

Total No. of Questions : 8]

SEAT No. :

PA-906

[Total No. of Pages : 2

[5927]-328

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/cm² to 3.5kg/cm². 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/m² 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 cofferdams. 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]