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ET-537(A)

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

December, 2011

00412

ET-537(A) : SOIL CONSERVATION AND AGRONOMY

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions. Use of scientific calculator is allowed. The answers shall be in your own language.*

1. Differentiate between mechanics of gully and vill erosions. Calculate the annual and total soil loss from a watershed of 200 ha in 5 years having the following indices/factors : **3+5+2=10**

   R = 5000, K = 0.015 Mg/ha/year, L = 2.41, S = 1.20, C = 0.12, P = 0.45

   Comment on extent of soil loss and suggest corrective measures.

2. Explain the phases of wind erosion. Write equation for soil loss estimation due to wind erosion and explain different factors affecting wind erosion. Write four basic approaches to control soil erosion due to wind and compare effectiveness of these approaches. **3+4+3=10**

3. Distinguish between bench terrace and broad base terrace, from a certain region having K=0.01 Mg/ha/year, L=2.26, C=0.2 and P=0.6, the annual soil loss was reported as 14 Mg/ha. What maximum slope length and corresponding terrace spacing are needed to reduce the soil loss by half, if the existing slope is 8 per cent and slope length is 120 metre ? **4+6=10**

4. Discuss different measures for decreasing run off volume from a watershed. Design the notch dimensions of a temporary check dam for 2.5 m gully channel which has 500 litre per second average run off and 700 litre per second peak run off over last 10 years. Comment on the performance of the structure. **3+5+2=10**

5. Which structure can replace drop spillway where the fall is not more than 2 m and notch width is limited to 7 m ? Make a labelled diagram of the structure and explain its design features. What is the importance of hydraulic jump in a soil conservation structure ? **7+3=10**

6. What are different tile drain systems ? Explain their suitability and criteria for selection of different materials for tiles. Derive expression for tile depth assuming steady state condition. **3+2+5=10**

7. Explain cultivation of paddy specifying its varieties, fertilizer and manure, plant protection measures and methods for harvesting. Also list major rice producing states in India. **10**

8. Differentiate between the followings *(any four)* : **4x2.5=10**
   (a) Biotic and abiotic stresses
   (b) Soil-borne and air-borne pathogens
   (c) Systemic and non-systemic fungicides
   (d) Kamal bunt and lvosesmut diseases of wheat
   (e) Wettable powders and emulsifiable concentrates

9. How is improved rainfed farming different from irrigated farming ? What special steps are to be taken in rainfed farming particularly w.r.t. crop and variety selection, sowing methods and nutrient management ? **4+6=10**

10. Explain watershed management practices, its monitoring and evaluation methods giving examples. **10**