

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VIII (NEW) EXAMINATION – WINTER 2020

Subject Code:2181308
Date:19/01/2021
Subject Name:Advanced Wastewater Treatment Technologies
Time:02:00 PM TO 04:00 PM
Total Marks: 56
Instructions:

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

			MARKS
Q.1	(a)	Define: Advanced wastewater treatment	03
	(b)	Describe types of Ion exchange resin	04
	(c)	Discuss the factors that are to be taken into consideration while selecting advanced wastewater treatment	07
Q.2	(a)	Define: Adsorption, adsorbate, adsorbent	03
	(b)	Enlist the various terminologies used for membrane filtration	04
	(c)	Discuss with the neat sketch biological phosphorous removal	07
Q.3	(a)	What do you mean by the term advanced oxidation	03
	(b)	With the help of a neat sketch show membrane bioreactor (MBR) configuration	04
	(c)	Prepare a table showing general characteristics of membrane processes	07
Q.4	(a)	Give examples of technologies used to produce the reactive hydroxyl free radical	03
	(b)	Enlist pros and cons of MBR	04
	(c)	Write a short note: membrane fouling	07
Q.5	(a)	Enlist the application of Electro-floatation	03
	(b)	Discuss in brief mechanism of Electrocoagulation	04
	(c)	Discuss in details: Carbon regeneration and reactivation	07
Q.6	(a)	Enlist the materials used for electrodes in Electro-oxidation process.	03
	(b)	Explain the factors affecting Electrocoagulation	04
	(c)	Explain in details with all the relevant equations design of granular activated carbon contactor	07
Q.7	(a)	Draw only the flow diagram for the removal of ammonia by zeolite exchange	03
	(b)	With reference to the advanced oxidation process, explain the terms radical addition and radical combination	04
	(c)	Discuss in details application of Ion Exchange	07

Q.8	(a)	Enlist the parameters that affect the removal of heavy metals using ion exchange	03
	(b)	With reference to the advanced oxidation process, explain the terms hydrogen abstraction and electron transfer	04
	(c)	Write down all the important ion-exchange reactions for synthetic resins	07

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