RDR/2KNT/OT – 10397

B. E. Sixth Semester (Civil Engineering) / SoE – 2014-15 Examination

Course Code : CV 1333/CV 404/CV 603 **Course Name : Geotechnical Engineering - II**

Time : 3 Hours] [Max. Marks : 60

Instructions to Candidates :—

(1) All questions are compulsory.
(2) All questions carry marks as indicated.
(3) Due credit will be given to neatness and adequate dimensions.
(4) Assume suitable data wherever necessary.
(5) Diagrams should be given wherever necessary.
(6) Illustrate your answers wherever necessary with the help of neat sketches.
(7) Use of non programmable calculator, Drawing instruments is permitted.

1. Solve any **One** of the following :

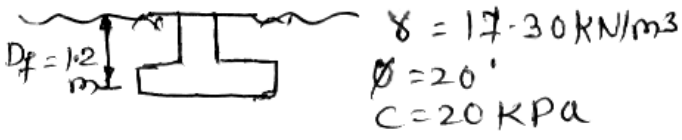
(A) What are the different types of boring methods ? Explain one of them in brief. 7

(B) Enlist different geophysical methods and explain seismic Refraction method With its limitations. 7

2. Solve any **One** of the following :-

(A) Write the assumption of Terzaghi's bearing Capacity Theory. Compute the allowable bearing pressure using the Terzaghi equation for the footing and soil parameters shown in Fig. Use a safety factor of 3.2 to obtain q**a**. Assume general shear failure N**C** = 18.7, N**q** = 7.4, N = 5.0 8

(B) A Square footing located at a depth of 1.5 m below the ground surface has to carry a safe load of 800 KN. Find the size of the a factor of safety of 3.2. The soil is following properties e = 0.65, G = 2.68, Sr = 60%, C = 19 KN/m^2, N**c** = 37.2, N**q** = 22.5, N = 19.7 and f = 3.



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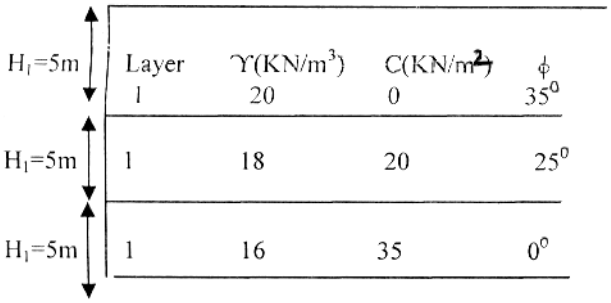
3. Solve any **One** of the following :-

(A) A reinforced concrete pile weighing 30 kN is driven by a drop hammer weighing 40 k N and having an effective fall of 0.8 m. The average set per blow is 1.4 cm. The total temporary elastic compression is 1.8 cm. Assuming the co-effcient of restitution as 0.25 and a factor of safety of 2, determine the ultimate bearing capacity and the allowable load for the pile. 7

(B) A 25-pile square group has to be proportioned in a uniform pattern in clay with equal spacing in all directions. Taking c-0.7, determine the optimum value of spacing, Neglect end bearing effect of the group. Each pile is square in cross section, with sides of length a. 7

4. Solve any **One** of the following :

(A) A rataining wall of height 15m retains a 3 layered backfill as shown in fig. with smooth vertical back Draw active pressure distribution.



Layer	Υ(KN/m^3)	C(KN/m^2)	ϕ
1	20	0	35^0
1	18	20	25^0
1	16	35	0^0

8

(B) A 6m high vertical wall supports a saturated, cohesive backfill ($\phi_u = 0$) with horizontal surface. The top 3 m of the backfills weighs 18 KN/m^3 and has an apparent cohesion of 18 KN/m^2. The bulk unit weight and apparent cohesion of the bottom 3 m of the backfill are respectively 20 KN/m^3 and 24 KN/m^2. What is the likely depth of tension cracks behind the wall ? If tension cracks develop, what will be the total active pressure ? Draw the pressure distribution diagram and determine the point of application of the resultant pressure. 8

5. Solve any **Three** of the following :-

(A) What are the types and causes of slope failure ? 5

(B) An embankment is to be made of sandy clay having C = 30 KN/m^2, angle of internal friction is 25 ^{0} unit weight of soil = 17 KN/m^3. The slope and height of embankment are 16:1 and 10 m respectively. Determine FOS by using trial circle by method of slice. 5

(C) Explain in detail the Swedish slip circle method. 5

(D) Give the stability analysis of infinite slope for cohesive soil. 5

6. Solve any **Three** of the following :-

(A) Explain geofoam and its application in Civil Engineering with neat sketch. 5

(B) Write short notes on :-

(i) Mechanical Stabilisation.

(ii) Chemical Stabilisation. 5

(C) Explain sand drain their uese. 5

(D) Explain pre loading and surcharging. 5