16117

3 Hours / 100 Marks   Seat No.

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

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

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

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

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

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

Marks

1. **Attempt any FIVE of the following**   **20**

a) State the advantages of sub surface drainage.

b) Explain the types of land requiring drainage.

c) Discuss the land smoothing for surface drainage.

d) What is surface drainage?

e) A drainage canal discharges 0.2 cubic meter of water per sec. and drains 250 hectares. What is the drainage coefficient?

f) Define drainage. State type of drainage methods.

g) Discuss chemical properties of soil.

Marks

2. **Attempt any TWO of the following:** **16**

  a) Describe the benefit of drainage.

  b) Define water logging and describe effects of water logging.

  c) Explain the salt affected soil classification.

3. **Attempt any TWO of the following:** **16**

  a) Write short notes on:

  (i) Drainage porosity

  (ii) Hydraulic conductivity

  b) How will you install piezometer? Explain the observation will.

  c) How will you estimate the drainage requirements?

4. **Attempt any TWO of the following:** **16**

  a) Design a drainage canal to drain 550 hectares of land having a drainage coefficient of 2.5 cm. day. The soil is silt loam maximum permissible slope of channel bed is 0.1 percent.

  b) (i) What is drainage coefficient?

  (ii) Discuss the types of sub surface drainage.

  c) What is drainage criteria for steady and unsteady flow?

5. **Attempt any TWO of the following:** **16**

  a) Explain the different layouts of sub surface drainage systems with neat sketches.

  b) Explain drainage depths for different crops.

  c) Write assumptions and derive Hooghoudt's equation.

6. **Attempt any TWO of the following:** **16**

  a) Explain the hydraulic design of sub surface drainage system.

  b) Explain the importance of salt balance.

  c) What is mole drainage and how will you install it? Explain with figure.

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