Total No. of printed pages = 3

CT-503/Geo. Engg./5th Sem/2013/M

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. Define : 10

(i) Uniformly graded soil

(ii) Void ratio

(iii) Porosity

(iv) Bulk unit weight

(v) Adsorbed water

(vi) Darcy's law

(vii) Cohesion

(viii) Coefficient of consolidation

(ix) Permeability

(x) Compaction.

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2. (a) Define soil mass as a two-phase system and soil mass as a three-phase system. 5

(b) A partially saturated sample from a borrow pit has a natural moisture content of 15% and bulk unit weight of 1·9 g/cc. The specific gravity of solids is 2·7. Determine the degree of saturation and void ratio. What will be the unit weight of the sample on saturation ? 10

3. (a) How kaolinite structure is different from montmorillonite structure ? 5

(b) A 1000 cc core cutter weighs 946·8g was used to find out the in situ unit weight of an embankment. The weight of core cutter filled with soil was noted to be 2770·6g. Laboratory tests on the sample indicates a water content of 10·45% and G = 2·65. Determine bulk unit weight, dry unit weight, void ratio and degree of saturation of the sample. 10

4. (a) What is the basic differences between 9

(i) Compaction and consolidation

(ii) Well graded soil and gap graded soil

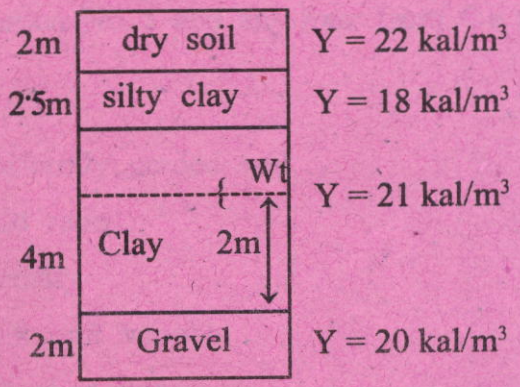
(iii) Residual soil and transported soil ?

(b) Derive a relationship between Y, G, e, w and Y_w. 6

5. (a) Describe the structural difference between formulated and dispersed structure in clay deposit. 5

(b) Describe the virgin compression curve, expansion curve and recompression curve of one-dimentional consolidation. 10

6. Draw the effective stress, total stress and pore pressure diagram for the given soil mass.



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