No. of Printed Pages : 2

ET-531(B)

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2014

00746

ET-531(B) : SOIL SCIENCE

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any* ***five*** *questions. All questions carry equal marks. Give neat and well-labelled sketches where necessary.*

1. (a) Discuss the factors influencing soil formation. Give examples. *7*

(b) How do we determine the age of land/soil ? Discuss. *3*

(c) How do we quantify exchangeable ions ? *4*

2. (a) Discuss structural classification of soil. *8*

(b) Explain the following with respect to water : *6*

(i) Molecular structure

(ii) Polarity

(iii) Surface tension

3. (a) A 25 gm sample of soil was analysed. Its total concentration of exchangeable cations was found to be 1·75 meq; and exchangeable sodium was 1·2 meq. Express the CEC in meq per 100 gm of soil. Also find the exchangeable sodium in percent. *7*

(b) What is Lime Requirement (LR) of soil ? How is it determined ? What is understood by neutralisation ? *7*

4. Explain land evaluation systems, covering productivity, US criteria, and Food and Agriculture Organisation (FAO) criteria. Also discuss Arability and Irrigability of land. *14*

5. (a) Explain the action of ammonifying, nitrifying, and cellulose decomposing bacteria. *7*

(b) Discuss all types of fungi action in soil. *7*

6. (a) Explain the environmental factors influencing microbial activity. *8*

(b) Draw and explain soil moisture characteristic curve. *6*

7. Write short notes on any ***four*** of the following :

$4 \times 3\frac{1}{2} = 14$

(i) Nitrogen cycle

(ii) Humus synthesis

(iii) Nodule formation

(iv) Bio-fertilizers

(v) Soil aggregation

(vi) Plant disease resistance