3RD SEM./ CIVIL/ 2022(W)

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   10
         soil particle is 2.65 determine its void ratio
         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   10
         ground surface. Calculate safe bearing capacity , using factor of safety as 3 on
         1) net ultimate bearing capacity
         2) ultimate bearing capacity
         The soil has bulk unit weight =18kn/m^3,C=10 kn/m^3,Φ=30° use Terzaghi
         analysis.
6   A clay layer 4m thick is sand witched between layer of sand calculate the time   10
         the clay layer take to reach 70% consolidation. Coefficient of consolidation
         =3x10^{-4}
7   Describe briefly procedure of sedimentation analysis and hydrometer method .   10