Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code: 141304 **Date:06/01/2016**

Subject Name: Water Pollution & Control

Time: 02:30pm to 05:00pm **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)**	Explain sources and effects of ground water pollution.	**07**
	(b)	Explain significance and classification of water quality parameters. Describe any two in details.	**07**
Q.2	**(a)**	Define unit operations and unit processes. Explain Classification of various levels of treatments for water and wastewater.	**07**
	(b)	Enlist various coagulants. Explain chemistry of coagulation when Alum is used as coagulant.	**07**
		OR	
	(b)	Design a flash mixer for a flow of 200 m³/h assuming following data : (1) Detention time = 45 S (2) G = 600/S (3) Temperature of water = 20^0 C (4) Dynamic Viscosity = 1.139×10^{-3} N. S/m^2	**07**
Q.3	**(a)**	Design a plain sedimentation basin to treat 3.6 MLD of water so as to settle particles of grain size 0.002 cm or more with specific gravity of 2.65 at 26^0 C temperature. [1 cm/sec settling velocity corresponds to Surface Loading of 8,64000 L /day per m^2.] Displacement velocity of flow = 12 cm/min. Assume suitable data where necessary.	**07**
	(b)	Explain construction and working of Slow Sand Filter with neat sketch.	**07**
		OR	
Q.3	**(a)**	Explain significance of softening process in water treatment. Explain any one process to remove permanent hardness from water.	**07**
	(b)	Explain in brief the methods of chlorine application in disinfection process. What are the various factors that affect pathogen removal efficiency of chlorine?	**07**
Q.4	**(a)**	Draw a neat sketch of wastewater treatment plant and state functions of each unit.	**07**
	(b)	What is the function of screens? Explain classification of screens, and also enlist important design parameters for screen design.	**07**
		OR	
Q.4	**(a)**	Explain various types and important design parameters for grit chamber in wastewater treatment.	**07**
	(b)	Differentiate between Attached growth process and suspended growth process in biological treatment for wastewater. Describe Activated sludge process in brief.	**07**

Q.5	**(a)**	Explain construction of trickling filter in short. Differentiate between high rate trickling filter and standard rate trickling filter.	**07**
	(b)	What are the measures to prevent and control thermal water pollution?	**07**

OR

Q.5	**(a)**	What are the reasons and consequences of oil – pollution?	**07**
	(b)	Following are results of a treated wastewater effluent at final outlet of treatment plant. Can this effluent be discharged in a river? Justify your answer for each parameter and write final conclusion. (i) Suspended Solids = 120 mg/l (ii) pH value = 6 (iii) Oil = 14 mg/l (iv) BOD = 60 mg/l (v) COD = 250 mg/l (vi) Ammonic Nitrogen= 65 mg/l	**07**

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