

Dec.-22-0295

CE-703 (Irrigation and Design of Hydraulic Structures)

B.Tech. 7th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, select one question from each sections A, B, C and D. Section E is compulsory.

SECTION - A

1. Briefly describe the necessity and importance of irrigation works in our country. What are different types of irrigation? Write brief notes on each of them. (10)
2. (a) What are the benefits that can be accrued from Irrigation projects?
(b) What is 'flood irrigation'? Where is it practiced? (10)

SECTION - B

3. (a) Define Duty and Delta and derive their relationship.
(b) What is meant by 'Flow duty' and 'Quantity duty'? (10)
4. 800 m³ of water is applied to a farmer's rice field of 0.6 hectares. When the moisture content in the soil falls to 40% of the available water between the field capacity (36%) of the soil and permanent wilting point (15%) of the soil crop combination, determine the fields application efficiency. The root zone depth of rice is 60 cm. Assume porosity = 0.4. (10)

SECTION - C

5. (a) What is meant by the term low dam? Determine the dimensions of the elementary profile of a low gravity dam.

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- (b) Explain the criteria that govern the design of a high gravity dam in different zones of its cross section. (10)

6. Design the practical profile of a gravity dam made of stone masonry given the following data:

R.L. of base of dam = 198 m

R.L. of HFL of reservoir = 228 m

Specific gravity of masonry = 2.4

Safe compressive stress in masonry = 1200kN/m² (10)

SECTION - D

7. (a) What is difference between a weir and barrage? Why is a barrage preferred to a weir in modern days?
(b) How is a diversion weir aligned? Draw a neat sketch showing the different components of a diversion weir scheme. (10)
8. (a) What is meant by falls and where are they located?
(b) Discuss briefly the components of various types of falls with neat sketches. Also discuss the suitability of each type. (10)

SECTION - E

9. Answer the following questions in brief.
(a) Name the methods for control irrigation.
(b) What do you mean by "border flooding"?
(c) Write a brief note on 'sodium hazards of irrigation water'.
(d) Write crop seasons and their respective crops.

[P.T.O.]

- (e) Explain consumptive use and consumptive irrigation requirement of crop in brief.
- (f) Describe the Outlet factor of water requirement of crops.
- (g) Merits and demerits of weir and barrage.
- (h) What is purpose of constructing of sheet piles and divide wall?
- (i) What is meant by an "Intake weir"?
- (j) Distinguish between vertical fall and Sarda's fall.

(10×2=20)