

Total No. of Questions :12]

SEAT No. :

[Total No. of Pages : 3

P1687

[5058] - 307

T.E. (Civil)

FOUNDATION ENGINEERING

(2012 Pattern) (Semester - II) (End Sem.)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer Q. 1 or Q. 2, Q. 3 or Q. 4 and Q. 5 or Q. 6, Q. 7 or Q. 8, Q. 9 or Q. 10 and Q.11 or Q.12.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of logarithmic tables, slide rule, Mollier charts, electronics pocket calculator and steam tables is allowed.*
- 4) *Assume suitable data if necessary.*
- 5) *Neat diagrams must be drawn wherever necessary.*

Q1) Explain Standard penetration test. What are the various corrections? What is the importance of this test in foundation engineering? **[6]**

OR

Q2) The inner diameters of sampling tube and that of cutting edge are 72 mm and 70 mm respectively. Their outer diameters are 74 mm and 76 mm respectively. Determine the inside clearance, outside clearance and area ratio of sampler. **[6]**

Q3) Enlist the assumptions made in Terzaghi's theory for bearing capacity determination and state Terzaghi's equation for bearing capacity with meaning of each term. **[7]**

OR

Q4) Write notes on: **[7]**

- a) Bearing capacity of layered soil,
- b) Effect of depth on bearing capacity,
- c) Effect of eccentricity on bearing capacity.

P.T.O.

Q5) A clay stratum 6 meters thick has initial void ratio of 1.52 and effective overburden pressure of 125 kN/m². When the sample is subjected to increase in pressure of 100 kN/m², the void ratio reduces to 1.45. Determine the coefficient of volume compressibility, compression index and final settlement of stratum. [7]

OR

Q6) Explain with a neat sketch, logarithm of time fitting method for determination of coefficient of consolidation. [7]

Q7) a) Explain pile load test with its limitations. [6]

b) Determine the capacity of pile by using following data. Diameter of pile = 600 mm, length = 7 m, $\phi = 30^\circ$, soil density = 17 kN/m³, $c = 20$ kN/m², reduction factor, $\alpha = 0.5$, $N_c = 65$, $N_q = 35$, $N_\gamma = 18$, factor of safety = 3. [6]

c) Enlist the types of piles according to function. [5]

OR

Q8) a) A group of piles consists of 15 piles arranged in three rows and five columns. Compute the efficiency of pile group by-Felds rule. [5]

b) What is Caission disease? How it is controlled? [6]

c) What do you understand by 'Tilt' and 'Shift'? What are the remedial measures to rectify the same? [6]

Q9) a) Calculate the factor of safety of a cantilever sheet pile with the following details. [5]

i) Length of sheet pile = 8 m.

ii) Depth of embedment = 5 m,

iii) Angle of internal friction of soil = 30° .

b) What is cofferdam? Where they are used? [5]

c) Discuss any three types of cofferdams. [6]

OR

- Q10)**a) Explain ‘vibroflotation technique’ of soil improvement. [5]
b) Explain ‘swelling pressure test’ with neat sketch. [5]
c) State and explain various design principles to be followed during construction of foundation on black cotton soil. [6]

- Q11)**a) What are the advantages and disadvantages of geosynthetics over conventional materials? [6]
b) Explain any three types of geosynthetics. [6]
c) Explain the use of geosynthetics in bearing capacity improvement. [5]

OR

- Q12)**a) What do you mean by ‘Liquefaction’? What are its effects on built environment? [6]
b) Explain different types of seismic waves. [6]
c) Explain how ‘liquefaction susceptibility’ of a soil is determined? [5]

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