

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - VII EXAMINATION - WINTER 2025

Subject Code: 2170609

Date: 28-11-2025

Subject Name: Irrigation Engineering

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	Marks
Q.1 (a) Describe scope of Irrigation Engineering.	03
(b) What are the benefits and ill effects of irrigation?	04
(c) Define the term 'Duty' and 'Delta'. Derive a relation between the two.	07
Q.2 (a) List various irrigation efficiencies and explain any one from that.	03
(b) What are the different types of irrigation methods? Explain border strip method of irrigation.	04
(c) Compare Drip irrigation method with Sprinkler irrigation method.	07
OR	
(c) A field channel has a culturable commanded area of 2000 hectares. The intensity of irrigation for crop Gram is 30% and for crop Wheat is 50%. For Gram kor period is 18 days and kor depth is 12 cm. For Wheat kor period is 15 days and kor depth is 15 cm. Calculate the discharge of the field channel required.	07
Q.3 (a) Distinguish between a weir and a barrage.	03
(b) What are the limitations of Bligh's creep theory?	04
(c) Enlist the various forces acting on gravity dam as per IS: 6512 and discuss in detail water and wave pressure.	07
OR	
(a) Write a short note on: Divid wall	03
(b) Enlist diversion headwork component parts and draw its layout of a neat sketch.	04
(c) Discuss in brief the causes and failure of earthen dams.	07
Q.4 (a) Define: (1) Dam (2) Hydraulic height of dam	03
(b) Differentiate Jump Height Curve (J.H.C) and Tail Water Curve (T.W.C).	04
(c) Define spillway. What is the purpose to provide it? What are essential requirements?	07
OR	
(a) Write short on: Drainage gallery	03

- (b) Discuss hydraulic jump as energy dissipation device. 04
 - (c) What is meant by energy dissipator? Discuss the various methods used for energy dissipation below spillways. 07
- Q.5**
- (a) What is canal fall? Why is it necessary to provide a fall in a canal? 03
 - (b) Describe Kennedy's theory for the design of irrigation canal in alluvial soil. 04
 - (c) What is escape? What are different types of escapes? Explain the working of any one of them. 07

OR

- (a) What do you understand by water-logging? What are the causes of water-logging? 03
- (b) What are the ill effects of water-logging? How would you prevent water-logging? 04
- (c) Design an irrigation channel in alluvial soil according to Lacey's silt theory using following data: Full supply discharge = $15 \text{ m}^3/\text{s}$, Lacey's silt factor = 1.0, Side slopes = $\frac{1}{2}: 1$ 07
