

Total No. of Questions : 12]

SEAT No. :

**P3471**

[Total No. of Pages : 3

**[5560]-108**  
**T.E. (Civil)**  
**FOUNDATION ENGINEERING**  
**(2012 Pattern) (Semester - II) (301009)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10 and Q.11 or Q.12*
- 2) *Neat diagrams must be drawn whenever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary and mention it clearly.*
- 5) *Use of non-programmable calculator is allowed.*

**Q1)** Explain seismic refraction method with respect to **[6]**

- i) Principle
- ii) Procedure
- lii) Limitations.

OR

**Q2)** Explain standard penetration test with a neat sketch. State the correction to be applied to the observed blow count. **[6]**

**Q3)** Write a note on **[7]**

- i) Presumptive bearing capacity
- ii) Effect of eccentricity of load on bearing capacity.

OR

**Q4)** Determine the safe bearing capacity of 1.2 m wide strip footing at a depth of 1.5 m resting on dry sand by Terzaghi's equation. Assume general shear failure. Use following data.  $\gamma = 17\text{kN} / \text{m}^2$ ,  $\phi = 38^\circ$ ,  $N_q = 60$ ,  $N_\gamma = 75$ , factor of safety = 2.5. **[7]**

**P.T.O.**

**Q5)** Explain logarithm of time fitting method for determination of coefficient of consolidation with a neat sketch. [7]

OR

**Q6)** Due to construction of a new structure, the average vertical pressure at the center of 2.5 m thick clay layer increases from 100 kPa to 200 kPa. A laboratory consolidation test was performed on a 20 mm thick clay undisturbed sample of that clay. Under applied stress of 100 kPa & 200 kPa, the void ratio of the sample was found 0.9 and 0.786 respectively, Compute the consolidation settlement of the structure. [7]

- Q7)** a) Explain classification of piles according to function. [5]  
b) Describe the static pile load test with a neat sketch. [6]  
c) Explain different components of a well foundation with a neat sketch. [6]

OR

- Q8)** a) Calculate the ultimate capacity of single pile in clay with following data. Diameter of pile = 200mm, Length of the pile = 8m, Adhesion factor = 0.9,  $N_c = 9$ , Unconfined compressive strength of clay = 100 kN/m<sup>2</sup>. [5]  
b) Write a note on 'Caisson Disease'. [6]  
c) Explain concept of negative skin friction. How it is calculated in single pile and group of piles? [6]

- Q9)** a) What is anchored sheet pile? Explain any four methods of anchoring. [5]  
b) Explain 'pre loading technique' with a neat sketch. [6]  
c) Explain the construction procedure of under-reamed pile with a neat sketch. [6]

OR

- Q10)** a) Explain engineering problems associated with black cotton soil. [5]  
b) Explain 'stone column technique' of ground improvement with a neat sketch. [6]  
c) Write a note on 'cellular cofferdam'. [6]

- Q11)**a) What is earthquake? Explain types of earthquakes with examples. [5]  
b) Write a note on 'liquefaction' of soil [5]  
c) Explain the advantages of geosynthetics over conventional materials.[6]

OR

- Q12)**a) Distinguish between primary waves and secondary waves. [5]  
b) Explain the use of geosynthetics to improve the bearing capacity of soil. [5]  
c) What are the functional requirements of geosynthetics. [6]

