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B.E / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/ MAY 2011

AGRICULTURAL AND IRRIGATION ENGINEERING BRANCH

FIFTH SEMESTER

AI 9301 – IRRIGATION ENGINEERING

(REGULATIONS 2008)

Time : 3 hours.

Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. What is meant by Duty and Delta of canal water?
2. Find the delta for a crop when its duty is 854 hectares/cumecs on the field, the base period of this crop is 120 days.
3. Differentiate between Alluvial and Non-Alluvial canals.
4. Write briefly about sprinkler irrigation
5. Draw a neat sketch of a River-regulator.
6. Differentiate between silt excluder and silt ejector.
7. What is meant by meandering of a river? How is it formed?
8. Differentiate between weir and barrage.
9. Give the reasons for failure of kudimaramath in Tamil Nadu.
10. What is a warabandi system?

Part – B (5 x 16 = 80 Marks)

11. i) Determine the field capacity of a soil for the following data:
Depth of root zone= 1.80 m, existing moisture = 8%, Dry density of soil=1450 Kg/m³, Quantity of water applied to soil= 650 m³, Water loss due to deep percolation and evaporation = 10% Area to be irrigated =1000m³. (5)
ii) Name any two methods used for estimating consumptive use of water for a particular crop at a particular place. Explain in details the one which is most widely used in your region, and the reason for preferring that particular method. (8)
iii) Write short note on Crop rotation and consumptive use and its estimation. (3)
12. a. Classify various methods of irrigation. Explain in details about the types of surface irrigation and subsurface methods with a neat sketch. (16)
or
b. i) Describe the widely used type of tube well with a neat sketch. (8)
ii) Enumerate the methods which are used for determining the yield of dug well. Discuss briefly any one of these methods. (6)
iii) Write short notes on water-shed canals and contour canals. (2)
13. a. i) How does a diversion weir aligned? Draw a neat sketch showing the different components a diversion weir scheme. (7)
ii) What are the Divide walls and how do they help in a diversion weir schemes? Draw neat sketches showing the cross-section of a divide walls on pucca floor as

well as beyond discuss the design considerations that are involved in design (9)

- b i) What is meant by (2)
ii) Explain how affects the design of gravity dams? What measures can be taken to avoid undesirable effects due to uplift in such cases? (10)
iii) Differentiate between rigid and non-rigid dams giving examples of each type. (4)

14. a i) Draw the typical cross-section headwork's and mention the function of each component. (16)

ii) What is meant by canal drops constructed in a canal system?

- b i) Explain why trapezoidal notches are preferred to rectangular notches in the design of canal drops. (6)
ii) The culturable command area of a watercourse is 1200 hectares. Intensities of sugarcane and wheat are 60% and 40% respectively. The duties for the crops at the head and tail are 730 hectares/cumec and 1800 hectares/cumecs, respectively. Calculate the discharge required at the head of the watercourse (b) and the discharge at the outlet, assuming a time factor equal to 0.8. (6)
iii) With a neat sketch show the design of an aqueduct and siphon passage. (4)

15. a i) Draw a farmer organization structure in Tamil Nadu and explain briefly. (16)

- b i) Describe the organization required for irrigation management, mentioning briefly the organization at different levels. What are the essential requirements for an efficient organization? (10)
ii) What steps do you recommend for improving irrigation efficiency? (6)