17450

21415

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

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

(2) Answer each next main Question on a new page.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

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

Marks

1. Attempt any SEVEN of the following: **14**

a) Define porosity and void ratio.

b) Define shrinkage limit and plasticity index.

c) Define relation between porosity and void ratio.

d) Define coefficient of curvature and coefficient of uniformity.

e) Differentiate between phreatic line and equipotential line.

f) State Darcy's law of permeability.

g) What is seepage pressure and seepage velocity?

h) Define: compaction and consolidation.

i) Enlist various methods of soil stabilization.

j) List out the equipments used for compaction of soil.

Marks

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

a) State any six importance of soil in civil engineering structure.

b) Explain soil as a three phase system with labeled sketch.

c) A soil saturated sample has porosity of 40%. The specific gravity of solid is 2.70. Calculate:

(i) Void Ratio

(ii) Dry Density

(iii) Unit Weight.

d) Explain the procedure for determination of constant head test for finding out coefficient of permeability of soil.

e) State the characteristics of flow net.

f) State and explain any three factors which affects the compaction of soil.

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

a) Explain how soil acts as a medium of plant growth.

b) Derive the relation between void ratio, water content, degree of saturation and specific gravity.

c) How do you determine water content of soil? Explain.

d) Given, $D_{10} = 150\,\mu$, $D_{30} = 4.75$ mm, $D_{60} = 20$ mm. Find the coefficient of curvature for soil partide.

e) Explain shrinkage and swelling in soils.

f) What is CBR value? Draw CBR test set-up and name the parts.

Marks

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

a) Enlist the field application of soil and explain any one.

b) How liquid limit for soil is determined in laboratory? Explain

c) Draw phase diagram for dry soil and fully saturated soil.

d) Explain how the soil is classified on the basis of plasticity.

e) What is quick sand condition? Give the formula related to it.

f) Explain capillary phenomenon in soils.

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