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# **B.TECH.**

# THEORY EXAMINATION (SEM–VI) 2016-17 ADVANCED FOUNDATION DESIGN

Time : 3 Hours

Max. Marks : 100

 $10 \ge 2 = 20$ 

 $5 \ge 10 = 50$ 

*Note* : Be precise in your answer. In case of numerical problem assume data wherever not provided.

# SECTION – A

## **1.** Attempt the following:

- (a) What are the types of soil samples used in soil exploration?
- (**b**) Define significant depth?
- (c) What do you infer by the term ultimate bearing capacity?
- (d) Name the different types of settlements?
- (e) Mention the functions of pile foundations?
- (f) Discuss about negative skin friction?
- (g) Draw a neat sketch of well foundation and mention its components?
- (h) On what basis will you select the depth of well foundation?
- (i) List out the types of failure of a finite slope?
- (j) Give the basic data required for design of reciprocating type machine?

### SECTION – B

#### 2. Attempt any five of the following questions:

- (a) Discuss on different types of borings for soil exploration?
- (b) Elaborate on the standard penetration tests and static cone test in a detailed manner?
- (c) Briefly explain about the settlement analysis of shallow foundations by Meyerhof method?
- (d) A square footing 1.5m X 1.5m is located at a depth of 1m. The soil has the following properties.  $\gamma = 17.5$  KN/m<sup>3</sup>, C=0 and  $\varphi = 35^{0}$ . Using Hasen's method to compute the ultimate bearing capacity of the soil. The footing base and ground are horizontal.
- (e) (i) A wooden pile is being driven with a drop hammer weighing 20KN and having a free fall of 1m. The penetration in the last blow is 5mm. Find the safe load carrying capacity of the pile using the Engineering News formula?
  - (ii) How will you determine the efficiency of pile group?
- (f) Describe about well sinking? What are the measures employed in controlling well sinking?
- (g) Discuss on under reamed pile foundation. Also give the expression for load carrying capacity for clayey soil and sandy soil?
- (h) Write the procedure to calculate the factor of safety of a finite slope using method of slices?

#### SECTION – C

#### Attempt any two of the following questions:

- **3.** (a) Explain about the seismic refraction method and electrical resistivity method of soil exploration?
  - (b) Discuss the schmmertman's method of determining settlement of footings in cohesionless soils?

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#### $2 \ge 15 = 30$



FirstRanker.com 15m long piles of600mm dia in soft clay having an average undrained strength of 50 KN/m<sup>2</sup> if the c/c pile spacing is

- (i) Two times pile dia (ii) Three times pile dia
- Elaborate with a neat sketch the type of foundation used in case of expansive soils? **(b)**
- 5. Outline the methods available for the analysis of finite slopes. Explain with neat sketches the steps involved in the Bishop's simplified method for analyzing the stability of slopes?

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