(b) Explain Mohr-Coulomb failure criterion for failure plane.

9. Explain Culmann's graphical construction method for earth pressure determination. Compare it with   20
Rebhann's construction method.

Roll No. ....

24290

B. Tech. 5th Semester (Civil Engg.) Examination—December, 2016

SOIL MECHANICS

Paper : CE-307-F

Time : Three Hours]   [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory.* All question carry equal marks.

1. Differentiate between :   5 × 4 = 20

   (a) Bulk density and dry density

   (b) Active earth pressure and passive earth pressure.

   (c) Normally consolidated and over consolidated soil.

(d) Standard proctor and modified proctor compaction test.

(e) Compaction and Consolidation.

SECTION – A

2. (a) Explain gain size distribution curve in detail. 10

(b) A clay sample originally 27 mm thick and at a void ratio of 1.120, was subjected to a compressive load. After the sample was completely consolidated, its thickness was measured to be 24 mm. Find the final void ratio. 10

3. (a) Define a comment on the validity of Darcy's Law for soils. 10

(b) List and explain the factors that influence permeability of soils. 10

SECTION – B

4. (a) What do you mean by flow nets ? Explain the graphical method for construction of flow nets. 10

(b) What are the assumptions made in Laplace equation ? Derive expression also. 10

5. What do you mean by compaction curve ? Show and explain zero-air void line. 20

SECTION – C

6. What is the basis of the construction of Newmark's influence chart ? How is it used ? 20

7. (a) What do you mean by preconsolidation pressure ? Explain the method used to obtained it graphically. 10

(b) The laboratory consolidation data for an undisturbed clay sample are $e_1 = 1.00$ $\bar{\sigma}_1 = 85$ kN/m² and $e_2 = 0.80$. $\bar{\sigma}_2 = 465$ kN/m². Find the void ratio for a pressure of $\bar{\sigma}_3 = 600$ kN/m². 10

SECTION – D

8. (a) What is the significance of the pole pressure coefficients ? Write an example also. 10