A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 59917

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Chemical Engineering

15UCH917- WASTE WATER TREATMENT

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Clean water act was amended in_____ CO1- R

   (a) 1972 (b) 1974 (c) 1985 (d) 1976

2. Water quality act was amended in_____. CO1- R

   (a) 1972 (b) 1987 (c) 1985 (d) 1976

3. Air stripping of waste water is done by_____. CO2- R

   (a) Batch reactor (b) PFR

   (c) Complete mix reactor (d) Fluidized bed reactor

4. Example for chemical unit process. CO2- R

   (a) Filtration (b) Gas transfer (c) Mixing (d) Oxidation

5. When Chlorine is added to wastewater, the TDS of the effluent is ____ CO3- R

   (a) Decrease (b) Increase (c) Stable (d) None of these

6. Neutralization involves addition of ____ substances with the waste. CO3- R

   (a) Hydraulic (b) Chemical (c) Physical (d) Biological

7. In rotating biological contractors, what percent of corrugated plastic discs are submerged? CO4- R

   (a) 20 (b) 50 (c) 80 (d) 40

8. Methane is formed due to the reduction of CO4- R

(a) Nitrates (b) Sulfates (c) Carbon dioxide (d) Organic acids

9. Pore size Micro-filtration membrane ranges from_____. CO5- R

(a) 0.1- 5µm (b) 0.1- 0.01µm (c) 0.001- 0.01µm (d) 0.0001- 0.001µm

10. Which of the following factors are considered in ultrafiltration? CO5- R

(a) Size (b) Color (c) Taste (d) Smell

PART – B (5 x 2= 10 Marks)

11. Name two inorganic impurities present in sewage. CO1- R

12. Define material mass balance principle. CO2- U

13. Write Short notes on stabilization. CO3- U

14. Define biomass yield. CO4-U

15. Define Nano-filtration. CO5- U

PART – C (5 x 16= 80 Marks)

16. (a) Write a detail account about the metallic constituents in waste water. CO1- U (16)

Or

(b) Mention different terminologies used in waste water treatment & write their importance. CO1- U (16)

17. (a) Discuss about the various criteria for process selection. CO2- U (16)

Or

(b) Discuss in detail about the various components of waste water flows. CO2- U (16)

18. (a) Write the role of unit processes in waste water treatment. CO3- U (16)

Or

(b) Write a detail account on Chemical neutralization in waste water treatment. CO3- U (16)

19.	(a)	Explain basic Principle and details about bacterial growth and kinetics.	CO4- U	(16)
		Or		
	(b)	Explain the types of biological process in waste water treatment.	CO4- U	(16)
20.	(a)	Write a detail overview of membrane separation process in Waste water treatment.	CO5- U	(16)
		Or		
	(b)	Explain the working hollow fiber and spiral wound membrane with a neat sketch. op k-€ model equation for the turbulence flow.	CO5- U	(16)