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

I **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 (1x10=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

****