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B.Tech Even Semester (CBCS) Exam., May—2019

AGRICULTURAL ENGINEERING

( 4th Semester )

Course No. : AECC-11

( Soil Science )

Full Marks : 50

Pass Marks : 15

Time : 2 hours

Note : 1. Attempt any **five** questions.

2. Begin each answer in a new page.

3. Answer parts of a question at a place.

4. Assume reasonable data, wherever required.

5. The figures in the margin indicate full marks for the questions.

1. (a) What is soil colloid? Explain the swelling and shrinkage property of colloidal clay particles. 1+2=3

(b) Discuss the different structures of clay silicate layers. 7

2. (a) Compare the different properties of silicate clay minerals. 5

(b) Briefly explain the sources of negative charges on silicate clays. 5

3. (a) Define soil aeration. Give the composition of soil air. 2+3=5

(b) Discuss the role of soil temperature on fertility of soil and plant growth. 5

4. (a) Discuss the various factors influencing the composition of soil air. 5

(b) What are the sources of soil heat? How does the loss of soil heat occur? 3+2=5

5. (a) How does gaseous exchange take place between soil and atmosphere? 4

(b) Write short notes on the following : 2+2+2=6

(i) Thermal conductivity and diffusivity of soil

(ii) Heat capacity of soil

(iii) Role of soil aeration on plant and root growth

6. (a) Write the categories of soil taxonomy. What is soil pedon? 2+1=3

- (b) List the names of the soil orders in soil taxonomy and give the characteristics of each order. 7
7. Discuss the beneficial and harmful functions of soil micro-organisms affecting soil fertility. 10
8. (a) Discuss the properties and importance of soil colloids. 5
- (b) What are the factors affecting soil temperature? 5

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