Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2013

Subject code: 1721203 **Date: 31-12-2013**

Subject Name: Design of Canal Network and Regulation Work

Time: 10.30 am – 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)**	Compare Kennedy's silt theory and Lacey's silt theory. Discuss the limitation in their applicability.	**07**
	(b)	Explain briefly the different preventive methods for control of entry of silt into canals.	**07**
Q.2	**(a)**	Enumerate the various considerations which govern the selection of the optimum alignment of a canal.	**07**
	(b)	Name different types of lining done on the channels. What are the factors that influence the choice of a particular type of lining?	**07**
		OR	
	(b)	Design an irrigation canal in clayey alluvial soil for Full Supply Discharge of 30 cumecs, coefficient of roughness= 0.025, canal side slope=1:1, longitudinal slope 1 in 5000. Also check for critical velocity ratio, allowable CVR is 0.9 to 1.1. Assume depth=2.0m.	**07**
Q.3	**(a)**	Define sensitivity and proportionality of an outlet. Derive the relation between them.	**07**
	(b)	A siphon aqueduct has single barrel of 3m diameter, length=95m, discharge capacity =28 cumecs, f=0.013, coefficient of i) bend loss (2 No.)=0.10 ii) expansion at outlet= 0.2 iii) contraction at inlet= 0.1.Determine afflux. Neglect velocity of approach.	**07**
		OR	
Q.3	**(a)**	Distinguish between a modular and a semi-modular outlet. Give one example of each.	**07**
	(b)	Design the canal transition both contraction and expansion of a cross drainage work for the following data using Mitra's formula: FSD=32 cumecs, FSL=210m, canal bed level=209m, canal bed width=20m, canal water depth=1m, trapezoidal section with 1.5H to 1V slope.	**07**
Q.4	**(a)**	Compare silt ejector and silt excluder.	**07**
	(b)	Explain how distribution of water into the field through water course is planned in canal network planning.	**07**
		OR	
Q.4	**(a)**	Discuss the factors to be considered in the selection of alignment of main canal and its branches in canal network.	**07**
	(b)	Discuss the merits and demerits of Notch fall and Sarda type fall.	**07**
Q.5	**(a)**	Discuss Khosla's theory for design of weir on permeable foundation.	**07**
	(b)	Discuss the design criteria for head regulator and cross regulator.	**07**
		OR	
Q.5	**(a)**	Explain Bligh's creep theory. What are its limitations?	**07**
	(b)	An impervious floor of a weir on permeable soil is 20 m long and has sheet piles at both the ends. The u/s pile is 5m deep and the d/s pile is 6m deep. The weir creates a net head of 2.5 m. Neglecting the thickness of the weir floor, calculate the uplift pressure at the inner faces of the pile with the weir floor. Use khosla's theory.	**07**

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