Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160916 Date:11-12-2023

Subject Name:Energy Conservation

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.**

Q.1	**(a)**	Explain objective and general principles of Energy management.	**03**
	(b)	Classify energy audit & explain the three phases of detailed energy audit.	**04**
	(c)	Write function and working of various energy audit instruments.	**07**
Q.2	**(a)**	How losses are reduced in Transformer ?	**03**
	(b)	Explain the effects of harmonics and improvement method.	**04**
	(c)	Describe technical aspects of energy efficient motors and energy saving by it.	**07**
		OR	
	(c)	Enlist disadvantages of low power factor. Discuss Methods of Power factor improvements.	**07**
Q.3	**(a)**	Write down its advantages and properties of thermal insulating material.	**03**
	(b)	What is FBC Boilers? Write difference between FBC and PFBC boilers.	**04**
	(c)	List factors affecting furnace performance. Describe factors affecting fuel economy in furnaces.	**07**
		OR	
Q.3	**(a)**	What are the Advances in boiler technologies.	**03**
	(b)	Describe Water treatment and its impact on boiler losses.	**04**
	(c)	Discuss the sources of waste heat and its potential applications.	**07**
Q.4	**(a)**	Compare reciprocating and rotary air compressor	**03**
	(b)	Enumerate the energy saving opportunities in cooling towers.	**04**
	(c)	Explain energy conservation opportunities in pump and pumping system.	**07**
		OR	
Q.4	**(a)**	Write about performance of pumps in parallel and series operation.	**03**
	(b)	Discuss the energy conservation in blower.	**04**
	(c)	Describe the methods to improve performance of compressed air system.	**07**
Q.5	**(a)**	Classify heat recovery systems and explain any one in detail.	**03**
	(b)	Discuss the energy conservation by demand side management (DSM).	**04**
	(c)	Describe energy saving using LED, soft starter and variable speed drive.	**07**
		OR	
Q.5	**(a)**	State the advantages and limitations of NPV and Payback period.	**03**
	(b)	List out the types, applications and advantages of blowers.	**04**
	(c)	Discuss Steam Utilization Properties, distribution and losses & steam trapping.	**07**

****