24290

B.Tech. 5th Sem. (Civil Engg.) XI
Examination December, 2013

SOIL MECHANICS

'F' Scheme

Paper : CE-307-F

Time : Three hours]   *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note :   Attempt any *eight* part of Q. 1.

1. (a) What is soil formation and composition ?

    (b) Define sieve analysis.

    (c) Explain plasticity chart.

    (d) What is Darcy's law ?

    (e) Define properties and utilities of flow net.

    (f) Define Boussinesq's equation.

    (g) Explain Newmark's influence chart.

    (h) What is secondary consolidation ?

(i) Explain Vane Shear test.

(j) Define Rankine's earth pressure theory. $2.5 \times 8 = 20$

PART – A

2. (a) Explain major soil deposits of India.   10

(b) Explain grain size distribution curves in details. 10

3. For a field pumping test, a well was sunk through a horizontal stratum of sand 14.5 m. thick and underlain by a clay straitum. Two observation wells were sunk at horizontal distances of 16 m. and 34 m. respectively. from the pumping well. The initial position of water table was 2.2 m. below ground level. At a steady pumping rate of 1 m³/min., the drawdowns in the observation wells were found to be 2.45 m and 1.2 m respectively. Calculate the co-efficient of permeability of the sand. Derive the equation used, if any.   20

PART – B

4. Explain the properties and utilities of flow nets. Define the graphical method for construction of flow nets. 20

5. Find the ratio between compactive energy used in standard proctor compaction test and that in modified proctor compaction test.   20

PART – C

6. What is Newmarks influence chart ? Explain approximate stress distribution methods for loaded areas.   20

7. A fully saturated sample of 130 gm. and has a volume of 64 cc. The sample mass is 105 gm. After oven drying. Assuming the volume does not change during drying ? Determine the following :

   (i)   Specific gravity

   (ii) Void ratio

   (iii) Porosity

   (iv) Dry density   20

PART – D

8. (a) Explain the direct shear test. State the advantages and limitations of this test.   10

   (b) Define the Mohr-Coulomb failure criterian with neat sketch.   10

9. (a) Define Rankine's earth pressure theory in detail.   10

   (b) State and explain culamann's graphical construction with neat sketch.   10