

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - V EXAMINATION - WINTER 2025

Subject Code: 115AB02

Date: 08-12-2025

Subject Name: Waste Heat and Energy Recovery

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) What is meant by energy from waste?	03
(b) Define municipal solid waste (MSW) in the context of energy recovery.	04
(c) Describe the role of forest residues in energy recovery.	07
Q.2 (a) What are the main steps involved in preparing MSW for energy recovery?	03
(b) Write the name of main technologies used for converting waste into energy? Explain any one from that.	04
(c) What are the main challenges in using MSW for energy production?	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) What is anaerobic digestion? Mention name of its by-product.	03
(b) Write the name of different methods of waste heat recovery in industries.	04
(c) Explain the pyrolysis process for plastic waste and list its products.	07
Q.4 (a) What is a heat pump? Explain its working principle with a neat diagram.	03
(b) Define Refuse-Derived Fuel (RDF) in the context of waste-to-energy.	04
(c) What factors should be considered when selecting a waste-to-energy technology for a particular type of waste?	07
OR	
(a) Name two methods to recover heat from incinerators.	03

- (b) Compare Rotary and Piston-driven energy recovery devices. 04
- (c) Explain the advantages and limitations of heat recovery systems in industrial processes. 07
- Q.5** (a) What is meant by Valorization of waste? 03
- (b) State two advantages of recycling in industrial processes. 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) Describe the environmental benefits of recycling of industrial waste. 04
- (c) Which are the challenges faced in recycling and reuse of industrial waste? 07
