Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021

Subject Code:3160611 Date:26/11/2021

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)**	Explain the physical characteristics of water	**03**
	(b)	Define BOD. Give the significance of BOD test for wastewater.	**04**
	(c)	Draw a neat flow chart of a conventional water treatment plant. Enlist the function of each unit.	**07**
Q.2	**(a)**	What is design period? Explain the factors affecting the selection of the design period.	**03**
	(b)	Find $BOD_{(5,20)}$ of a wastewater sample, if $BOD_{(3,27)}$ of the sample is 220 mg/lit. Take k_D value at 20° C as 0.1 day^{-1}	**04**
	(c)	Explain the factors affecting the self purification capacity of the river.	**07**
		OR	
	(c)	Explain the zones of pollution of a polluted stream	**07**
Q.3	**(a)**	Differentiate between plain sedimentation and sedimentation aided with coagulation	**03**
	(b)	Differentiate between suspended growth and attached growth process.	**04**
	(c)	Design a primary sedimentation for treating 8 MLD of water	**07**
		OR	
Q.3	**(a)**	Why back washing is required in a rapid sand filter? What is the commonly used rate of back washing?	**03**
	(b)	Explain with neat sketch, working of a flash mixer.	**04**
	(c)	Explain different types of traps used in house drainage system.	**07**
Q.4	**(a)**	Explain how you will find the dry weather flow required for design of sewerage system.	**03**
	(b)	Differentiate between activated sludge unit and trickling filter.	**04**
	(c)	Calculate the diameter and discharge of a circular sewer laid at a slope of 1 in 450 when it is running half full, and with a velocity of 1.0 m/s. Take Manning constant as 0.013.	**07**
		OR	
Q.4	**(a)**	Draw a house drainage plan for a 3BHK detached bungalow.	**03**
	(b)	Enlist different equipments that can be used to control suspended particulate matter. Explain working of any one of them in detail.	**04**
	(c)	A single stage trickling filter is required to be designed to treat 3 MLD of sewage with BOD of 250 mg/L. Assume organic loading rate as 11000 kg/ha-m/day and recirculation ratio as 1.0. What will be the BOD of the effluent?	**07**
Q.5	**(a)**	Enlist sources of noise pollution.	**03**
	(b)	Define EIA. Draw a flow chart showing different steps involved in the EIA process.	**04**
	(c)	Explain sanitary land filling used for solid waste disposal.	**07**

OR

Q.5	**(a)**	Find the head loss due to friction in a rising main using following data: 1. Length of rising main= 750m 2. Diameter of the pipe= 0.25m 3. discharge= 1.5 m^3/min 4. Coefficient of friction= 0.0075.	**03**
	(b)	Why EIA is required for achieving the goal of sustainable development.	**04**
	(c)	Explain the effect of air pollution on human beings	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160611 Date:03/06/2022

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)**	What is the necessity of water supply scheme? Draw a complete flow diagram of water treatment plant.	**03**
	(b)	Discuss various control measures for water borne diseases.	**04**
	(c)	Enlist different physical and chemical characteristics of water and discuss their environmental significance.	**07**
Q.2	**(a)**	Explain population forecasting by geometrical increase method.	**03**
	(b)	Find average of pH 2 and pH 6. Calculate how much acidic is pH 2 compared to pH 6.	**04**
	(c)	What is solid waste management? State the composition and characteristics of the municipal solid waste.	**07**
		OR	
	(c)	What is an intake structure? Sketch and explain construction and working of a river intake.	**07**
Q.3	**(a)**	What causes alkalinity in water.	**03**
	(b)	Give advantages and disadvantages of RCC pipe.	**04**
	(c)	Give comparison between rapid sand filter and slow sand filter.	**07**
		OR	
Q.3	**(a)**	Explain reflux valve with neat sketch.	**03**
	(b)	Write short note on Grid iron system of water distribution network.	**04**
	(c)	Design a sedimentation tank for a water works, which supplies $1.4x10^6$ liter/day water to the town. The sedimentation period is 5 hours, the velocity of flow is 12 cm/minute, depth of water in the tank is 4.0m. Assuming an allowance for sludge is to be made as 80cm.	**07**
Q.4	**(a)**	Differentiate between aerobic and anaerobic decomposition of wastewater.	**03**
	(b)	What do you understand by sedimentation with coagulation?	**04**
	(c)	What are various methods of disinfection? What are the chemicals used as disinfectants?	**07**
		OR	
Q.4	**(a)**	What is dB? Explain the effects of noise pollution.	**03**
	(b)	Discuss the different methods of sewage disposal.	**04**
	(c)	Determine BOD_8 at 15^0 C if BOD_5 at 20^0C is 150 mg/l. $k_{D(20)}$ = 0.23.	**07**

Q.5	**(a)**	Differentiate between BOD and COD.	**03**
	(b)	Write a short note on septic tank.	**04**
	(c)	Explain DO sag curve with sketch.	**07**
		OR	
Q.5	**(a)**	Explain effects of air pollution on human health.	**03**
	(b)	Write a short note on composting.	**04**
	(c)	Sketch and explain construction and working of trickling filter.	**07**

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