

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024

Subject Code: 2170609**Date:30-05-2024****Subject Name: Irrigation Engineering****Time: 02:30 PM TO 05:00 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.

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|-------------|---|-----------|
| Q.1* | (a) What is balanced depth for a canal section? | 03 |
| | (b) With sketch explain Aqueduct? In which situation it is provided? | 04 |
| | (c) The culturable Command of water course is 2000 hectare. Intensities of Irrigation of sugarcane and rice crop is 20 % and 30 % respectively. The duties of the crops for sugarcane and rice at the head of canal is 1600 ha/cumec and 800 hectare/cumec respectively. Find the discharge required at the head of water canal if losses in canals is 15 % | 07 |
| Q.2 | (a) Enlist forces acting on gravity dam and explain any one force in detail | 03 |
| | (b) Explain (i) Field capacity (ii) Wilting point | 04 |
| | (c) The details of base period and duty of different crops are given in below table for a Irrigation system. Determine the reservoir capacity, if canal losses are 15% and reservoir losses are 10 % . Consider culturable command area as 15500 ha | 07 |

Crop	Base period days	Duty of water at the field (hectare /cumec)	Intensity of irrigation (%)
Sugarcane	360	1750	20
Rice	120	900	20
Wheat	120	1800	25
Cotton	180	1350	15
Vegetables	120	1000	20

OR

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|------------|--|-----------|
| | (c) Explain Kennedy's method of canal design | 07 |
| Q.3 | (a) Explain Duty and delta also derive the relationship in-between. | 03 |
| | (b) Explain different types of earthen dam with sketch | 04 |
| | (c) Explain Bligh's creep theory. further explain what is exit gradient? | 07 |
| OR | | |
| Q.3 | (a) Why falls are provided in canal? Explain Sarda type fall. | 03 |
| | (b) Draw typical sketch of canal in partial cutting and partial filling. | 04 |
| | (c) Draw layout of barrage and explain different components. | 07 |

- Q.4** (a) Explain (i) Check basin method of Irrigation. (ii) Ring basin method **03**
 (b) What is phreatic line? Explain How seepage is controlled in earthen dam. **04**
 (c) Explain causes and remedial measures for water logging **07**
- OR**
- Q.4** (a) What is the function of spillway? Draw ogee spillway with sketch **03**
 (b) Explain (i) Berms (ii) Dowla (iii) Free board (iv) Full Supply level **04**
 (c) Give classification of canal as per different aspects. **07**
- Q.5** (a) What is the function of canal escape? explain escape with sketch. **03**
 (b) Explain (i) Capacity factor (ii) Time factor **04**
 (c) Describe benefits and ill effects of irrigation **07**
- OR**
- Q.5** (a) Explain different types of weirs. **03**
 (b) What is Importance of lining in canal? **04**
 (c) Explain Sprinkler and Drip Irrigation systems with layout plans and explain functions of each component **07**
