

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3160611****Date:22-05-2026****Subject Name:Environmental 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) Write down the empirical formula of fire demand. **03**
- (b) For a city population record for past decades were found as follows. **04**
Estimate 1) saturation population for this city. 2) Expected population in 2030

Year	Population
1990	11000
2000	16000
2010	22500

- (c) Explain the zones of pollution of a polluted stream. **07**
- Q.2** (a) Explain the source of the following primary pollutant **03**
1) Carbon monoxide
2) Particulate matter
3) Sulphur dioxide
- (b) A Sewer has a diameter of 300 mm and slope in 1 in 400. While running full it has mean velocity of 0.7 m/s. If both the diameter and slope are 600 mm and 1 in 200. What will be the changed mean velocity when running half full? Assume suitable data if necessary. **04**
- (c) Design a plain sedimentation tank for a water supply scheme having capacity 10 MLD having Detention time 5 hours ,Velocity of flow 0.20 m/min ,Water depth 3.5 m and Free board 0.5 m . Assume suitable data if necessary. **07**

OR

- (c) Explain comparison of Slow sand filter and Rapid sand filter. **07**
- Q.3** (a) Define the terms **03**
1) BOD
2) Sewerage system
3) Trap
- (b) An industrial waste water enters a stream having a BOD concentration of 10 mg/l and flow of 20 m³/s. if the flow of waste water is 1.5 m³/s and its BOD concentration is 250 mg/l then the BOD concentration in the stream at a point of confluence of wastewater with the stream will be. Assume suitable data if necessary **04**
- (c) Explain trickling filter with sketch. **07**

OR

- Q.3** (a) Define the terms **03**
1) COD
2) Sullage
3) Anti-siphonage pipe

	(b)	A sample of sewage is estimated to have a 5 day 20 °C BOD of 250 mg/l .if the test temperature be 30°C in how many days will be the same value of BOD be obtained?	04
	(c)	Explain Activated sludge process with sketch	07
Q.4	(a)	Write down the Assumption of sewer design.	03
	(b)	Explain septic tank.	04
	(c)	Explain methods of water distribution system.	07
		OR	
Q.4	(a)	Define the terms Self cleansing velocity and Non scouring velocity.	03
	(b)	Explain Soak pits.	04
	(c)	Explain different layout of distribution system.	07
Q.5	(a)	Enlist Sewer Appurtenances.	03
	(b)	Explain types of chlorination.	04
	(c)	Explain sanitary land filling? Describe the different factors to be considered for the site selection of sanitary land filling.	07
		OR	
Q.5	(a)	Enlist the classification of Settling tanks.	03
	(b)	Explain zeolite process.	04
	(c)	Design a primary settling tank of rectangular shape for a town having population of 40000 with water supply of 135 l/c/day. Assume 80 % of water supplied to the town is converted to wastewater and detention period 2 hr, SOR is 30 m ³ /m ² /day take L/B=4. Assume suitable data if necessary.	07
