Seat No.:	Enrolment No.

Subject code: 711701N

**Subject Name: Principles of Water Treatment** 

## GUJARAT TECHNOLOGICAL UNIVERSITY

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

Date: 08-01-2013

		2.30 pm – 05.00 pm Total Marks: 70 tions:	0
	1. 2.	Attempt all questions.  Make suitable assumptions wherever necessary.  Figures to the right indicate full marks.	
Q.1	(a)	Describe how would you arrive at the total quantity of water to be supplied to a metropolitan area.	07
	<b>(b)</b>	What is meant by term population? What are the various methods which are adopted to estimate population of each successive future decade?	07
Q.2	(a)	The following data have been noted from the census department. Predict the population for year 2031 and 2041 by any two methods.  Year 1971 1981 1991 2001 2011  Population 16000 24000 30500 36000 41000	07
	<b>(b)</b>	Discuss sources and health effects of (i) Hardness (ii) Arsenic (iii) cadmium  OR	07
	<b>(b)</b>	Draw the flow chart for the water treatment processes. Discuss the function of each unit in brief.	07
Q.3	(a)	Define MPN. Why they are considered as indicator organisms? Are they pathogenic? Explain the precautions to be taken for MPN test. One sample out of ten samples of 10 ml each shows positive result, find MPN.	07
	<b>(b)</b>	Discuss quality criteria of water used for fish culture and for industries  OR	07
Q.3	(a)	Write note on mechanical rapid mixing and slow mixing devices.	07
	<b>(b)</b>	Design clarifloculator to treat 5 mld of raw water.	07
Q.4	(a)	Distinguish between slow sand and rapid sand filters.	07
	<b>(b)</b>	Design a rapid sand filter to cater population of 500000.	07
Q.4	(a)	Discuss in detail various filtration mechanisms.	07
Q.4	<b>(b)</b>	Describe with a neat sketch the working of a pressure filter. What are the relative advantages and disadvantages of this type over those of gravity filters.	07
Q.5	(a)	What is meant by disinfection in treating public water supply? What is its importance? What are the chemicals which are used as disinfectants and	P.T.O 07

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what are their comparative merits and demerits?

of water treatment processes.

(b) Explain mechanisms of disinfection in detail.

OR

Q.5 (a) Write short note on water aeration.

(b) What do you mean by adsorption? Discuss in detail its application in field 07

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