

**TE/Insem/APR-103**  
**T.E. (Civil)**  
**FOUNDATION ENGINEERING**  
**(2015 Pattern)**

**Time : 1 Hour]**

**[Max. Marks : 30**

**Instructions to the candidates :**

- 1) *Answer Q. 1 or Q. 2, Q.3 or Q. 4 and Q. 5 or Q. 6.*
- 2) *Answer to the two sections should be written in separate books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 5) *Assume suitable data if necessary.*
- 6) *Neat diagrams must be drawn wherever necessary.*

**Q1) a)** Explain N value correction and significance. **[5]**

b) Explain with sketch Electrical Resistivity Method. **[5]**

OR

**Q2) a)** Describe various types of soil samplers. **[5]**

b) The inner diameter of sampling tube and that of cutting edge are 64 mm and 62 mm respectively. Their outer diameters are 68 mm and 70 mm respectively. Determine (i) inside clearance (ii) outside clearance (iii) area ratio of the sampler. Comment on type of sample. **[5]**

**Q3) a)** Define and explain various modes of shear failures. **[5]**

b) A 30 cm square bearing plate settles by 8mm in the plate load test on cohesion less soil, when the intensity of loading is  $180 \text{ kN/m}^2$ . Estimate the settlement of shallow foundation of 1.6 m square under the same intensity of loading. **[5]**

OR

**P.T.O.**

- Q4)** a) State & explain Skempton's equation of bearing capacity. [5]  
b) Explain with neat sketch floating foundation. [5]
- Q5)** a) What is pressure bulb and how it is used to avoid settlement. [4]  
b) Determine immediate settlement at the center of foundation. Use following data, footing size -  $20\text{m} \times 30\text{m}$ , uniform pressure =  $150\text{kN/m}^2$ ,  $E = 40000\text{kN/m}^2$ , Poisson's ratio = 0.5,  $I_F = 1.2$ . [6]

OR

- Q6)** a) Explain the spring Analogy model given by Terzaghi. [4]  
b) A consolidation test on a sample of clay having thickness of 3.2 cm indicates half of consolidation in first 6 minutes, under similar conditions how long the strata of 5m thick will take time for half consolidation with single drainage. [6]

