[Total No. of Questions - 9] [Total No. of Printed Pages - 4]
(2123)

1382

B. Tech 5th Semester Examination

Geotechnical Engineering (O.S.)

CE-5005

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : (i) Attempt five questions in all, selecting one question from each of the sections A, B, C D and all the subparts of the question in section E.

(ii) Assume any missing data suitably.

(iii) Use of non-programmable calculators is allowed.

SECTION - A

1. What are rocks? How are they formed? Explain identification of each group of rocks with examples. **(20)**

2. Discuss common type of faults with their distinguishing features. What is the affect of faulting in relation to various engineering works? **(20)**

SECTION - B

3. Discuss the following:

   (i) Sheeting and bracing of deep open cuts.

   (ii) Pressure distribution behind sheeting in a braced cut.

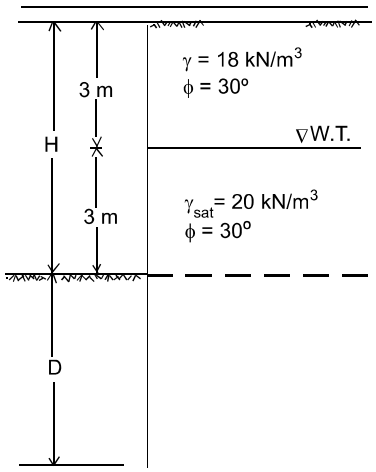
   (iii) Stability of bottom of an excavation in soft clays (ϕ_{ii}=0).

   (20)

4. Draw sketches to explain various types of cofferdams. Also discuss the design data for a cellular cofferdam. **(20)**

SECTION - C

5. For the cantilever sheet pile wall shown in figure below, compute the depth of embedment of sheet pile by rigorous method. **(20)**



6. Describe free earth support method for analyzing flexible anchored sheet pile bulkheads in cohesionless soils. **20**

SECTION - D

7. Describe the following methods of soil stabilization, discussing the type of soil for which they are useful:

   (i) Bituminous stabilization.

   (ii) use of stone columns.

   (iii) dynamic compaction and consolidation.

   (iv) lime flyash stabilization. **(20)**

8. (a) Bring out the equation of motion for undamped free vibrations of mass-spring system. What is the natural frequency of the system? **(10)**

(b) Calculate spring constant of an elastic plate of area 'A' and thickness 't'. **(4)**

(c) Determine natural frequency of a machine foundation of plan size 2m × 2m with a weight of 150kN including the machine if the coefficient of elastic compression is 4.5 x 10^4kN/m^3. **(6)**

SECTION - E

9. (a) Densification of cohesionless soils can be effectively done by.....roller. **(1)**

(b) Reinforced earth is a construction material consisting of soil that has been strengthened by the inclusion of..... **(1)**

(c) For braced cut of height H, in sand, the active pressure (p_a) to be considered for the entire height is..... **(1)**

(d) In a bracing system, struts generally fail under..... **(1)**

(e) Sheet pile walls depend for their support on the..... **(1)**

(f) Anchored sheet pile walls are used when the height of backfill exceeds..... **(1)**

(g) The simplest form of periodic motion is..... **(1)**

(h) What do you mean by degree of freedom of a vibratory system? **(2)**

(i) What is meant by the cleavage of a mineral? **(2)**

(j) Distinguish between throw and heave. **(2)**

(k) Differentiate between free earth support and fixed earth support method of analyzing sheet piles. **(3)**

(l) What do you mean by soldier beams? **(2)**

(m) Give two criteria for satisfactory action of a machine foundation. **(2)**