

Th2 Geotechnical Engineering

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What is density index?
 - b. State stokes law.
 - c. What is active earth pressure?
 - d. Define air content and percentage air voids?
 - e. What do you mean by dispersing agent correction?
 - f. What do you mean by flow index?
 - g. Write the name of tests for finding shear strength of soil?
 - h. Differentiate between compaction and consolidation?
 - i. What do you mean by ultimate bearing capacity?
 - j. What do you mean by correction due to dilatancy and overburden?
2. Answer **Any Six** Questions 6 x 5
 - a. What is scope of soil mechanics?
 - b. Explain the phenomenon of quick sand.
 - c. Describe gravity loading method of plate load test ?
 - d. A constant head permeability test was conducted on a soil specimen has specific gravity of 2.65 and saturated water content of 20% . If the coefficient of permeability is 0.1 m/sec the seepage velocity is .
 - e. Explain about standard penetration test.
 - f. What are the factors affecting compaction?
 - g. Explain pycnometer method for determination of water content.
3. Write about IS classification of soil. 10
4. For a soil sample the specific gravity of soil mass is 1.7 and specific gravity of soil particle is 2.65 determine its void ratio 10
 - a) Assuming sample is dry
 - b) Sample has water content of 15%
5. A rectangular footing 2mx3m rests on c- Φ soil with its base at 1.5m below ground surface. Calculate safe bearing capacity , using factor of safety as 3 on 10
 - 1) net ultimate bearing capacity
 - 2) ultimate bearing capacity

The soil has bulk unit weight =18kn/m³, C=10 kn/m³, $\Phi=30^\circ$ use Terzaghi analysis.
6. A clay layer 4m thick is sand witched between layer of sand calculate the time the clay layer take to reach 70% consolidation. Coefficient of consolidation =3x10⁻⁴ 10
7. Describe briefly procedure of sedimentation analysis and hydrometer method . 10