

TCE-603

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Paper Code & Roll No. to be filled in your Answer Book

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**B.Tech. (VI - Sem.)**

Even Semester Examination - 2016

**FOUNDATION ENGINEERING**

*[Time : 3 Hours]*

*[Maximum Marks :100]*

**Note:** Attempt All Questions

Q1 Attempt any four parts. (5x 4=20)

- (a) Define soil exploration.
- (b) Explain different types of shear failures with suitable diagrams.
- (c) Define standard penetration test explaining its application in foundation engineering.
- (d) Give important parameters to fix the significant depth of exploration.
- (e) Differentiate critically the classical earth pressure theory of Rankine and Coulomb.

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(1)

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Q 2 Attempt **any four** parts. (5x4=20)

- (a) Define the Net safe bearing capacity and gross safe bearing capacity.
- (b) If unconfined compressive strength in natural clay is 200 kpa. Find out the sensitivity of clay.
- (c) What are the considerations in increasing the depth of foundation?
- (d) What is shallow foundation? Explain its types.
- (e) Discuss the procedure for proportioning of footing for equal settlement.

Q 3 Attempt **any four** parts. (5x4=20)

- (a) Discuss any two dynamic formulae. What are their limitations?
- (b) What is penetrometer test? Describe any two types in brief.
- (c) Determine the group capacity of a pile group consisting of 10 piles (300 mm dia) arranged in 2 rows, if the piles are driven 8m into clay with  $c=25 \text{ KN/m}^2$  and pile spacing =0.8 m.
- (d) A single acting steam hammer weighing 2000 N and falling through a height of 80 cm drives a pile to an average penetration of 1 cm per

under the last few blows. Determine the allowable load for the pile.

(e) Discuss in brief types of samplers.

Q 4 Attempt **any two** parts. (10x2 = 20)

(a) Describe the procedure for construction of wells. Discuss the causes and remedies for tilts and shifts.

(b) The cone penetration resistance obtained in a clay soil in a CPT was  $50 \text{ Kg/cm}^2$ . Determine the un-drained strength of the clay. The total overburden pressure at a depth was 100 kpa.

(c) Distinguish between the total and effective stress approaches of stability analysis. Indicate the advantages and shortcomings of the total stress approach.

Q 5. Attempt **any two** parts. (10x2=20)

(a) What are the situations where a pier or caisson may be used for foundation? Draw a neat sketch of well foundation and describe the problems associated with sinking of well.

(b) What are the various tests by which soil spring constants can be estimated? Discuss any two tests.



- (c) Determine the ultimate bearing capacity of a strip footing 1.5m wide, with its base at a depth of 1m. if the water table is located at a depth of 0.5 m below the ground surface. Take saturated unit weight = 20 KN/m<sup>3</sup>, angle of internal friction= 38, and c=zero,  $N_q= 48.9$ ,  $N_y=64$ .

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