Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – SUMMER 2022

Subject Code:3141312 Date:04-07-2022

Subject Name:Municipal Engineering

Time:10:30 AM TO 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What is the importance of Water supply scheme?	**03**
	(b)	Draw a neat flow diagram of water supply scheme.	**04**
	(c)	Explain river as a source of water considering the quality and quantity of water.	**07**
Q.2	**(a)**	What is design period? State the design periods for any three components of water supply scheme.	**03**
	(b)	A water supply scheme has to design for a city having a population of 100000. Estimate the important kinds of drafts (demands) which may be required to be recorded for an average water consumption of 250 lpcd. Also record the required capacities of the major components of the proposed water works system.	**04**
	(c)	A town having a population of 60,000 is supplied with a per capita water supply of 180 litres per day. A separate sewer from this town enters a pumping station through a low level sewer at R.L. 120.00 m. This sewage is to be pumped to a high level sewer at R.L. 129.00 m. Assuming that 80% of water reaches the sewer, determine a) size of sump well, b) BHP of pump motor required and c) size of rising main, if the length is 120 m. (Peak flow =3 times the average flow, Velocity of flow in rising mains = 1 m/s, Min. time of pumps running continuously = 15 min, Head losses in bends = 0.4 m, Efficiency of pump =65% and Efficiency of Driving Unit = 75%)	**07**
		OR	
	(c)	Prepare a list of different types of valves used in water supply and explain any two in brief with neat sketch.	**07**
Q.3	**(a)**	Write a short note on ideal population growth curve.	**03**
	(b)	Differentiate between Gravity system & Pressurized system of water supply.	**04**
	(c)	Enlist the types of layout for water distribution systems and explain any two in detail.	**07**
		OR	
Q.3	**(a)**	Describe a river intake with the help of a neat sketch.	**03**
	(b)	Draw neat sketches and describe the following joints: (i) Expansion joint & (ii) Flanged joint	**04**

	(c)	Under what circumstances pumps are required? What are the main classifications of pumps?	**07**
Q.4	**(a)**	Define the term: (i) Time of Concentration, (ii) Inlet Time & (iii) Time of Travel	**03**
	(b)	What factors affect the quantity of storm water flow?	**04**
	(c)	Determine design discharge for a combined system serving population of 75000 with rate of water supply of 150 lpcd. The catchment area is 150 x 10^4 m^2 and the average coefficient of runoff is 0.70. The time of concentration for the design rainfall is 35 min and the relation between intensity of rainfall and duration is I = 1000 / (t+20).	**07**
		OR	
Q.4	**(a)**	What do you understand by the terms 'self-cleansing velocity' and 'non-scouring velocity' in sewers?	**03**
	(b)	Write a note on laying of sewers.	**04**
	(c)	How does the sewage flow vary from hour to hour, day to day and season to season in what way does this affect the design of sewage system?	**07**
Q.5	**(a)**	Explain the hydrostatic test for laying of new sewer pipelines.	**03**
	(b)	What are the aims and objectives of sewage disposal?	**04**
	(c)	What are the differences between drains and sewers? What are the requirements of an ideal drain section?	**07**
		OR	
Q.5	**(a)**	What are the requirements of a good trap?	**03**
	(b)	What should be the characteristics of materials to be used for sewer construction?	**04**
	(c)	Describe the conservancy and water-carriage system of sanitation. In new developing town which method you will prefer and why?	**07**

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