Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 731202 **Date: 26/12/2012**

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)** 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.

Q.2 **(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) Discuss the hydraulics of flow in the drip irrigation method. **07**

OR

(b) Explain in detail the component parts of drip irrigation system. **07**

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

(b) What is crop planning? What are the various crop patterns? Discuss the methods of crop improvement. **07**

OR

Q.3 **(a)** Explain the different methods used for determination of consumptive use of water. **07**

(b) Calculate the reservoir capacity, if the conveyance losses are 18% and reservoir evaporation and seepage losses are 10%. **07**

Crop	Base Period (days)	Duty at the field (ha/cumec)	Area under the crop (ha)
Wheat	120	1800	8000
Rice	115	850	4000
Sugarcane	310	750	2000
Cotton	200	1500	1000
Other crops	110	600	800

Q.4	**(a)**	What is waterlogging? What are the ill-effects of waterlogging?	**07**
	(b)	What types of works are entailed in the maintenance of drains? Describe them briefly.	**07**

OR

Q.4	**(a)**	How will you decide the following in a drain: (i) Alignment (ii) Longitudinal section (iii) Water surface slope	**07**
	(b)	Determine the size of the tile drain for a drainage area of 7 hectares and drainage coefficient of 1.25 cm. The longitudinal gradient of the drain is 0.2% and the rugosity coefficient of the material of drain is 0.016.	**07**
Q.5	**(a)**	Write short note on “water use management.”	**07**
	(b)	Explain modernization of existing irrigation projects.	**07**

OR

Q.5	**(a)**	Discuss command area development.	**07**
	(b)	Describe automation and control and regulation of canals.	**07**

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