SEAT	No

[A-32]

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Sardar Patel University

M.Sc. Integrated Biotechnology IGBT-PS10CIGES3 (Environmental Engineering) Friday, 13th April 2018 10:00 A.M. to 01:00 P.M.

Total marks: 70

Note:						
 Figures to the rights indicate marks Draw neat and labeled diagram wherever necessary 						
Q.1		Mark the right answer of following que	stions.	[08]		
¥	1.	Total concentration of organic and ammonia nitrogen concentration in municipal				
		wastewater is typically in the range of				
		a) 10 to 20 mg/L		25 to 45 mg/L		
		c) 45 to 55 mg/L	_	55 to 65 mg/L		
	2.	nd widely distributed of all denitrifers.				
		a) Pseudomonas	b)	Nitrobacter		
		c) Nitrosomonas	d)	All of above		
	3.	Synthetic ion-exchange resins used for wa	astewater	treatment are manufactured by a process		
		in which are copolymerized.				
		a) Styrene	b)	Divinylbenzene		
		c) Agarose	d)	Both (a) and (b)		
	4.	In advanced oxidation processes	,,_, <u>_</u> ,	technologies used to produce		
		hydroxyl radicals.				
		a) Ozone/UV	b)	Ozone/H ₂ O ₂		
		c) H ₂ O ₂ /UV	d)	All of these		
	5. Nanofiltration has efficiency to reject constituents as small as					
		a) . 0.01 um	b)	0.001um		
		c) 0.0001 um	d)	0.1 um		
	6. In adsorption, activated carbon preparation char is exposed to					
		a) exposing to steam and CO ₂	b)	exposing to sulphur gas		
		c) exposing to neon gas	d)	All of above		
	7.	In Gas chemical feed systemg	ases are u	ised.		
		a) Ammonia	b)	Chlorine		
		c) Oxygen	d)	All of above		
	8.	In which sludge treatment process, the sl	udge is tr	eated with chemicals.		
		a) Dewatering	b)	Thickening		
		c) Conditioning	d)	Drying		
		•		PTO		

Answer the following questions. (ANY SEVEN OUT OF NINE) Q.2[14]What is the significance of calculation of biomass yield and O2 requirements at ETP? Which are the environmental factors that can influence aerobic biological oxidation? 2. Write importance of grit removal for effluent treatment process. What are the sources of electron donors in biological denitrification process? What are the advantages of sludge thickening process? 5. Which bacteria are involved in biological nitrification? Explain their role with specific 6. equation. What are the applications of membrane technologies? 7. Which steps are required for upgradation of ETP? 8. Write the role of different chemicals in dechlorination process. 9. A. What are the advantages of biological phosphorus removal? Write a detailed note on [06] Q.3 biological phosphorus removal by PAOs. Illustrate rate of utilization of soluble substrate, biomass growth, calculation of total [06] В. volatile suspended solids and observed yield. B. At Surat municipal corporation domestic wastewater treatment plant, activated sludge [06] process has 1050m³ influent flow rate and having nbVSS concentration 40gVSS/m³. The reactor volume and reactor bsCOD concentrations are 550m³ & 80g bsCOD/m³ respectively. The biomass concentration is 850gVSS/m^3 . The f_d and K_d are 0.10, k is 6mg BOD/mgVSS, Ksis 50mg BOD/I and Y is 0.4mgVSS/mgBOD. Find out observed yield, net biomass and write your comments on plant performance. A. Write short notes on: 1) Advantages and disadvantages of RO & NF Q.4 [06]2) Electrodialysis B. What are the purposes of physical unit processes? Give an account on role of [06] different screens in wastewater treatment. Outline the fundamentals of chemical coagulation treatment process. [06] A. What is the necessity of MEE? Explain components, process and feed arrangement Q.5 [06] of MEE. B. Enlist different types of depth filters. Describe process of any four depth filters in [06] detail. OR B. Which points should be consider before application of chlorine? Write a note on [06] disinfection process with chlorine compounds. A. Why dewatering is obligatory in ETP? Explain different dewatering processes of Q.6[06]sludge with their pros and cons. B. Differentiate convection and conduction with respect to sludge drying. Write a note [06] on sludge heat drying processes. OR B. Write short notes on: 1) Flow equalization [06]2) Chemical neutralization