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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.

Marks

1. Solve any FIVE : **20**

(a) Define drainage and state type of drainage methods.

(b) Discuss chemical properties of soil.

(c) Explain types of land requiring drainage.

(d) State advantages and disadvantages of subsurface drainage.

(e) Explain surface drainage.

(f) Discuss land smoothening of surface drainage.

(g) A drainage canal discharges 0.2 m^3 of water per sec. and drains 250 Ha. What is drainage coefficient of this land ?

2. Solve any TWO : **16**

(a) Describe water logging, its effects and control.

(b) Discuss drainage potential, problem and status in India.

(c) Explain leaching, definition, causes and control.

3. Solve any TWO : **16**

(a) Explain basic information required for investigating drainage problem.

(b) Explain how will you estimate drainage requirement.

(c) Describe drainage criteria for steady and unsteady state.

4. Solve any TWO : **16**

(a) Explain following drainage properties :

(i) Structure

(ii) Texture

(iii) Drainage porosity

(iv) Hyd conductivity

(b) Design a drainage canal to drain 550 Ha of land having drainage coefficient of 2.5 cm. The soil is silt loam. Max. permissible slope of channel bed is 0.5%.

(c) (i) State economic aspects of surface drainage system.

(ii) State properties and subsurface drainage materials.

5. Solve any TWO : **16**

(a) Explain steps in hydraulic design of subsurface drainage system.

(b) Write assumptions made in Houghoudt's equations and derive equation for spacing of drainage.

(c) Determine the size of the tile required at the end of a 500 m long tile line, if drainage coefficient is 1 cm. Grade is 0.3% and tile spacing is 50 m.

6. Solve any TWO : **16**

(a) What is mole drainage ? How will you install it ? Explain with sketch.

(b) Explain components and layouts of subsurface drainage system.

(c) Explain in brief installation steps for subsurface drainage.
