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ET-537(A)

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2019

00672

ET-537(A) : SOIL CONSERVATION AND AGRONOMY

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **seven** questions. All questions carry equal marks. Write answers in your own words. Give labelled diagrams whenever necessary.*

1. Briefly explain factors influencing soil erosion by water. Explain Universal Soil Loss Equation (USLE) along with significance of different factors involved. *10*

2. Explain the movement of soil particles in air by saltation during wind erosion. Determine the roughness factor "K" for a field having ridges of 150 mm spaced at 200 mm. What is the physical significance of K ? *10*

3. Explain the role of terrace in controlling soil erosion. How do you classify terraces based on cross-sectional shape ? For certain hilly watershed K = 0·1, l = 120 m, s = 7%, C = 0·2 and P = 0·6. This watershed experienced soil loss of 14 tonnes/ha/year. To reduce the soil loss by 70%, what slope length and corresponding terrace spacing would you recommend ? *10*

4. What are different stages in gully erosion ? Name different temporary gully control structures and explain any two in detail along with their limitations. *10*

5. What are the limitations of surface drain system ? Derive Hooghoudt's equation for drain spacing. What are the advantages and limitations of this equation ? *10*

6. What are different methods of ameliorating salt affected soils ? Calculate the volume of water required for leaching a 20 ha land having EC = 12 dSm^{-1}. It is proposed to grow tomatoes in this field (Recommend EC = 2·5 dSm^{-1}). Given that the effective root zone depth to be improved is 1·4 m and available irrigation water has EC = 2·0 dSm^{-1}. Assume saturation percentage = 40, specific gravity of soil = 1·6. Make any other relevant assumptions. *10*

7. Explain nutrient management in Direct Seeded Rice (DSR) and Irrigated Transplanted Rice (ITR). Also, list different diseases in rice crop and their control mechanism. *10*

8. How do you classify watersheds ? Explain watershed based water management. What are measures to ensure "water to every field" ? *10*

9. Write short notes on any ***four*** of the following : $4 \times 2\frac{1}{2} = 10$

(a) Integrated Pest Management

(b) Integrated Nutrient Management

(c) ULV Sprayers

(d) Bio-fertilizers

(e) Agricultural Droughts

(f) Mole Drainage
