Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 173504 **Date:07/12/2015**

Subject Name: Liquid Effluent Control - II

Time: 10:30am to 1:00pm **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)**	Briefly Explain the different sources of waste coming out from a Pulp & paper Plant.	**07**
	(b)	**1)** A treatment unit is 1.5m wide and 20m long and has a waste water depth of 2m in it. If the waste water flow in the tank is $0.5m^3/s$. Calculate the detention time.	**03**
		2) Assuming the hydraulic loading rate $25m^3/m^2$ day. Determine the surface area and diameter of the circular treatment basin having the flow of 0.2 MLD. Assume Flow rate Q = 0.5 x 103 m^3/day.	**04**
Q.2	**(a)**	Discuss the harmful effects of effluents discharged without treating from Pesticide Plant.	**07**
	(b)	Find the number of tubes in a tube settler module of a square cross section with following data: 1) Average output required from the settler = 6 MLD 2) Loss of Water in desludging = 2% of output. 3) Cross Sectional Square area of tube = 50mm x 50mm 4) Length of tube = 1m 5) Angle of inclination = 60º 6) Kinematic Viscosity = 1.01×10^{-6} m^2/sec 7) Critical Settling Velocity = 120 m/day	**07**
		OR	
	(b)	Explain the Different sources of waste coming from dairy industry along with its effects on receiving stream.	**07**
Q.3	**(a)**	Assuming Suitable design criteria, design a screen chamber to treat a maximum flow of 13 MLD of domestic waste water in each channel.	**07**
	(b)	List out the different characteristic of Agriculture waste along with its treatment.	**07**
		OR	
Q.3	**(a)**	Discuss the effects of untreated waste discharged from Fertilizer plant along with its treatment flow diagram.	**07**
	(b)	Define the Following: **1)** Detention Time **2)** Flow through velocity **3)** Surface over flow rate **4)** Weir overflow rate	**07**
Q.4	**(a)**	Discuss the treatment process for the effluent coming out form Dyes & Pigment industry along with a neat sketch.	**07**
	(b)	If 5 MLD flow of waste water has 250 mg/l BOD and Volumetric loading rate is 2.8 kg BOD/m^3 day. Calculate the volume of the tank.	**07**
		OR	
Q.4	**(a)**	Along with a neat flow diagram of manufacturing process briefly explain the different sources of waste coming from Textile Industry.	**07**
	(b)	Find the terminal settling velocity of spherical particle with diameter 0.05mm	**07**

of specific gravity 2.65 settling through water having kinematic viscosity 1.004 x 10^{-6} m^2/sec

Q.5 **(a)** Briefly Explain the treatment of effluent coming from Pharmaceutical plant. **07**

(b) A settling tank is designed to remove spherical discrete particle 0.4mm diameter and specific gravity 1.01 from water at 20 ºC. Assume ideal settling conditions. Determine the removal of discrete particle of 0.2 mm diameter with specific gravity 1.01 by this tank. Assume kinematic Viscosity = 1.01 x 10^{-6} m^2/sec. **07**

OR

Q.5 **(a)** Explain the Different sources of waste coming from dairy industry along with its effects on receiving stream. **07**

(b) Design circular radial flow sedimentation tank for a town with a projected population of 50,000. Assume average wastewater flow of 350 Liter. Per capita per day. Design for two hours detention time at 120% of average flow. Determine tank depth and diameter to produce an overflow rate of 35 m^3/m^2 day. Assume standard tank dimensions and check the design for WOR and horizontal velocity. **07**

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