

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3170609****Date:15/12/2021****Subject Name:Irrigation Engineering****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

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

		MARKS
Q.1	(a) Define crop ratio, field capacity and wilting point.	03
	(b) What are the benefits and ill effects of irrigation?	04
	(c) Explain with neat sketch classification of soil-water in detail.	07
Q.2	(a) What is irrigation efficiency? Explain any two efficiencies in detail.	03
	(b) Differentiate between weir and barrage.	04
	(c) Develop a relationship between depth of irrigation water, field capacity, permanent wilting point, root zone depth and dry density of soil. Knowing the daily evapotranspiration how you will decide the irrigation interval.	07
	OR	
	(c) Compare surface irrigation with sprinkler irrigation.	07
Q.3	(a) Explain classification of Irrigation canal in detail.	03
	(b) Explain the function of the following: Divide wall, Under sluice, Fish ladder and Upstream block protection.	04
	(c) Explain the Bligh's creep theory with limitations and design criteria.	07
	OR	
Q.3	(a) Give classification of dams.	03
	(b) Define and explain phreatic line in earthen dams.	04
	(c) Using Bligh's creep theory, calculate thickness of downstream floor at every 5 m from the downstream end. Also check whether the floor length is sufficient. Use the following details:	07
	(i) Length of upstream floor = 20 m	
	(ii) Length of downstream floor = 30 m	
	(iii) Head on upstream side = 4 m	
	(iv) Head on downstream side = 0 m	
	(v) Depth of upstream pile = 5 m	
	(vi) Depth of downstream pile = 6	
	(vii) Bligh's Creep coefficient, C = 18	
	(viii) Weight density of concrete = 24 KN/m ³	

- Q.4** (a) Differentiate between alluvial and non-alluvial canal. **03**
(b) Give the comparison between Kennedy's and Lacey's theory. **04**
(c) Explain the procedure for designing an irrigation channel using Kennedy's theory, when Q , N , m and S are given. **07**

OR

- Q.4** (a) Give necessity of lining in canal. **03**
(b) Explain the term "most economical cross sections in canal". **04**
(c) Design an irrigation canal to carry discharge of 5 Cumecs. Take $m = 1.0$, $N = 0.0225$ and B/D ratio = 4.40. **07**
- Q.5** (a) Define super passage, aqueduct and siphon aqueduct. **03**
(b) Why canal falls are provided? Explain any one type of canal fall. **04**
(c) Discuss functions of head regulator and cross regulator. **07**

OR

- Q.5** (a) Discuss canal escapes in brief. **03**
(b) Write a note on land reclamation. **04**
(c) Discuss causes of water logging. What are the remedial measures for it? **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3170609****Date:08/06/2022****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.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Distinguish between a weir and a barrage | 03 |
| | (b) Enumerate various types of lining. Also give necessity of canal lining. | 04 |
| | (c) Discuss scope of irrigation engineering | 07 |
| Q.2 | (a) Why it is necessary to provide a fall in a canal? | 03 |
| | (b) Explain irrigation system based on source from which water is drawn. | 04 |
| | (c) Describe various causes of failures of a weir on pervious foundation and their control measures. | 07 |
| | OR | |
| | (c) Design lined trapezoidal shaped concrete canal in a section to carry a discharge of 350 cumec at a slope of 20 cm/km. Take Manning's coefficient as 0.017, side slope of 1.5:1 and B/D = 4. | 07 |
| Q.3 | (a) Define following terms:
(1) Permanent wilting point (2) Readily available moisture
(3) Intensity of irrigation | 03 |
| | (b) Enumerate important parts of a gravity dam and write brief note on drainage galleries. | 04 |
| | (c) Explain Khosla's method of independent variables. | 07 |
| | OR | |
| Q.3 | (a) Define canal outlet. Write brief note on any one type of canal outlet. | 03 |
| | (b) Discuss various factors to be considered while selecting suitable site for a dam | 04 |
| | (c) Define term duty. Also discuss various factors affecting duty of water. | 07 |
| Q.4 | (a) Write a short note on contraction joints in a dam. | 03 |
| | (b) Explain following terms for canal cross-section.
(1) Berm (2) Spoil Banks | 04 |
| | (c) Discuss various reasons for hydraulic and seepage failure of earthen dams. | 07 |
| | OR | |
| Q.4 | (a) State function of following canal regulatory works.
(1) King's vanes (2) Curved wings (3) Bed bars | 03 |
| | (b) Enlist various components and limitations of sprinkler irrigation system | 04 |
| | (c) Explain stepwise procedure for designing an alluvial channels using Kennedy's theory. | 07 |
| Q.5 | (a) Write functions of cross regulator. | 03 |
| | (b) Discuss various drainage systems used for effective control of water logging. | 04 |

- (c) Enumerate various forces acting on a gravity dam. Discuss uplift pressure, wave pressure and silt pressure briefly. **07**

OR

- Q.5** (a) Write a brief note on parshall flame. **03**
(b) Differentiate between: **04**
 (1) Aqueduct and super passage
 (2) Syphon aqueduct and canal siphon
(c) Describe various causes and preventive measures of water logging. **07**
