Seat No.: _____ Enrolment No._____

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: (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	**07**

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**

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Seat No.: _____ Enrolment No._____

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
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 co-efficient 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: (1) Aqueduct and super passage (2) Syphon aqueduct and canal siphon	**04**
	(c)	Describe various causes and preventive measures of water logging.	**07**

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