**AKGEC/IAP/FM/02**

**AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZIABAD**

**DEPARTMENT OF CIVIL ENGINEERING**

**SESSIONAL TEST -2**

Course: B.Tech Semester: V

Session: 2017-18 Section: CE-1 & CE-2

Subject: Geotechnical Engineering Sub. Code:NCE-501 Max Marks:50 Time: 2 hour

Answer **all** the Sections.

**SECTION A**

1. Attempt **all** parts. (**5×2= 10)**
2. Explain quick sand condition in soil.
3. What is the process of consolidation of soil? Distinguish between consolidation and compaction process.
4. Explain in brief about stress isobar.
5. Explain Compression Index and Recompression Index of soil.
6. Define coefficient of permeability

**SECTION B**

1. Attempt**all** parts. (**5×5= 25)**
2. Derive the desired relationship of a falling head permeability test.
3. A Rectangular footing 6m x 3m in size transmits a pressure of 16KN/m2 to the soil. Calculate the increases of vertical stress at a point 0.5m below the centre of the foundation. Use Boussinesq equation.
4. A saturated soil stratum 6m thick lies above an impervious stratum and a pervious stratum. It has a compression index of 0.28 and coefficient of permeability of **3.5x10-4** cm/sec. Its void ratio at a stress of **150KN/m2**is 1.95. Compute:

**(i)** the change in void ratio due to an increase in stress to **210KN/m2**

**(ii)** settlement of soil stratum due to the above increase in stress and

**(iii)** time required for 50% consolidation

Assume time factor for 50% consolidation as 0.20

1. Derive the Laplace’s Equation of continuity with al assumptions.
2. What is piping in hydraulic structure? Suggest some remedial measure to check or prevent it.

**SECTION C**

1. Attempt**all** parts. (**2×7.5= 15)**
2. Granular soil deposit is 7 m deep over an impermeable layer. The ground water table is 4m below the ground surface. The deposit has a zone of capillary rise of 1.2m with a saturation of 50%. Plot the variation of total stress, pore water pressure and effective stress with the depth of deposit, e = 0.6 and Gs = 2.65.
3. Write short note on:

i. Field compaction control

ii. Field compaction methods