Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER– VI • EXAMINATION – SUMMER 2014

Subject Code: X60603 **Date: 03-06-2014**

Subject: 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.**

Q.1	**(a)**	Give the differences between, Bligh's theory, Lane's theory and Khosla's theory	**07**
	(b)	Highlight the advantage, suitability mechanism for pitcher irrigation	**07**
Q.2	**(a)**	Draw longitudinal section of a vertical drop weir and describe the function of each component	**07**
	(b)	Draw a section through ski jump bucket type of spill way to describe its suitability and energy dissipation mechanism with salient features.	**07**
		OR	
	(b)	State the design considerations of earthen dams in earthquake regions.	**07**
Q.3	**(a)**	Draw plan and sectional view of a fish ladder to explain its working and discuss its importance in relation to fish migration trends.	**07**
	(b)	Give the classification of canals based on alignment .Give the relative advantage of each type of alignment	**07**
		OR	
Q.3	**(a)**	Draw a proportionate sketch of an aquaduct. Analyze the hydraulic forces acting on the side and bottom of the siphon aquaduct.	**07**
	(b)	(i)Discuss the necessity of irrigation in monsoon type of climate . (ii)Analyze the development of irrigation in modern India.	**07**
Q.4	**(a)**	Draw section of a non homogeneous type of earthen dam and describe the components	**07**
	(b)	A field channel has a culturable command area of 2000 hectares. The intensity of irrigation for gram is 30% and that for wheat is 50%. Gram has kor period of 18 days and kor depth of 12 cm, while wheat has a kor period of 15 days and kor depth of 15 cm. Calculate the discharge of the field channel.	**07**
		OR	
Q.4	**(a)**	Explain the various stability tests that are to be applied to the trial section of practical profile of gravity dam	**07**
	(b)	A siphon spill way has a throat height 1.5 meter and width of 4 meter. At the design flow the effective head causing the flow is 2 meter. Taking the coefficient of discharge as 0.6 determine the capacity of the siphon. Determine the head that would be required on an ogee spillway 4 meter long to discharge this flow if coefficient of discharge is 2.25	**07**
Q.5	**(a)**	Explain and develop the middle third rule for elementary profile of a gravity dam	**07**
	(b)	The discharge available from a tube well is 120 m^3/ hour. Assuming 3200 hours of working from a tube well in a year estimate the culturable area that the tube well will command. The intensity of irrigation is 50% and the average depth of irrigation is 48 cm.	**07**
		OR	

Q.5	**(a)**	Draw section of a gravity dam showing the shafts ,galleries and sluices provided in the section and state their functions.	**07**
	(b)	(i)State the disadvantage of canal lining (ii) Given the value of limiting velocity ‘V’ the rugosity coefficient ‘N’ and the longitudinal slope ‘S’ give the steps for design of a lined canal trapezoidal section.	**07**

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