Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2024

Subject Code:3154404 **Date:12-12-2024**

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 the energy conversion of Pyrolysis ?	**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 Waste ? Discuss the characterization of Waste in brief.	**04**
	(c)	Classify Microalgae Phyla.	**07**
		OR	
	(c)	Discuss the present scenario for Energy from waste.	**07**
Q.3	**(a)**	What are the advantages of Pyrolysis ?	**03**
	(b)	Discuss about fabric filters.	**04**
	(c)	What is Gasification ? Explain Chemistry of the Gasification Process.	**07**
		OR	
Q.3	**(a)**	How does an Anaerobic digester work ?	**03**
	(b)	Explain basis of the Transesterification process.	**04**
	(c)	Explain energy production from wastes through Pyrolysis and Gasification.	**07**
Q.4	**(a)**	What is Microbial fuel cells ?	**03**
	(b)	Write a short note on Biodiesel.	**04**
	(c)	An electrostatic precipitator (ESP) with 5600 m^2 of collector plate area is 96 percent efficient in treating 185 m^3/s of flue gas from a 200 MW thermal power plant. It was found that in order to achieve 97 percent efficiency, the collector plate area should be 6100 m^2. In order to increase the efficiency to 99 percent, the ESP collector plate area (expressed in m^2).	**07**
		OR	
Q.4	**(a)**	Discuss the Electron Transfer Mechanism.	**03**
	(b)	Compare various Liquid Extraction Processes.	**04**
	(c)	Discuss Energy production from organic wastes through fermentation and anaerobic digestion.	**07**

Q.5	**(a)**	Discuss Mechanism of oil Extraction using Solvent.	**03**
	(b)	What is Flocculation and explain how it works ?	**04**
	(c)	Comparison of open and closed Photo Bioreactor.	**07**
		OR	
Q.5	**(a)**	List the different types of Transesterification processes.	**03**
	(b)	Discuss strategies for enhanced lipid accumulation.	**04**
	(c)	Discuss opportunities and challenges for waste to energy concept in India	**07**

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