Total No. of Questions : 8]

SEAT No. : [ ]

PA-906

[Total No. of Pages : 2

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B.E. (Civil Engg.)

FOUNDATION ENGINEERING

(2019 Pattern) (Semester - VII) (401001)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q.7 or Q.8.***
2) ***Figures to the right indicate full marks.***

Q1) a) Explain the following terms: **[5]**

i) Coeff. of Compressibility

ii) Compression Index

iii) Coefficient of volume Compressibility

iv) Degree of Consolidation

v) Coeff. of Consolidation.

b) Draw contact pressure diagram for surface and deep footing in clay for flexible and rigid footing **[6]**

c) An oedometer test gives time for 90% consolidation as 16 minutes on a 20 mm thick specimen (double drainage). Determine the time required for 50% consolidation for a clay bed 3m thick with single face drainage. **[6]**

OR

Q2) a) Discuss with sketch, logarithm of time fitting method for determination of coefficient of consolidation. **[5]**

b) Explain the following terms: **[6]**

i) Normally consolidated soil

ii) Pre consolidated soil

iii) Under consolidated soil.

c) The overburden pressure at the middle of 7.5 mm thick clayey layer increased from 2kg/cm^2 to 3.5kg/cm^2. Find the settlement due to consolidation assuming liquid limit and initial void ratio of the clay as 36% and 0.82 respectively. **[6]**

P.T.O.

Q3) a) Discuss the necessity of pile foundation. **[5]**

b) What is negative skin friction? How it is calculated for single pile embedded in two layers of clay. **[6]**

c) 20 piles are arranged in four rows and five columns. Calculate the efficiency of the pile group by Feld's rule. **[6]**

OR

Q4) a) Explain the procedure for calculation of bearing capacity of single pile by static method? **[5]**

b) Discuss static pile load test. **[6]**

c) A circular pile with 0.35m diameter and 10m length penetrates a deposit of clay having cohesion 5 kN/m^2 and mobilizing factor of 0.8. Calculate the ultimate frictional resistance of the pile. **[6]**

Q5) a) Explain design steps of raft foundation by conventional (rigid) method. **[6]**

b) Draw well foundation and state the function of each component. **[6]**

c) Write a note on **[6]**

i) Uses of caissons

ii) Sand island method

OR

Q6) a) Explain the steps involved in proportioning of isolated footing. **[6]**

b) Define shift and tilt of well foundation. Enlist any four ways to rectify the tilt. **[6]**

c) How the depth of well foundation is decided? Enlist the forces acting on well foundation. **[6]**

Q7) a) Enlist types of coffer dams. Explain any one type with a neat sketch. **[6]**

b) Discuss the design principle of undreamed pile. **[6]**

c) Describe Stone Column Technique with a neat sketch. **[6]**

OR

Q8) a) Discuss preloading with prefabricated vertical drains/sand drains with a neat sketch. **[6]**

b) Explain with a neat sketch the construction method of R.C. diaphragm wall. **[6]**

c) Describe engineering problems associated with black cotton soil. **[6]**