

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024

Subject Code:2170609

Date:11-12-2024

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

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|------------|--|-----------|
| Q.1 | (a) Explain scope of irrigation project. | 03 |
| | (b) Define canal head works. List functions of a canal head works. | 04 |
| | (c) Discuss bucket type energy dissipators with neat sketch. | 07 |
| Q.2 | (a) Differentiate between wide flooding and free flooding. | 03 |
| | (b) Discuss Surplus canal escape is the safety valve in a canal system | 04 |
| | (c) Write a short note on Land reclamation. | 07 |
| | OR | |
| | (c) Discuss various silt control devices used for sediment control in the offtaking channel. | 07 |
| Q.3 | (a) Define with sketch: Axis of gravity dam, Hydraulic height of dam & Dam | 03 |
| | (b) Write a short note on Kennedy's theory. | 04 |
| | (c) Explain volumetric assessment of irrigation water. What are its drawbacks? | 07 |
| | OR | |
| Q.3 | (a) Justify silt excluder and silt ejecter. | 03 |
| | (b) The GCA of an irrigation project is 1 lac hectares. The CCA is 75% of GCA. The intensities of irrigation for kharif & Rabi crops are 50% and 55% respectively. If the duties for kharif & Rabi crops are 1200 hact/cumes and 1400 hact/cumes respectively, determine the discharge at the head of canal considering 25% provision for the transmission loss, overlapping allowances, evaporation etc. | 04 |
| | (c) Explain the salient features of the drip irrigation system. What are the advantages and disadvantages of the drip irrigation? | 07 |
| Q.4 | (a) Differentiate between a permanent canal and an inundation canal. | 03 |
| | (b) Explain stability requirements of gravity dam. | 04 |
| | (c) Describe with the help of sketch various forms of soil moisture. Which of this moisture is mainly available for utilization by the plants? | 07 |
| | OR | |
| Q.4 | (a) Define the term: Capacity factor, Kor period, Intensity of irrigation. | 03 |
| | (b) Differentiate Jump Height Curve and Tail Height Curve. | 04 |
| | (c) Write a short note on Keys and water stops. | 07 |
| Q.5 | (a) List factors should be considered while selecting the most suitable type of C.D. work. | 03 |
| | (b) Describe check basin flooding method of irrigation. | 04 |

- (c) Design a lined concrete channel, trapezoidal in section to carry a discharge of 200 cumec at a slope of 30 cm/km. The Mannings $N=0.017$, and side slope are 1.5:1. The limiting velocity in the channel is 2m/s. **07**

OR

- Q.5** (a) Define energy dissipators with its needs **03**
(b) Write a brief note on history of irrigation development in India. **04**
(c) Explain Khosla's method of independent variables. **07**
