

Enrolment No./Seat No _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE(MINOR)- SEMESTER-I&II EXAMINATION – SUMMER 2025

Subject Code:115AB02

Date:05-06-2025

Subject Name:Waste Heat and Energy Recovery

Time:02:30 PM TO 05:00 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) What is "Energy from waste"?	03
(b) Write the name of main technologies used for converting waste into energy? Explain any one from that.	04
(c) Differentiate between Agro-based waste and Industrial waste with examples.	07
Q.2 (a) What are the main steps involved in preparing MSW for energy recovery?	03
(b) Define thermal efficiency and explain how it can be improved in waste-to-energy plants?	04
(c) How does waste heat recovery contribute to improving energy efficiency?	07
OR	
(c) Explain the advantages and limitations of gasification for waste-to-energy conversion.	07
Q.3 (a) What is gasification? How is it different from combustion?	03
(b) Write short note on: Incineration.	04
(c) What is anaerobic digestion? What are the stages involved in the anaerobic digestion process?	07
OR	
(a) Discuss the role of microorganisms in the fermentation process.	03
(b) What is pyrolysis? How does it differ from gasification?	04
(c) What factors should be considered when selecting a waste-to-energy technology for a particular type of waste?	07
Q.4 (a) What is a heat pump? Explain its working principle with a neat diagram.	03
(b) How is a heat pump different from a conventional heating system?	04
(c) What is the role of piston-driven devices in waste-to-energy systems?	07

OR

- (a) What are the types of heat recovery systems used with incinerators? **03**
 - (b) Compare rotary and piston-driven energy recovery devices. **04**
 - (c) Write about the major technologies used for storing energy recovered from waste? **07**
- Q.5**
- (a) Why is energy storage important in waste-to-energy systems? **03**
 - (b) What is waste valorization? How does it differ from simple waste disposal? **04**
 - (c) Which are the different methods of waste valorization. **07**

OR

- (a) Explain the role of combustion in waste-to-energy processes. **03**
- (b) What is electro-coagulation? Describe the basic principle for electro-coagulation. **04**
- (c) Which are the challenges faced in recycling and reuse of industrial waste? **07**
