

Roll No. ....

Total Pages : 3

**002703**

**December 2023**

**B.Tech. (Civil) VII Semester**

**IRRIGATION ENGINEERING (PEC-CV405-1)**

Time : 3 Hours]

[Max. Marks : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

**PART-A**

1. (a) Explain the concept of duty and delta in irrigation. (1.5)
- (b) What are the primary functions of barrages and weirs in hydraulic engineering? (1.5)
- (c) Define the term "irrigation crop requirement." (1.5)
- (d) Explain the process of estimating crop water requirements. (1.5)
- (e) What is a canal fall, and why is it important in canal design? (1.5)
- (f) What are the primary objectives of designing canal falls in irrigation systems? (1.5)

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- (g) Describe the principles governing the soil-water-plant relationship in agriculture. (1.5)
- (h) Discuss the different types of canal lining used in irrigation. (1.5)
- (i) Explain the concept of waterlogging in the context of irrigation. (1.5)
- (j) Describe the design principles for earthen dams. (1.5)

**PART-B**

- 2. (a) Analyze the significance of transitions and cross drainage works in canal design. What considerations are important in their design and construction? (10)
- (b) Describe the process of estimating crop water requirements. (5)
- 3. (a) Describe the design considerations and principles for head and cross regulators in irrigation systems. (5)
- (b) Discuss the concepts of duty and delta in irrigation. Explain the relationship between these terms and how they are used to determine the water requirement for a particular crop. (10)
- 4. What are the primary types of dams, and what factors are considered in selecting the most suitable type for a specific location or purpose? Draw and explain various types of dams. (15)

- 5. (a) Explain the concept of canal falls and the different types of canal falls used in hydraulic engineering. (5)
- (b) Explain the principles and methods involved in the analysis of surface and sub- surface flow at hydraulic structures. (10)
- 6. (a) Explain the causes and consequences of waterlogging in agricultural fields. Discuss effective strategies to prevent or mitigate waterlogging problems. (10)
- (b) Explain the principles and considerations involved in the design of irrigation canals, including both lined and unlined channels. (5)
- 7. Define the terms "crop period" and "base period" in the context of estimating crop water requirements. How do these periods relate to irrigation planning, and what factors should be considered when determining them for different crops? (15)