

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER – VII • EXAMINATION – WINTER 2012

Subject code: X 70605

Date: 01/01/2013

Subject Name: Irrigation Water Management

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) Give the breakup of total head into four different components against which the pump in a sprinkler irrigation system has to work and explain each. **07**
(b) Differentiate between water application efficiency and water storage efficiency and give the significance of each. **07**

- Q.2** (a) Give the role of remote sensing in monitoring of irrigated areas. **07**
(b) A stream flowing at the rate of 140 l/s was diverted from a canal and 100 l/s was delivered to the field. Find the conveyance efficiency of the canal. The depth of water penetration in the field varied linearly from 1.8 m at the head end to 1.1 meter at the tail end. Find the distribution efficiency at the field. **07**

OR

- (b) Determine the system capacity for a sprinkler system for maize crop for an area of 15 hectares. Take design moisture use rate of 5mm/day, moisture replaced in soil at each irrigation 6cm., irrigation efficiency 75%, irrigation period 8 days. The irrigation interval is 12 days and the system is operated for 20 hours a day. **07**
- Q.3** (a) Give a comparison of sprinkler and drip irrigation. **07**
(b) Explain how land grading for agricultural purposes is done taking into consideration the following factors: type of soil, rainfall characteristics and irrigation methods. **07**

OR

- Q.3** (a)(i) Describe the maintenance of sprinkler nozzles. (ii) Give the expression for nozzle discharge and the process of calculating nozzle diameter. **07**

- (b) Explain the criteria for fixing furrow size, furrow slope and the stream size in furrow irrigation. **07**

- Q.4** (a) How is friction head loss calculated in drip lateral and explain the nature of energy line in the drip lateral **07**
(b) Explain irrigation interval and irrigation period. Explain how irrigation interval is fixed for a particular crop **07**

OR

- Q.4** (a) (i) Define project efficiency. **07**
(ii) Give the advantage of subsurface drainage in comparison to surface drainage.

- (b) Enlist the repair and maintenance works to be carried out for canals **07**
- Q.5** (a) Explain the effect of salts on the quality of irrigation water and how presence of excessive dissolved salts is harmful for healthy crop growth. **07**
(b) Give the suitability of border irrigation with respect to crops and soils. How the length, slope of the border are fixed and how is the stream size decided. **07**

OR

- Q.5** (a) Discuss how various irrigation efficiency indicators can be used for performance evaluation of canal irrigation system **07**
(b) Discuss the ill effects of water logging. **07**
