National Institute of Technology Hamirpur
Civil Engineering Department
5th Semester Examination

CED – 313 (Geotechnical Engineering - II) Foundation Engineering

Time: 3 Hours   **Maximum Marks : 50**

Note: Attempt all questions.

Q 1.   Explain Swedish circle method for determining the stability of a finite slope in $c - \phi$ soil. How will you locate the centre of the critical slip circle?

(10)

Q 2.   Illustrate Terzaghi's analysis for determining safe bearing capacity of a shallow footing giving the assumptions and limitations.

(10)

Q 3.   Discuss the dynamic formulae for determining the load carrying capacity of a pile. Also give the limitations of the dynamic formulae.

(10)

Q 4.   Illustrate various steps of designing a gravity retaining wall. Give the criteria to be satisfied in the design.

(10)

Q 5. (a) An anchored bulkhead is to be designed to retain a granular backfill of 9 m height above dredge line. Anchor rod is provided at a depth of 1 m below top of fill. Assuming the water table to be 2 m below top of the fill and soil of fill as that below the dredge line having the same properties ($c = 0$, $\phi = 33°$, $\gamma = 17 \text{ kN/m}^3$ and $\gamma_{sat} = 20 \text{ kN/m}^3$); compute the depth of embedment and tensile force in anchor rod of bulkhead. Use free earth support method and increase computed embedment depth by 40%.

(b) Discuss how will you determine the bearing capacity of a well foundation as per Terzaghi's criteria.

(7, 3)