Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013

Subject code: 731201 **Date: 26-11-2013**

Subject Name: Water Supply and Drainage

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)** What are the factors which govern the final selection of the source for water supply to a city? **07**

(b) Explain infiltration wells as a source of water supply with help of neat sketch. **07**

Q.2 **(a)** Draw flow diagram of water supply scheme and explain the necessity of water supply **07**

(b) Write historical background of water supply in brief. **07**

OR

(b) Explain under what circumstances pumps are required for the water supply. **07**

Q.3 **(a)** Describe various types of pumps. What are the advantages and disadvantages of centrifugal pumps? **07**

(b) A city with a population of 1.5 million has a continuous water supply. The average demand of the town is 250 litres/capita/day. The water is supplied to the city by direct pumping. The total supply of 250 litres is supplied as under : **07**

Time	Litres
(i) From 5 AM to 11 AM	85
(ii) From 11 AM to 3 PM	50
(iii)From 3 PM to 9 PM	80
(iv)From 9 PM to 12 Mid night	25
(v) From 12 Mid night to 5 AM	10

Water is supplied from the treatment plant at a uniform rate of 12.5 million litres per hour, for all the 24 hours to the city. Determine the capacity of the reservoir required for distribution of water.

OR

Q.3 **(a)** Explain how the water supply project is prepared and project report is written. **07**

(b) State what factors mainly affect the quantity of storm sewage. **07**

Q.4 **(a)** Explain how the runoff of storm sewage is determined by the rational method. **07**

(b) The catchment area of a city is 300 hectares. The types of surface on which the rain fall occurred is given as follows : **07**

Types of surface	% Area	Runoff coefficient
Roofs	20	0.90
Pavement and yards	15	0.80
Lawns and gardens	30	0.15
Macadamised roads	20	0.40
Vacant plots	15	0.10

Calculate the impervious factor. If the maximum intensity of rainfall is 40 mm/hour, calculate the quantity of storm water which will reach sewer lines.

OR

Q.4	**(a)**	Write various empirical formulae to determine storm sewage and explain time of concentration.	**07**
	(b)	Write short note on hydraulically equivalent section of storm sewer.	**07**
Q.5	**(a)**	Describe analysis of pipe network by Hardy cross method.	**07**
	(b)	Explain how the flood is predicted for the urban storm drainage.	**07**

OR

Q.5	**(a)**	Write points to be considered for selecting the site for the pumps regarding to water supply.	**07**
	(b)	Describe the design procedure of underground storage reservoir.	**07**

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