

Total No. of Questions : 12]

P749

SEAT No. :

[Total No. of Pages : 4

[4263] - 210
T.E. (Civil)
FOUNDATION ENGINEERING
(2008 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) Answer three questions from Section-I and three questions from Section-II.*
- 2) Answers to the two sections should be written in separate answer books.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Figures to the right indicate full marks.*
- 5) Your answers will be valued as a whole.*
- 6) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 7) Assume suitable data, if necessary.*

SECTION - I

- Q1)* a) How will you plan soil exploration for an important building project. [6]
- b) Explain the terms : Inside clearance, out side clearance, Area ratio [6]
- c) Explain standard penetration test? What are various corrections? [6]

OR

- Q2)* a) Explain with sketches the layout and plot of seismic refraction method. [6]
- b) Write a short note on pressuremeter test. [6]
- c) In a geophysical exploration, the time distance plot gave $V_1 = 300\text{m/s}$ and $V_2 = 900\text{m/s}$ and the break in the plot was located at 35m. Determine the depth of over burden. [6]

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- Q3)** a) Differentiate between Local and General shear failure. [5]
b) State and explain Terzaghis equation of bearing capacity. [5]
c) Write a short note on plate load test. [6]

OR

- Q4)** a) Explain the concept of floating foundation applied to raft. [5]
b) Explain the effect of water-table on value of bearing capacity. [5]
c) Compute safe bearing capacity of a continuous footing 1.8m wide and located at a depth of 1.2m below ground level in a soil having unit weight $\gamma = 20 \text{ kN/m}^3$, $C = 20 \text{ kN/m}^2$ and $\phi = 20^\circ$. Assume factor of safety 2.5. Terzaghis bearing capacity factors for $\phi = 20^\circ$ are, $N_c=17.7$, $N_q=7.4$ and $N_r = 5.0$. [6]

- Q5)** a) What is elastic settlement? Explain, how, it is evaluated. [5]
b) What is the difference between immediate settlement, primary consolidation settlement. [5]
c) In a consolidation test void ratio decreased from 0.70 to 0.65, when the load was changed from 50 kN/m² to 100 kN/m². Compute compression index and coefficient of volume change. [6]

OR

- Q6)** a) Enlist the causes of differential settlement and explain how to minimize it. [5]
b) Define the terms: [6]
i) Compression Intex
ii) Coefficient of volume compressibility
iii) Coefficient of consolidation
c) Explain the method of determining preconsolidation pressure. [5]

SECTION - II

- Q7)** a) State and explain static formula for load bearing capacity of piles in general and explain how would you decide values of various terms involved in the same. [6]
- b) What are the advantages and disadvantages of pneumatic caissons over open caissons? [6]
- c) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of the piles were 30cm and 9m respectively. If the unconfined compression strength of the clay is 90 kN/m², and the pile spacing is 90 cm centre to centre, What is the capacity of the group? Assume a factor of safety of 2.5 and adhesion factor of 0.75. [6]

OR

- Q8)** a) Explain with a sketch the concept of negative skin friction and state how would you determine the same in cohesive and non-cohesive soil. [6]
- b) A pile is driven in a uniform clay of large depth. The clay has an unconfined compression strength of 90 kN/m². The pile is 30 cm diameter and 6 m long. Determine the safe frictional resistance of the pile, assuming a factor of safety of 3. Assume the adhesion factor, $\alpha = 0.7$. [6]
- c) Sketch and describe the various components of well foundation, indicating functions of each component. [6]
- Q9)** a) Draw a neat sketch of double under reamed pile giving details of dimension and state how would you work out its load bearing capacity. [6]
- b) Draw a cross-section of braced excavation indicating component parts. State forces and design principles involved. [6]
- c) With examples, explain the application of sheet pile walls. [4]

OR

- Q10)** a) For anchored sheet pile compare in tabular form [6]
- i) deflection
 - ii) pressure distribution
 - iii) bending moment, patterns for free and fixed earth support condition.
- b) What is a sheet pile wall? Explain cantilever sheet pile wall and anchored sheet pile wall with sketches. [6]
- c) Enlist typical characteristics of Black Cotton soils and give their approximate values. [4]

- Q11)** a) Explain with sketches any three important functions of geosynthetics. [6]
- b) Discuss in detail the types of seismic waves with sketches. [6]
- c) Explain four effects of liquefaction on built environment. [4]

OR

- Q12)** Write detailed notes on any four of following with sketches. [16]
- a) Liquefaction hazard mitigation.
 - b) Factors affecting ground motion.
 - c) Magnitude and intensity of earthquake.
 - d) Geotextile as filter.
 - e) Soil nailing.

