Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2024

Subject Code:3150616 Date:23-05-2024

Subject Name:Pipeline Engineering

Time:02:30 PM TO 05:00 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)**	Find the head loss due to friction in a rising main using following data: 1. Length of rising main= 1200m 2. Diameter of the pipe= 0.30m 3. Discharge= 1.8 m^3/min 4. Coefficient of friction= 0.0075.	**03**
	(b)	Define corrosion. Enlist different factors contributing to pipe corrosion. Also enlist the methods used for prevention of corrosion.	**04**
	(c)	Explain different type of systems used for distribution of water	**07**
Q.2	**(a)**	Differentiate between major and minor losses occurring in the pipes.	**03**
	(b)	A pipe of 500 mm outer diameter is subjected to a working pressure of 18 kg/cm^2. The allowable stress for the pipe is 200 kg/cm^2. The corrosion allowance to be taken is 1.8 mm. Find the thickness of the pipe with and without corrosion allowance.	**04**
	(c)	Derive Darcy-Weisbach equation for finding head loss.	**07**
		OR	
	(c)	Explain different types of welding techniques used for pipe joints.	**07**
Q.3	**(a)**	What is rising main? Find out the most economical diameter of the rising main to carry a discharge of 0.5 cumecs.	**03**
	(b)	Write a short note of water audit.	**04**
	(c)	Explain different methods used for rehabilitation of pipelines.	**07**
		OR	
Q.3	**(a)**	What is thrust block? Write the steps to be followed for the design of thrust block.	**03**
	(b)	Explain different types of bends used in a pipe network.	**04**
	(c)	Explain different leak detection techniques used for pipelines.	**07**
Q.4	**(a)**	Find the diameter of the circular sharp edge orifice which is to be provided in the side of the tank. The head of the water over the orifice is 9 m. The required discharge is 0.03 m^3/s. Take Cd=0.62.	**03**
	(b)	Enlist different types of valves used in distribution network. Explain any two of them in detail.	**04**
	(c)	Explain step by step, the procedure used for laying the pipes for water distribution.	**07**
		OR	
Q.4	**(a)**	Why flow meter is required in the pipe network? Enlist different types of flow meters.	**03**

	(b)	Explain different type of non destructive testing methods used for testing weld joint.	**04**
	(c)	State the advantages and disadvantages of cast iron and concrete pipes.	**07**
Q.5	**(a)**	Differentiate between centrifugal and displacement pump.	**03**
	(b)	Explain different methods used for analysis of the pipe network.	**04**
	(c)	Explain different remedial measures used for control of water hammer.	**07**

OR

Q.5	**(a)**	A city with a population of 75000 is to be supplied water at the rate of 210 lpcd, what will the quantity of the water required to meet the daily water demand of the city. Take peak factor as 1.5.	**03**
	(b)	What is water hammer? How surge pressure is calculated?	**04**
	(c)	Explain mass curve method used for finding the capacity of ESR.	**07**

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