# 17578

**14115**

**3 Hours / 100 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>TEN</u> of the following:** **20**

a) Name major soils of India. State their location.

b) Write constituents of soil and their importance.

c) Enlist physical properties of soil that are important with respect to plant growth.

d) Define:

(i) Consistency and

(ii) Porosity of soil

e) Explain the term Hygroscopic coefficient.

f) Write the importance of soil aeration.

g) What is the basic strategy to reduce soil erosion?

**Marks**

h) What is meant by contour bunding?

i) Explain in brief the process of saltation.

j) Write classification of gullies.

k) Enlist permanent soil conservation structures.

l) What is ground water recharge? State the techniques used for the same.

m) State the importance of spillways in earth dam.

n) Explain in brief piping with reference to earth dams.

**2. Attempt any <u>FOUR</u> of the following:** **16**

a) Why loams are best suited for agriculture?

b) What makes lateritic soils unsuitable for agriculture?

c) In what way the structure of soil affects its suitability for agriculture?

d) Define texture of soil. Explain its importance.

e) Define void ratio. Explain how it is related to plant growth.

f) Write a short note on soil separate stating their physical nature and classification.

**3. Attempt any <u>FOUR</u> of the following:** **16**

a) Write the importance of moisture content of soil in plant life.

b) Name the methods used to determine soil moisture. Explain one.

c) Discuss the meaning and importance of:

(i) Field capacity and

(ii) Permanent wilting point

d) Define permeability of soil and write its agricultural applications.

e) State and explain Darcy's law. Define coefficient of permeability.

f) Explain:

(i) SAR

(ii) ESP

**Marks**

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

a) Write the significance of soil pH.

b) What is meant by soil erodibility? Briefly explain the factors affecting it.

c) Discuss topography as a factor influencing erosion by water.

d) Distinguish between "Gully erosion" and "Rill erosion".

e) Classify gullies. Briefly explain each type.

f) Explain any two factors influencing erosion by wind.

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

a) Name the temporary structures used for control of gully erosion. State adaptability of each.

b) Write a short note on vegetated water ways as a erosion control measure.

c) Name the types of terraces. Sketch and explain any one.

d) Briefly explain design of bund.

e) Explain the technique of 'Strip Cropping'.

f) Illustrate the constructional features and adaptability criteria for Drop inlet spillway (shaft spillway)

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

a) Draw a neat sketch of chute spillway and state the purpose of the same.

b) Prepare a brief an design of farm pond.

c) Explain the use of earthen embankments as a soil and water conservation structure.

d) Write a note on soil conservation through tree and grass cultivation.

e) Sketch a neat cross section of earthen dam.

f) Summarize the causes of failure of earth dam.