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ET-537(A)

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

00039

June, 2014

ET-537(A) : SOIL CONSERVATION AND AGRONOMY

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any* ***seven*** *questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. What do you understand by soil erosion ? Explain the damages caused by it. Explain various factors involved in the Universal Soil Loss Equation (USLE) for estimation of soil loss. *4+6=10*

2. Explain the insect-pests of sugarcane crop. Explain control measures for five important insect or pests of sugarcane. *5+5=10*

3. Explain various flow conditions through a drop-inlet spillway corresponding to the slope conditions. Determine the flow capacity and type of flow from a drop-inlet spillway having 80 cm diameter and 20 m length. The elevations of inlet and outlet are 130 m and 129·6 m, respectively; and the headwater and tailwater elevations are 132 m and 128 m, respectively. The coefficients for entrance loss and frictional loss may be taken as 0·50 and 0·10, respectively. Make necessary assumptions. *6+4=10*

4. (a) Explain various types of bench terraces and their suitability criteria. *4*

(b) Design a 200 m long bench terrace for a land having an average slope of 20%. The terrace channel has a uniform slope of 0·5%. The peak runoff from the area is $2{\cdot}5 \times 10^{-2}$ m^3/s and the soil is clay loam. *6*

5. What is agricultural drainage ? Explain the benefits of good drainage. Also, give the classification of surface drainage systems. *2+3+5=10*

6. Derive the Hooghoudt's equation for computing the spacing of open drains to facilitate sub-surface drainage with uniform recharge in an area. *10*

7. Explain the advantages of puddling for rice transplantation. Explain various growth stages and nutrient management in rice. *2+4+4=10*

8. What are the benefits of in-situ rainwater harvesting practices ? Explain various methods used for rainwater harvesting in an area. *2+8=10*

9. (a) Explain the functions, limitations and important features of temporary check dams. *5*

(b) Explain two important methods of reclamation of alkali soils. *5*

10. Write short notes on any ***four*** of the following :

$4 \times 2\frac{1}{2} = 10$

(a) Contour bunding

(b) Land equivalent ratio

(c) Vertical drainage and bio-drainage

(d) Phases of wind erosion

(e) Ratoon crop management in sugarcane