Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: X60603 **Date: 09-12-2013**

Subject Name: Irrigation Engineering

Time: 02.30 pm - 05.00 pm **Total Marks: 70**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Discuss briefly the benefits of irrigation	**07**
	(b)	What are the types of irrigation systems ? Discuss each of these systems briefly.	**07**
Q.2	**(a)**	Discuss briefly the factors affecting the choice of the irrigation methods.	**07**
	(b)	Find the field capacity of a soil for the following data : (I) Depth of root zone = 2 meter (ii) Existing water content = 5 % (iii) Dry density of soil = 1500 kg/cubic meter (iv) Water applied to soil = 600 cubic meter (v) Water lost due to evaporation and deep percolation = 10 % (vi) Area of land irrigated = 900 square meter.	**07**
		OR	
	(b)	A loam soil has field capacity 25 % and permanent wilting percentage 10 %.The dry unit weight of soil is 14.72 kN/cubic meter. If the depth of the root zone is 0.75 meter, determine the storage capacity of the soil. Irrigation water is applied when moisture content drops to 14 %. If water application efficiency is 75 % , determine the water depth required to be applied in the field.	**07**
Q.3	**(a)**	Explain how soil properties affect the irrigation requirement.	**07**
	(b)	Describe with the help of sketch various forms of soil moisture. Which of these soil moistures is mainly available for utilization by the plants ?	**07**
		OR	
Q.3	**(a)**	Distinguish between (I) ridge canal and contour canal. (ii) productive and protective canal.	**07**
	(b)	Discuss in detail the various causes of losses of water in channels.	**07**
Q.4	**(a)**	Explain the terms ‘duty’ and ‘delta’. Derive a relationship between the two for a given base period.	**07**
	(b)	What is consumptive use of water? Describe any two methods for determining the consumptive use of water.	**07**
		OR	
Q.4	**(a)**	Determine the dimensions of the irrigation canal for the following data : (B/D) ratio = 3.7 ; Rugosity coefficient N = 0.0225 ; critical velocity ratio m = 1.0 ; and bed slope S = (1/4000). Side slope of the channel is 0.5 horizontal to 1 vertical. Also determine the discharge which will be flowing in the channel.	**07**
	(b)	Discuss the drawbacks of kennedy’s theory.	**07**

Q.5	**(a)**	Discuss the various measures which may be taken to prevent water logging as well as to relieve the land already waterlogged.	**07**
	(b)	Write a note on economics of channel linning.	**07**

OR

Q.5	**(a)**	What is level crossing ?	**07**
	(b)	What is a barrage ? how does a barrage differ from a weir.	**07**

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