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

B.Tech IV Year I Semester Regular Examinations February-2022
SOIL AND WATER CONSERVATION ENGINEERING
(Agricultural Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

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|---|---|--|----|----|
| 1 | a | What are the agents causing soil erosion? | L1 | 2M |
| | b | Define Suspension, Saltation and Surface creep. | L1 | 2M |
| | c | What are the factors to be considered in graded bunding. | L1 | 2M |
| | d | Write a short note on trap efficiency. | L1 | 2M |
| | e | Write a note on hydraulic jump. | L1 | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

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|---|---|---|----|----|
| 2 | a | Write the equations of USLE, MUSLE and RUSLE and expand each parameter. | L1 | 6M |
| | b | Explain classification of gullies and gully development stages. | L1 | 4M |

OR

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|---|---|---|----|----|
| 3 | a | Discuss the Applications and Limitations of USLE. | L2 | 5M |
| | b | Describe about different mechanisms of water erosion. | L2 | 5M |

UNIT-II

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|---|---|---|----|----|
| 4 | a | Explain about different methods of estimation of peak rate of runoff. | L2 | 7M |
| | b | Write briefly about hydrological soil groups. | L1 | 3M |

OR

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| 5 | a | Describe land use capability classification. | L2 | 5M |
| | b | Explain agronomical and engineering measure to control erosion. | L2 | 5M |

UNIT-III

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|---|---|--|----|----|
| 6 | a | Design a contour bund for the following specific conditions given below:
The area of the field is 1200 m x 50 m having uniform slope of 3% in length wise direction. The soil type is sandy loam having medium to high infiltration rates. The soil cover is moderate during rainy season. The average annual rainfall of the region is 850 mm and one day maximum excess rainfall for 10 years recurrence interval is 900 mm. Take $X=0.6$ and $Y = 1.5$, As per soil conditions (sandy loamy soil), consider 2:1 and 5:1 as upstream and downstream slopes respectively. | L3 | 6M |
| | b | Explain about different types of trenches with neat sketch. | L2 | 4M |

OR

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|---|---|---|----|----|
| 7 | a | Briefly describe about the design and layout of bench terraces. | L2 | 6M |
| | b | Write the difference between Contour bund and Graded bund. | L1 | 4M |

UNIT-IV

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|---|---|--|----|----|
| 8 | a | Design a grassed waterway of parabolic shape to carry a flow of 2.6 m ³ /s down a slope of 3 percent. The waterway has a good stand of grass and a velocity of 1.75 m/s can be allowed. Assume the value of n in Manning's formula as 0.04. | L3 | 6M |
| | b | Describe the methods of in Stream Sediment Measurements. | L2 | 4M |

OR

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|---|---|--|----|----|
| 9 | a | List out the characteristics of contour. | L2 | 4M |
| | b | Discuss the Constructional Procedure and Maintenance of waterways. | L2 | 6M |

UNIT-V

- 10 a** Explain about various water harvesting techniques. **L2 5M**
b List out different types of farm ponds and briefly describe about embankment type farm pond. **L1 5M**

OR

- 11 a** Explain about different components of drop structures with neat sketch. **L2 6M**
b Explain about the design phases of gully control structures. **L2 4M**

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