements of a vibratory systems

(b) Undamped free and forced vibrations

(c) Criteria for satisfactory action of a machine foundation

(d) Barken's method for determining natural frequency of a block foundation.     20

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**B.Tech 6th Semester (Civil) F-Scheme**

**Examination, May–2017**

**GEOTECHNOLOGY**

**Paper–CE-306-F**

*Time allowed : 3 hours]*     *[Maximum marks : 100*

*Note :* (i) *Attempt five questions in all. Question No.1 is compulsory. Attempt one question from each section.*

(ii) *All questions carry equal marks.*

(iii) *Assume missing data, if any, suitably.*

1. Explain the following :     20

(a) Slope stability of earth dam

(b) Taylor's stability number

(c) Difference between circular and diaphragm type cellular coffer dam

(d) Types of sheet piles

(e) Resonant frequency

(f) Soil stabilization

(g) Vibration isolation

(h) Uses of admixtures

(i) Types of machine foundation

(j) Factor of safety used in stability of slopes

## Section-A

2. (a) Describe the different types of earthen dam. Also explain the preventive measures to control the seepage through foundations of earthen dams.   10

(b) What are the causes of failure of earthen dams? Explain briefly the criteria for safe design of earthen dams.   10

3. (a) What do you mean by stability analysis of slopes? Describe the stability of infinite slopes.   10

(b) Explain Fellinius method to locate centre of most critical slip circle.   10

## Section-B

4. (a) What is the necessity of braced cuts? Describe the different modes of failure of braced cuts.   10

(b) Explain the different types of sheeting and bracing systems. Also describe the pressure distribution behind sheeting.   10

5. (a) Describe the design and lateral stability of braced cofferdams.   10

(b) What is coffer dam? Explain the different types of coffer dams with their advantages and disadvantages.

## Section-C

6. (a) Determine the depth of embedment by free earth support method for an anchored sheet pile wall penetrating granular soil and supporting a backfill of same material to a height of 8 m. The tie rods are placed at a depth of 2.5 m below the top. Take $\gamma = 16$ kN/m$^3$ $\Phi = 35°$.   15

(b) What is sheet pie? Differentiate between cantilever and anchored sheet pile.   5

7. 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

## Section-D

8. (a) What do you mean by soil improvement? Describe grouting and reinforced earth methods in detail.   10