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B.TECH.

THEORY EXAMINATION (SEM–VI) 2016-17

ADVANCED FOUNDATION DESIGN

Time : 3 Hours *Max. Marks : 100*

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

SECTION – A

1. Attempt the following: **10 x 2 = 20**

(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: **5 x 10 = 50**

(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. γ =17.5KN/m^3 , 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: **2 x 15 = 30**

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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4. **(a)** Compute the pile group capacity of 16 pile group in square arrangement made up of 15m long piles of600mm dia in soft clay having an average undrained strength of 50 KN/m^2if the c/c pile spacing is

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(i) Two times pile dia (ii) Three times pile dia

(b) Elaborate with a neat sketch the type of foundation used in case of expansive soils?

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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