KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agri. Engg) 2017Admission
IV Semester Final Examination- June 2019

Lwre.2206   Soil and Water Conservation Engineering (2+1)

Marks: 50
Time: 2 hours

1   **Define**   **(10x1=10)**

1   Soil erosion
2   Factors affecting water erosion
3   Wischmeir and Smith relationship between intensity of rainfall and total kinetic energy
4   Sediment delivery ratio
5   Sand dune
6   Erodibility of soil
7   Gabions
8   Contour wattling
9   Sheet erosion
10   Ramser's formula for spacing of bunds

II   **Write short notes on ANY FIVE of the following.**   **(5x2=10)**
1   Differentiate between contour bunds and graded bunds.
2   Differentiate between gully and ravine.
3   Land capability and the various limitations taken into account for capability classification.
4   Limitations of USLE.
5   Five indicators to show that a particular field has been eroded by water.
6   Different types of sediment load in a river flow.
7   Advantages of Parabolic shaped grassed water way over other shapes.

III   **Answer any FIVE of the following.**   **(5x4=20)**
1   Strip cropping and its different types with neat figures.
2   What are geotextiles? Explain how geotextiles are used for preventing erosion.
3   Calculate the area of protection from a wind break of 1km length and 15 m height. The angle of deviation of the prevailing wind perpendicular to the barrier is 30°. The actual wind velocity is 13km/h at 15m height and minimum wind velocity that is capable of moving the soil fraction is 15km/h at 15m height.
4   It is desired to construct bench terraces on a land along a hill slope of 20%. The vertical interval is to be maintained as 2m. The risers are to be laid on 1:1 gradient. Calculate the width of terraces and length of terraces per hectare.
5   Calculate the discharge capacity of a trapezoidal vegetated waterway having the following dimensions. Bottom width = 1m; Top width = 3m; Depth = 1m; Bed slope = 0.8% Manning's n =0.04

P.T.O

6 Calculate the length of waste weir to be provided on a bunding system laid in a watershed of area 50 ha. The head over the crest of the weir is to be maintained as 0.5m. The maximum rainfall intensity occurring in the watershed for a duration equal to the time of concentration is 7.0 cm/h. Assume runoff coefficient $C = 0.30$.

7 Compute the annual soil loss in tonnes/ha from a cultivated field using USLE. The USLE factors are given as

$K=0.40$ $R=175$ $LS=0.68$ $P=0.56$ $C=0.45$

IV   **Answer any ONE of the following**

$(1 \times 10 = 10)$

1 Outline the principles behind gully erosion control. Explain various temporary gully control structures. Give neat drawings of each measure.

2 Explain the measurement of soil erosion by field experiments. Discuss the instruments which are used in field experiments for erosion measurement

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