Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –III Examination Dec. - 2011

Subject code: 731202 **Date: 08/12/2011**

Subject Name: Water Use 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)** Discuss briefly the factors affecting the choice of the method of irrigation. Discuss in brief the check basin method. **07**

(b) Define and explain consumptive use of water. List the various factors which affect it. **07**

Q.2 **(a)** Compare in a tabular form, furrow, sprinkler and drip irrigation methods. **07**

(b) How will you determine the following losses in sprinkler irrigation system? **07**
(i)Head loss in mainline due to friction.
(ii) Frictional loss in lateral line.
(iii) Head loss in pipe couplings and other fittings.

OR

(b) Discuss the advantages of drip irrigation system over other methods of irrigation. Discuss the hydraulics of flow in the drip irrigation method. **07**

Q.3 **(a)** Discuss soil-water-plant relationship in detail. **07**

(b) Calculate the reservoir capacity required from the following data, if the conveyance losses are 12% and reservoir evaporation and seepage losses are 6%. **07**

Crop	Base Period (days)	Duty at the field (ha/cumec)	Area under the crop (ha)
Wheat	150	1900	9000
Rice	120	800	6000
Sugarcane	320	750	3000
Cotton	210	1500	2500
Other crops	120	600	1500

OR

Q.3 **(a)** Explain the following stages of planning and design of sprinkler system. **07**
(i) Capacity of the system.
(ii) Operating pressure.
(iii) Spacing between sprinklers and laterals.

(b) Define irrigation efficiency and discuss irrigation scheduling. **07**

Q.4 **(a)** How will you decide the following in a drain: **07**
(i) Alignment
(ii) Velocity of flow
(iii) Capacity of drain

	(b)	Determine drain spacing for an area where impermeable bed exists 4.6 m below ground surface. The water-table should be 0.6 m below the ground level. The rate of discharge per unit area of land surface is 0.75 cm per day and coefficient of permeability is 1.26 cm/hour.	**07**
		OR	
Q.4	**(a)**	What is waterlogging? What are the ill-effects of waterlogging? Discuss soil fertility management.	**07**
	(b)	What are the reasons for the formation of saline and alkali soils? How the salt affected soil can be reclaimed?	**07**
Q.5	**(a)**	Explain modernization of existing irrigation projects.	**07**
	(b)	Discuss operation and management of irrigation projects.	**07**
		OR	
Q.5	**(a)**	Describe automation and control and regulation of canals.	**07**
	(b)	Discuss command area development organizations and Their role in water management.	**07**

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