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B.E. / B. Tech (Full-Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2012

CIVIL ENGINEERING

SIXTH SEMESTER

(REGULATIONS 2009)

CE 9352 – IRRIGATION ENGINEERING

Time : 3 hr

Max Marks : 100

Instructions: Draw neat sketches wherever necessary.

PART - A (10x2 = 20 Marks)

Answer ALL Questions

1. What are the two broad categories of irrigation?
2. State the methods available for the measurement of infiltrated water both in the case of check basin and furrow irrigation.
3. Plot the S-curve indicating the critical stages of crop growth.
4. Draw a schematic sketch revealing the Soil-Water-Plant relationship.
5. In a one ha. field, 7000 m^3 of water was applied when the water content was 5%. The depth of root zone, the dry weight of soil and the water loss due to evaporation were found to be 1.5 m, 1.6 gm/cm^3 and 10% respectively. Determine the field capacity of the soil.
6. Sketch a diversion headwork indicating all the important components.
7. Brief the chemistry behind the leaching process.
8. What is microscopic leveling and where it is applicable?
9. How would you achieve better application efficiency in the field?
10. Draw the organogram of the Water Users' Association.

PART B

(5 x 16 = 80 Marks)

11. Explain the direct and indirect methods used for the determination/estimation of crop water requirement, with their merits and demerits. (16)
12. (a) (i) Discuss on the advantages and ill effects of irrigation. (8)
(ii) Explain the irrigation aspect of the National Water Policy, 2002. (8)

OR

12. (b) With the help of a neat sketch explain the working of a neutron probe used in measuring soil moisture and compare this with the conventional gravimetric method. (16)

13. (a) Design an irrigation channel to carry 40 cumecs of discharge. The channel is laid at a slope of 16 cm/km. The critical velocity ratio 'm' for the channel is 1. Use Kutter's rugosity coefficient as 0.0225 and the side slope of the channel as 0.5H : 1V. (16)

OR

13. (b) (i) Elaborate on the types of lining highlighting their advantages too. (8)

13. (b) (ii) Sketch a canal regulator and explain the location and functions. (8)

14. (a) With neat sketches describe the drainage patterns and types, bringing out the uniqueness of each type. (16)

OR

14. (b) (i) Compare and contrast sprinkler irrigation with drip irrigation. (8)

14. (b) (ii) Describe how degradation of soil takes place and give the ways and means of reclaiming it. (8)

15. (a) Elaborate on the different tools that can be used for getting information through the participatory technique for planning any irrigation project. (16)

OR

15. (b) (i) Elucidate the functions of on-farm-development works. (8)

(ii) Inter-disciplinary approach is need for irrigation water management – Discuss. (8)