Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER 2013

Subject Code: 170602 **Date: 05/12/2013**

Subject Name: Irrigation Engineering

Time: 10:30 TO 01:00 **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)** Describe various methods of surface irrigation. **07**

(b) Define diversion headwork. Describe the function of each component of diversion head work with a neat diagram. **07**

Q.2 **(a)** Define duty and delta. Derive a relationship between duty and delta for a given base period. Also briefly discuss factors affecting duty. **07**

(b) Define the following terms clearly **07**
(1) Base period (2) Intensity of irrigation (3) Culturable command area (4) Kor period (5) Kor depth (6) Capacity factor (7) Time factor

OR

(b) A field channel has a culturable command area of 2000 hectares. The intensity of irrigation for gram is 30% and for wheat is 50%. Gram has a kor period of 18 days and kor depth of 12 cm, while wheat has a kor period of 15 days and a kor depth of 15 cm. Calculate the discharge of field channel. **07**

Q.3 **(a)** Describe Kennedy's silt theory to design an alluvial channel and compare it with Lacey's theory. **07**

(b) Describe causes and remedial measures of water logging. **07**

OR

Q.3 **(a)** Design a regime channel to carry a discharge of 50 cumecs using Lacey's silt theory. Assume particle size = 0.63 mm **07**

(b) Write short note on **07**
(1) Canal alignment (2) Balancing depth of canal

Q.4 **(a)** Describe the causes of failure of weir on pervious foundation and their remedies. **07**

(b) Describe Khosla's theory elaborating its salient features clearly with flownet. **07**

OR

Q. 4 **(a)** An impervious floor of a weir on permeable soil is 16 m long and has sheet piles at both the ends. The upstream pile is 4m deep and downstream pile is 5 m deep. The weir creates a net head of 2.5 m. Calculate the uplift pressure at the junction of pile with the weir floor at both ends using Khosla's theory. Consider the thickness of floor equal to 0.5 m. **07**

(b) Write short note on **07**
(1) Exit gradient and its importance
(2) Factors governing the design of weirs

Q.5 **(a)** What are the different types of cross-drainage works that are necessary on a canal alignment? State briefly the conditions under which each one is used. **07**

(b) Show by sketch the type of cross drainage work suitable for each of the following cases. **07**

(1)	Drain	Canal
Discharge in cumecs	200	20
Bed level (m)	25.0	30
HFL/ FSL (m)	28.0	31.5

(2)	Drain	Canal
Discharge in cumecs	2	400
Bed level (m)	52.2	48.0
HFL/ FSL (m)	53.2	53.0

OR

Q.5 **(a)** Write short note on **07**
(1) Silt control devices (2) Canal escape

(b) Discuss necessity and location of canal fall. Describe comparative merits and demerits of notch fall and sarda fall. **07**

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