

# 17450

**15162**

**2 Hours / 50 Marks**

Seat No.

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- 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) Use of Non-programmable Electronic Pocket Calculator is permissible.  
(5) Abbreviations used convey usual meaning.

**Marks**

- 1. Attempt any SEVEN of the following:** **14**
- Enlist uses of soil as a construction material.
  - Draw phase diagrams for dry and saturated soil.
  - Define bulk density and specific gravity.
  - What is degree of saturation? Write its relation with void ratio, water content and specific gravity.
  - Explain briefly the need for soil classification.
  - Define:
    - Permeability and
    - Coefficient of permeability
  - Why soils shrink and swell? Explain.
  - Distinguish between standard and modified proctor test.  
(any two points)
  - State field situations, where compaction is needed.
  - Write use of CBR.

P.T.O.

- 2. Attempt any FOUR of the following:** **12**
- a) Describe soil as a medium of plant growth.
  - b) Define soil mechanics. Enlist its field applications.
  - c) State factors affecting soil structure.
  - d) A fully saturated soil sample has volume of 25 cc and mass 35 gm. After drying in oven at 110°C for 24 hrs. Its mass reduced to 25 gm. Find water content and void ratio.
  - e) (i) Define water content, of soil. State its importance. 2  
(ii) Enlist the methods to determine it. 1
  - f) Describe core cutter method to find dry density of soil.
- 3. Attempt any FOUR of the following:** **12**
- a) Define Atterberg's limits of consistency of soil.
  - b) Describe as to how liquid limit is determined in laboratory.
  - c) Write symbols and graphical representation of soils.
  - d) Explain mechanical sieve analysis.
  - e) What is soil filth? Explain its importance.
  - f) Define:
    - (i) phreatic line
    - (ii) flow line
    - (iii) equipotential line
- 4. Attempt any FOUR of the following:** **12**
- a) Explain the factors that affect permeability.
  - b) Describe falling head permeability test.
  - c) Through a soil sample of c/s area 50 cm<sup>2</sup> and length 10 cm, water collected in 10 minutes is 450 cc. Under a constant head of 80 cm. Determine the coefficient of permeability.
  - d) Draw a flow net representing seepage through earth dam. Write one application of flow net.
  - e) Name field methods of compaction. Explain any one.
  - f) Elaborate on the factors that affect compaction.
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