

Code No: R1631352

R16**SET - 1****III B. Tech I Semester Regular Examinations, October/November - 2018****SOIL AND WATER CONSERVATION ENGINEERING**

(Agricultural Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) What are the different stages of gully development? [2M]
- b) What are the main difference between terrace and bunds. [2M]
- c) Determine the time of concentration ( $T_c$ ) for the watershed having length of 1500 m and longest water course slope is 0.6%. [2M]
- d) Enlist the different gully control structures? [3M]
- e) Estimate the peak rate of runoff ( $m^3/s$ ) from the watershed having an area of  $40 km^2$ , runoff coefficient is 0.40 and rainfall intensity is 4 cm/h. [3M]
- f) Enlist the different soil loss measurement tools. [2M]

**PART -B**

2. a) Define soil erosion and describe the factors influencing water erosion. [7M]
- b) Explain the Universal Soil Loss Equation for predicting soil loss. [7M]
3. a) What is mean by gully and describe the classifications of gully. [7M]
- b) Draw a straight drop spillway showing structural components and give the function of these components. [7M]
4. a) What do you understand by Bunding? Briefly explain about different type of bunds? [7M]
- b) Calculate the total length and earthwork of contour bund per hectare which is to be constructed on 5% land slope. The bund's spacing is to be maintained as 25 m, top width is 50 cm, bottom width is 125 cm, and height of bund is 100 cm, consider the lateral and side bunds also constructed in the field. [7M]
5. a) What are the different methods used to estimate the runoff? Explain any one. [7M]
- b) Calculate the discharge capacity of an earthen channel laid on a grade of 0.1% having 0.5 m bottom width, 1 m depth of flow and side slope 1.5: 1. Assume value of Manning's roughness coefficient as 0.0230. [7M]
6. a) What is mean by wind erosion? And list the Factor affecting wind erosion and also write its mechanics. [6M]
- b) Write a short note on Sediment delivery ratio and trap efficiency. [4M]
- c) Write about mode of sediment transportation. [4M]

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7. a) What is mean by farm ponds? What are the different types of farm ponds, explain any one. [7M]
- b) Calculate the capacity of farm pond using trapezoidal and Simpson's rule. The area enclosed by different contour of pond site are as below [7M]

| S No | Contour value (m) | Area enclosed (sq. m) |
|------|-------------------|-----------------------|
| 1    | 300               | 220                   |
| 2    | 301               | 250                   |
| 3    | 302               | 320                   |
| 4    | 303               | 370                   |
| 5    | 304               | 450                   |
| 6    | 305               | 530                   |
| 7    | 306               | 600                   |

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