

Enrolment No./Seat No\_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3170609

Date:20-11-2025

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) Explain (i) Field capacity (ii) wilting point (iii) Hygroscopic water **03**
- (b) Draw a neat and clean sketch of canal section partially in cutting and partially in filling . Enlist components of a canal section . **04**
- (c) Following is data about the crop . Taking a time factor of 0 .70 calculate the discharge required at the head of canal . If the canal capacity factor is 0.80 determine the design discharge . **07**

Crop	Base period days	Area ha	Duty at the head of canal (ha/cumec)
Suger cane (All weather )	360	850	590
Bajra (kharif)	120	700	2050
wheat (Rabi)	120	550	1550
Vegetables (Hot weather )	120	150	800

- Q.2** (a) Enlist Balanced depth of canal . **03**
- (b) Explain ill effects of water logging . **04**
- (c) Draw schematic layout of a barrage and explain the functions of each component of the barrage . **07**

**OR**

- (c) Enlist various methods of Application of irrigation water and explain Basin and Furrow Irrigation methods. **07**

- Q.3** (a) Explain canal escape and its function . **03**
- (b) Enlist forces acting on Gravity dam and explain (i) Gravity force and (ii) Earthquake forces. **04**
- (c) Design an irrigation channel to carry an discharge of 4.90 Cumecs Take  $m=1.1$  ,  $N=0.0224$  and B/ D Ratio 4.50. **07**

**OR**

- Q.3** (a) Explain difference between Gross Command area and Culturable Command Area **03**
- (b) Explain Bligh's creep theory for the design of wear on pervious foundations **04**
- (c) Give classification of Dam with brief description and sketch **07**

- Q.4** (a) Explain exit gradient **03**

- (b) Describe Water resources potential in India **04**
- (c) What is canal in regime ? Give difference between Kennedys and Lacey's method **07**
- OR**
- Q.4** (a) Give scope and necessity of Irrigation. **03**
- (b) Explain (i) Duty and (ii) Delta **04**
- (c) Describe different methods of prevention of Water logging **07**
- Q.5** (a) Give list of crops in Rabi and Kharif seasons **03**
- (b) Explain (i) Capacity factor and (ii) Time factor **04**
- (c) Enlist different cross drainage works and explain Siphon aqueduct with sketch **07**
- OR**
- Q.5** (a) Explain (i) Water conveyance efficiency and (ii) Water Application efficiency . **03**
- (b) What is a Fall in canal structure ? Why it is necessary ? Explain Rapid and stepped fall . **04**
- (c) Describe Cross Regulator and head Regulator with its function . **07**

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