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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular/Supplementary Examinations Nov. 2018

SOIL SCIENCE & SOIL MECHANICS

(Agriculture Engineering)

(Answer all Five Units **5 x 12 = 60** Marks)

Time :3 hours

Max.Marks:60

UNIT-I

1. **a.** Write about Black soils of India . **6M**
b. What is weathering? Explain in detail about chemical weathering of rocks and minerals along with chemical reactions. **6M**

OR

2. **a.** Differentiate between Eluviation and Illuviation **6M**
b. Differentiate between soil productivity and soil fertility. **6M**

UNIT-II

3. Explain soil management in detail. **12M**

OR

4. Define permeability and explain Darcy's law and factors effecting Permeability. **12M**

UNIT-III

5. Establish the relationship between degree of saturation, moisture content, specific gravity of soil particles and void ratio. What is meant by weathering? Describe its agents, process and effects on rocks. **12M**

OR

6. The Atterberg limits of a soil sample are: liquid limit = 50%, plastic limit = 30% and shrinkage limit = 15%. If the specimen of this soil shrinks from a volume of 10 cm³ at liquid limit to 5.94 cm³ when oven dried, calculate the shrinkage ratio and specific gravity of soil solids. **12M**

UNIT-IV

7. **a.** What is quick sand condition? Derive the expression for the critical hydraulic gradient. **6M**
b. Discuss the factors that influence the value of coefficient of permeability of a soil. **6M**

OR

8. In a variable head permeameter, the cross sectional area of the sample was 850 sq. cm and its length was measured as 11.2 cm. The head was noted to fall from 90 to 62 cm in 2 minutes. If the cross sectional area of the stand pipe was 2.8 sq.cm, find out the coefficient of permeability of the soil. If a drop of head is measured from 58 to 37 cm in the same experiment, determine the time required for the drop of head. **12M**

UNIT-V

9. **a.** What are the differences between compaction and consolidation? **6M**
b. What are the factors that affect the compaction of soil in the field? How will you measure? The compaction in the field? Describe a method with its limitation. **6M**

OR

10. What is the significance of compaction of soils. Describe how quality control is ensured in constructing an earthen embankment? **12M**

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