Total No. of printed pages = 4

CT-503/Geotech. Engg./5th Sem/2014/N

GEOTECHNICAL ENGINEERING

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No.1 and any *four* from the rest.

1. Fill in the blamks :

   (i) ———— soil are extremely compressible and their use as foundation material is best avoided. 1

   (ii) Soil produced by chemical weathering of rocks are ———— soil. 1

   (iii) The numerical results obtained on the basis of classification tests are termed as ———. 1

   (iv) Soil grain properties depends on ———— of soil and independent of the ———. 2

   (v) In cohesionless soil ——— forces determines the engineering characteristic whereas ——— forces are predominant in the case of fine grained soil. 2

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(vi) In the construction of engineering structures loose fills are required to be compacted to increase ——— and improve their ——— . 2

(vii) ——— soil is the accumulation of rock debris at the base of a stiff cliff. 1

2. (i) What do you understand by residual and transported soil ? Classify transported soil according to the transporting agency and method of deposition. 7

(ii) A soil sample in its undisturbed state was found to have volume of 105 cm^3 and mass of 201g. After oven drying the mass got reduced to 168g. Compute the following if specific gravity is 2.7.

(i) water content

(ii) dry density

(iii) void ratio

(iv) porosity

(v) volume of voids. 8

3. (i) How will you determine whether the given soil is of organic origin or coarse grained or fine grained ? Classify soil according to ISSCS. 6

(ii) Distinguish between :

(a) Normally consolidated, over-consolidated and under-consolidated soil.

(b) Well graded, poorly graded and gap graded soil.

(c) Virgis compression, expansion and recompression curve. 9

4. The following properties were determined for two soils A and B. 15

	A	B
Water content	37%	25%
Liquid limit	61%	35%
Plastic limit	25%	20%
Specific gravity	2.72	2.68
Degree of saturation	100%	100%

Which of these soil

(i) contains more clay particles

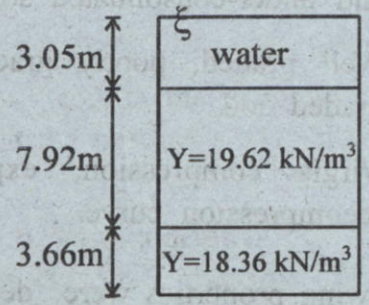
(ii) has a greater saturation unit weight

(iii) has a greater dry unit weight

(iv) has a greater void ratio ?

Your answer should be supported by computation.

5. Draw and calculate effective stress, total stress and pore pressure diagram of the given soil mass. 15



6. A soil having G = 2.75 is subjected to Proctor compaction test in a mould of V = 945 cm^3. The observations recorded are as follows :

Mass of wet sample (g)	w(%)
1389	7.5
1767	12.1
1824	17.5
1784	21.0
1701	25.1

Determine

(i) Maximum dry unit weight and optimum moisture content.

(ii) Draw 100% saturation line. 15