

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2170609

Date:16/05/2019

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.

		MARKS
Q.1	(a) Define: Water application efficiency, Water conveyance efficiency and water distribution efficiency.	03
	(b) Explain with neat sketch classification of soil-water in detail.	04
	(c) What do you understand by scope of irrigation project?	07
Q.2	(a) Define saturation capacity, field capacity and wilting point.	03
	(b) Design a channel for discharge of 100 cumecs having maximum permissible velocity of 2 m/sec. The available bed slope is 1 in 2500. Assume Manning's $N = 0.013$ & side slope is 1.1.	04
	(c) Explain the terms (i) Duty (ii) Delta and (iii) Base period. Derive the relation between Duty, Delta and Base period.	07
	OR	
	(c) Describe with neat sketches various methods adopted for controlling seepage through the body of an embankment dam and through foundation.	07
Q.3	(a) Differentiate between weir and barrage.	03
	(b) Give classification of various irrigation methods.	04
	(c) With the help of neat sketches explain the working of the following components of a weir: silt excluder and fish ladder.	07
	OR	
Q.3	(a) Explain classification of Irrigation canal in detail.	03
	(b) What are the limitations of Kennedy's theory?	04
	(c) Describe Bligh's Creep Theory for the design of weirs over pervious foundation.	07
Q.4	(a) With a neat line sketch, explain aqueduct.	03
	(b) With the help of a neat sketch explain the working principle and utility of parshall flume in flow measurements of irrigation channels.	04
	(c) What is canal fall? Why is it necessary to provide a fall in a canal? Explain with sketch Ogee falls.	07
	OR	
Q.4	(a) Explain uplift forces and arrangements done in the gravity dam to release uplift forces.	03
	(b) Discuss in brief the causes and failure of earthen dams.	04
	(c) Discuss the causes and remedial measures of water logging.	07
Q.5	(a) Explain the terms for canal cross-section. (i) Borrow pits, (ii) Spoil Banks, (iii) Berm.	03
	(b) Develop an expression for floor thickness of a weir to resist water pressure by self weight.	04
	(c) The GCA for an irrigation canal is 20,000 hectares out of which 75% is CCA. The intensity of irrigation is 40% for Rabi and 10% for rice. If kor period is 4 weeks for Rabi and 2.5 weeks for rice, determine the outlet discharge. Outlet	07

factors for Rabi and rice may be assumed as 1800 ha/cumecs and 800 ha/cumecs. Also calculate delta for each case.

OR

- Q.5**
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|------------|--|-----------|
| (a) | Draw sectional view of a typical barrage. Compare different aspects of a weir and barrage. | 03 |
| (b) | Write design procedure for Sarda type of fall. | 04 |
| (c) | Give a comparison of sub surface drainage and surface drainage used for land reclamation. | 07 |

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