Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2171303   **Date: 19/11/2018**

Subject Name: Industrial Water Pollution & Control

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.**

Q.1	**(a)**	Write down various sources & sinks for Dissolved Oxygen (DO) in river.	**03**
	(b)	List various benefits to industry for pollution abatement & explain intangible benefits with examples.	**04**
	(c)	Write a short note on "Stratification of lake" with neat figure.	**07**

Q.2	**(a)**	Under which scenario authority shall allow industry for on land disposal?	**03**
	(b)	Explain various challenges of Common Effluent Treatment Plants (CETPs).	**04**
	(c)	A municipal wastewater treatment plant discharges 1.5 m^3/s of treated effluent having ultimate BOD of 80 mg/L & Dissolved oxygen of 2.5 mg/L into Green river. The river has a flow of 9.1 m^3/s, ultimate BOD of 7 mg/L & dissolved oxygen of 8.5 mg/L. Assume a complete & instantaneous mixing. At 20 ˚C saturated DO concentration of green river is 9.1 mg/L. Estimate the following	**07**

        1. Initial DO deficit

        2. If the river has a constant velocity of 0.4 m/s, Estimate BOD of the stream at distance 20 kms down stream. (Assume $k_d = 0.2$ day^{-1})

OR

	(c)	A degradable material with the first order decay constant value of 2.5 year^{-1} enters a lake with a volume of 4000 x 10^6 m^3. The inflow quantity is 1500 x 10^6 m^3/year with a concentration of degradable material 30 mg/L. Estimate a concentration in the lake at steady state & at the end of half years. Also determine its effective residence time at the steady state. Assume that initial concentration of degradable material in lake is 1.0 mg/L.	**07**

Q.3	**(a)**	Explain the need of Equalization in wastewater treatment.	**03**
	(b)	Draw an Effluent Treatment Plant (ETP) flow diagram for treatment of Starch effluent.	**04**
	(c)	Name major methods of neutralization for both acid and alkaline wastes & explain any one in detail.	**07**

OR

Q.3	**(a)**	Explain the need of Proportioning in wastewater treatment.	**03**
	(b)	Draw an Effluent Treatment Plant (ETP) flow diagram for treatment of Fertilizer industry.	**04**
	(c)	What is Strength Reduction? Enlist the different techniques of Strength Reduction & explain strength reduction by equipment modification with appropriate examples.	**07**

Q.4 **(a)** Enlist sources & effects of oil Pollution. **03**

(b) Give difference between standards & criteria. **04**

(c) Discuss " Why an authority is more concerned about pollution caused by an industry" **07**

OR

Q.4 **(a)** List various methods for treatment of Strong industrial wastewaters. **03**

(b) Give difference between Effluent standards & stream standards & also write India has adopted which type of standards. **04**

(c) Write a short note on "Basic water quality parameters required for boiler feed water and cooling water." **07**

Q.5 **(a)** Explain importance to draw water balance diagram for any industry. **03**

(b) Write down objectives of Common Effluent treatment Plant(CETP). **04**

(c) Draw butter manufacturing process diagram, indicate wastewater generation sources in same diagram & explain reuse & recycle potential of wastewater. **07**

OR

Q.5 **(a)** Discuss points to be considered while select "Sewer" as ultimate point of disposal. **03**

(b) Explain the method for determination of "Euphotic Zone "in lake. **04**

(c) Draw manufacturing process diagram of Textile industry, identify various sources of wastewater generation in the same & suggest appropriate treatment flow diagram to achieve effluent standards. **07**

****