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CAI1328

## Geotechnical Engineering - II (New) (1080)

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** questions from each unit.
5. Figures to the right indicates full marks.
6. Assume suitable data wherever necessary.
7. Non - programmable calculator is allowed.

### UNIT - I

1. a) Explain Rotary drilling. 5  
b) Differentiate between disturbed, Undisturbed and non-representative sample. Also discuss the use to which such sample can be put to respectively. 5
2. a) Write down the Meyerhof's general equation for computing ultimate bearing capacity of soils below footings, clarifying the basis and assumptions made in it. 7  
b) Explain with neat sketches the general shear failure below strip footing having : 3  
i) A smooth base ii) A Rough base.
3. Explain Plate Load Test in detailed. 10

### UNIT - II

4. a) Differentiate between initial settlement and consolidation settlement. 5  
b) Explain contact pressure for rigid and flexible bases with neat sketch. 5
5. Two model tests were made on footing to determine the bearing capacity of a site. The size of footing and the load they took were as follows. 10

SL No	Size of footing in "m"	Load for 1.25 cm settlement in KN
1	0.30 m X 0.30 m	31.5 KN
2	0.60 m X 0.60 m	94.5 KN

Calculate the size of foundation required, square in shape to transmit a load of 1350 KN with 1.25 cm settlement What will be the change in carrying Load for the same footing if allowable settlement is 25.00 mm.

6. a) Explain pressure Bulb. 4
- b) Define : 6
- i) Total settlement.
- ii) Differential settlement.
- iii) Tolerable settlement.

### UNIT - III

7. a) Explain floating foundation. 4
- b) Explain design steps of Trapezoidal combined footing. 6
8. A square footing is required to carry a net load of 1200KN. Determine the size of the footing if the depth of Foundation is 2.0 m and tolerable settlement is 40 mm. The soil is sandy with  $N = 12$ ,  $F.S = 3$ , and the water table is very deep. Use Teng's equations. 10
9. Explain : 10
- i) Grillage foundation.
- ii) Minimum Depth of foundation.

### UNIT - IV

10. Classify the piles depends on their used, materials. 10
11. Find the safe design load on a pile given that the weight of the hammer is 2 T (tonnes) and penetration of pile under the last blow of hammer is 3.5 mm. The height of the drop hammer is 2.5 cm. Used Engineering News formula. 10
12. Write down characteristics of B.C. soil and required precautions for construction in block cotton (B.C) soil in details. 10

### UNIT - V

13. a) Write down : 10
- i) Pneumatic cassion.
- ii) Sand Island method.
14. Briefly discuss the techniques of well sinking in relation to the well foundations with neat sketches. 10
15. a) Discuss the use of single degree freedom system in the analysis of machine foundations ? What are its limitations. 6
- b) Resonance occurs at a frequency of 20CPS in a vertical vibration of a test block (1m x 1m x 1m) Calculate the coefficient of Elastic Uniform compression ( $C_u$ ). The Weight of the oscillator was 500 N. 4

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