Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2023

Subject Code:3154404 Date:18-12-2023

Subject Name:Waste to Energy

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Define: BOD, Heating value, incineration.	**03**
	(b)	What is waste? Discuss the characterization of waste in brief.	**04**
	(c)	Write a brief note on Routes for Energy production from waste.	**07**
Q.2	**(a)**	What is the purpose of syngas generation?	**03**
	(b)	What is the energy conversion of pyrolysis?	**04**
	(c)	Discuss the present scenario for Energy from waste.	**07**
		OR	
	(c)	Classify microalgae phyla.	**07**
Q.3	**(a)**	How does an anaerobic digester work?	**03**
	(b)	Discuss on fabric filters.	**04**
	(c)	What Is Gasification? Explain chemistry of the gasification process.	**07**
		OR	
Q.3	**(a)**	What are the advantages of pyrolysis?	**03**
	(b)	Explain basis of the transesterification process.	**04**
	(c)	What Is Gasification? Explain chemistry of the gasification process.	**07**
Q.4	**(a)**	Discuss the electron transfer mechanism.	**03**
	(b)	Compare various liquid extraction processes.	**04**
	(c)	Determine the volume of digester chamber and dimension of the chamber for the biogas production from the cow dung of 10 cows having body weight of 200 kg each. Assume the temperature is 30^{o}C. the solid component of cow dung is 16% HRT is 40 days. One cow produces 10 kg cow dung daily.	**07**
		OR	
Q.4	**(a)**	Discuss parameters which affect the MFC operations.	**03**
	(b)	Write a short note on Biodiesel.	**04**
	(c)	a municipal solid waste based power plant is emitting 45,000 meter cube per hour flue gas it is proposed to install and ESP with a collection efficiency of96.8 percent, calculate the total area of the collection electrodes if the collection efficiency is 99.5 percent, how much additional collection electrode area would be needed drift velocity of the particles has been determined experimentally at 0.13 meter per second.	**07**
Q.5	**(a)**	List the different types of transeserification processes.	**03**
	(b)	What is flocculation and how it is works?	**04**
	(c)	Discuss opportunities and challenges for waste to energy concept in India.	**07**

OR

Q.5	**(a)**	Discuss Mechanism of oil extraction using solvent.	**03**
	(b)	Discuss strategies for enhanced lipid accumulation.	**04**
	(c)	Comparison of open and closed photo bioreactor.	**07**

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