

**Reg. No:**

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

**B.Tech III Year I Semester Regular & Supplementary Examinations Nov/Dec 2019**  
**SOIL AND WATER CONSERVATION ENGINEERING**  
**(Agricultural Engineering)**

Time: 3 hours

Max. Marks: 60

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

**UNIT-I**

- 1 a Define soil erosion and explain the mechanics of splash erosion. **7M**  
b Explain the Universal Soil Loss Equation (USLE) in detail. **5M**

**OR**

- 2 a Calculate the annual soil loss from a given field subject to soil erosion for the given information: Rainfall erosivity index = 1000 tonnes/ha, Soil erodibility index = 0.20, Crop management factor = 0.50, Conservation practices factor = 1.0 and slope length factor = 0.1. Also explain how the soil loss is affected by soil conservation practices. **6M**  
b Explain briefly about factors affecting soil erosion. **6M**

**UNIT-II**

- 3 a Explain the agronomical measures for controlling the soil erosion. **6M**  
b Explain the wind erosion control measures. **6M**

**OR**

- 4 a Explain curve number method for estimation of runoff. **6M**  
b Explain in detail factors affecting wind erosion. **6M**

**UNIT-III**

- 5 a Derive equation for the height of contour bund **6M**  
b Design a 150 m long bench terrace for a land having an average slope of 20%. The soil is clay loam. The terrace channel has a uniform grade of 0.5%. Maximum 1-hr intensity of rainfall expected during the 10 year recurrence interval is 10 cm/hr. **6M**

**OR**

- 6 a Write about contour trenching. **4M**  
b Design a 350 m long graded bund in sandy loam soil on a land having an average slope of 3%. The bund channel is formed by embankment only. The horizontal distance between two adjacent bunds is 70 m. the land is having cultivated crop. The bund channel is on a grade of 0.1% for the first 100 m, 0.12% for the next 100 m and 0.14% for the rest. The 1- hr rainfall expected during the recurrence interval of 10 years is 10 cm/hr. **8M**

**UNIT-IV**

- 7 a Explain the factors affecting sediment distribution pattern. **8M**  
b Parabolic shape of grassed waterways is the most suitable shape, justify it. **4M**

**OR**

- 8 a Describe various factors affecting the shape of grassed waterways. **6M**  
b Write the procedure for preparation of a contour map. **6M**

**UNIT-V**

- 9 a Explain briefly about design of farm pond. **6M**  
b Explain the design components of permanent gully control structures. **6M**

**OR**

- 10 a Explain the design of wire mesh temporary gully control structure. **6M**  
b Explain the Trapezoidal and Simpson's rule for estimation of volume of earth work. **6M**

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