

Total No. of Questions : 10]

SEAT No. :

P2919

[Total No. of Pages : 3

[5669]-508

T.E. (Civil) (Semester - II)

FOUNDATION ENGINEERING

(2015 Pattern)

Time : 2.5 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q. No. 1 or Q. No. 2, Q.No. 3 or Q.No. 4, Q.No. 5 or Q.No. 6., Q. No. 7 or Q.No. 8, Q.No. 9 or Q.No. 10.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

Q1) a) What is significant depth? How would you decide the depth of exploration. [5]

- b) A footing 2m square rests on soft clay soil with its base at a depth 1.5m from ground surface. Using skempton's equation determine net safe bearing capacity of footing. for the soil properties $C_u = 80 \text{ kN/m}^2$, $du = 0$, assume $F.s = 3.0$. [5]

OR

Q2) a) What is R.Q.D., How rating of rock quality is decided based on R.Q.D. [5]

- b) Estimate average immediate settlement for the following data : [5]
- i) Footing = $4\text{m} \times 2\text{m}$
 - ii) Depth of foundation = 2 (m)
 - iii) $E = 48,000 \text{ kN/m}^2$, $\mu = 0.5$
 - iv) Contact pressure = 200 kN/m^2 , $\mu_0 = 0.78$, $\mu_1 = 0.84$

Q3) a) Explain terms with sketches [6]

- i) Inside clearance
- ii) Outside clearance
- iii) Area ratio

b) In what situations would you go for combined footing? Explain any one in detail. [4]

OR

P.T.O.

- Q4)** a) Explain the effect of submergence on bearing capacity for different positions of ground water table. [6]
b) In a consolidation test void ratio decreased from 0.7 to 0.65, when the load was changed from 50 kN/m² to 100 kN/m². Compute compression Index and coefficient of volume change. [4]

- Q5)** a) Explain how do you decide bearing capacity of single pile by pile load test method with suitable sketches. [6]
b) Draw a neat sketch of Pneumatic caisson and explain the functions of various component parts. [6]
c) A circular pile section with 0.35m diameter and length 10m penetrates a deposit of clay having $C = 10 \text{ kN/m}^2$ and mobilizing factor $m = 0.8$. Calculate load carrying capacity by skin friction. [5]

OR

- Q6)** a) Explain the classification of piles with basis of classification. [5]
b) What is tilt and shift in case of well foundation. Explain remedial measures for rectification of tilt and shift. [6]
c) A pile 300 mm diameter 8 m deep is installed in a stratum having shearing resistance angle of 30°. A cohesion is 10kN/m². Value of cohesion factor is 0.8 and density of stratum is 17.66 kN/m². Find Ultimate bearing capacity. [6]

- Q7)** a) Explain the effects of swelling and shrinkage of expansive soils on walls and flooring of buildings constructed on it. Also, enlist the precautions to be taken. Illustrate with sketches. [6]
b) Explain any one method of calculating load carrying capacity of double under reamed pile. [6]
c) Draw the neat sketches of structural arrangements involved in [5]
i) Cantilever sheet pile
ii) Anchored sheet pile

OR

- Q8)** a) Explain seven properties of clayey soils which would help in classifying their swelling potential. [6]
b) Explain with sketches [6]
i) Rock fill cofferdam
ii) Sand Bag cofferdam
c) What are the engineering problems associated with black cotton soils. Explain any four in brief. [5]

- Q9) a)** Explain use of geosynthetics in [5]
- i) Roads and pavements
 - ii) Load bearing improvement
- b) Define terms [6]
- i) Epicenter
 - ii) Focus
 - iii) Magnitude and
 - iv) Intensity
- c) Explain any four advantages of geosynthetics over the conventional materials. [5]

OR

- Q10)a)** What is liquefaction. Discuss effects of liquefaction and suggest suitable methods for prevention of liquefaction of soils. [6]
- b) What is reinforced Earth wall. Draw a neat sketch of reinforced earth wall and explain functions of its various component parts. [6]
- c) Differentiate between P-waves and S-waves. [4]

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