17450

21314

2 Hours / 50 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory*.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any <u>SEVEN</u> of the following : **14**

a) Define soil Mechanics. Write its field applications. (any two)

b) Enlist major soil groups of India.

c) State the importance of soil in Civil Engg as construction material and as foundation material.

d) Define wilting point and ultimate wilting percentage.

e) Name various methods of determining moisture content of soil.

f) Derive relation between porosity and void ratio.

g) State grain size classification of soil.

h) Describe the term - coefficient of permeability.

i) Draw a typical compaction curve and name the components.

j) State the reasons for conducting CBR test.

Marks

2. Attempt any FOUR of the following : **12**

a) Explain the processes of formation of soil briefly.

b) Define soil structure. State the factors affecting it.

c) Write step-wise procedure to find specific gravity of soil.

d) Describe the terms -

i) Field capacity

ii) Drainable porosity

iii) Maximum retentive capacity

e) Define Alterberg's limits of consistency.

f) A soil has a liquid limit of 62 and a plastic limit of 30. The results of moisture content test on an undisturbed sample were as follows -

Mass of container - 20.8 gm

Mass of soil + container before placing in oven = 96.2 gm

Mass of soil + container after removed from oven = 71.9 gm

Compute -

i) The plasticity index

ii) The moisture content.

Marks

3. Attempt any FOUR of the following : **12**

a) Find the degree of saturation of a soil having G_s = 2.7, n = 42.1 % and w = 20.4 %.

b) Write classification of soil on the basis of plasticity.

c) From grain-size curve following data was obtained D_{10} = 0.20 mm, D_{30} = 1.0 mm, D_{60} = 1.8 mm. Find coefficient of uniformity and coefficient of curvature.

d) State the characteristics of flownet.

e) Describe the phenomenon of quick sand.

f) A soil sample 150 mm long and 100 mm in diameter is placed in a permeameter that is connected to a vertical pipe of 2 mm diameter. The level of water in this pipe, measured above the outlet level in the permeameter drops from 1100 mm to 800 mm in 50 seconds. What is the permeability of the soil ?

4. Attempt any FOUR of the following : **12**

a) State Darcy's law. Also state values of permeability for different soil types.

b) Explain capillary phenomenon in soil and its importance.

c) Write applications of flownets.

d) Describe standard proctor test.

e) Name field methods of compaction and state suitability of each.

f) Make comparison between lime stabilization and cement stabilization.

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