Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160916 Date: 28-05-2025

Subject Name: Energy Conservation

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 the importance of energy audit?	**03**
	(b) Enlist the classification of furnaces.	**04**
	(c) Explain the guidelines for writing energy audit report.	**07**
Q. 2	**(a)** List out the applications and advantages of blowers	**03**
	(b) Short note on general principles of Energy Management.	**04**
	(c) Explain the performance of pumps in parallel and series operation.	**07**
	OR	
	(c) Explain in detail various methods of Energy Conservation in Compressors.	**07**
Q.3	**(a)** Explain types of pumps.	**03**
	(b) Which are the various applications of blowers?	**04**
	(c) Describe various methods of Energy Conservation in Pumps.	**07**
	OR	
Q.3	**(a)** What is FBC Boilers?	**03**
	(b) Explain the general principal of energy management and skill required for energy management.	**04**
	(c) Write short notes on water loss in cooling tower.	**07**
Q.4	**(a)** Explain Demand Side Management in detail.	**03**
	(b) What are the causes of high transmission and distribution losses?	**04**
	(c) Explain various instruments used for energy audit and monitoring of energy saving.	**07**
	OR	
Q.4	**(a)** Explain the steps to reduce transmission and distribution losses.	**03**
	(b) Explain the procedure to save the energy of a lighting system.	**04**
	(c) How variable frequency drive is useful in energy conservation?	**07**
Q.5	**(a)** What is automatic power controller? Explain in details.	**03**
	(b) What are the characteristics of energy efficient motors? Explain in details.	**04**
	(c) What is significant of soft starter? How it is saving energy?	**07**
	OR	
Q.5	**(a)** Explain various methods of energy conservation in house.	**03**
	(b) What is waste heat recovery system? State its advantages and disadvantages.	**04**
	(c) Explain energy saving in cooling towers.	**07**

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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160916 **Date:22-05-2024**

Subject Name:Energy Conservation

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 energy audit? Explain elements of energy audit.	**03**
	(b)	Define the following: i) Payback period ii) ROI iii) NPV iv) IRR	**04**
	(c)	Explain guidelines for writing energy audit report.	**07**
Q.2	**(a)**	Explain role of Bureau of Energy Efficiency (BEE).	**03**
	(b)	Explain general principle of energy management.	**04**
	(c)	State advantages of parallel operation of transformer.	**07**
		OR	
	(c)	Explain power factor improvement using: i) Static Capacitors ii)Synchronous Condenser	**07**
Q.3	**(a)**	Explain impact of harmonics and explain any one method to reduce it.	**03**
	(b)	Explain advantages of soft starter over conventional starters.	**04**
	(c)	State and explain characteristics of energy efficient motors.	**07**
		OR	
Q.3	**(a)**	List advantages of electronic ballast.	**03**
	(b)	Explain steps for energy saving in any residential application.	**04**
	(c)	Write a technical note on: Variable Speed Drive (VSD)	**07**
Q.4	**(a)**	Compare fire tube boiler and water tube boiler.	**03**
	(b)	Explain feedwater treatment and its impact on boiler losses.	**04**
	(c)	Explain intermittent blowdown and continuous blowdown in a boiler.	**07**
		OR	
Q.4	**(a)**	Explain PFBC boiler.	**03**
	(b)	Draw and explain schematic diagram for flow of water, steam and flue gases in a boiler plant.	**04**
	(c)	Explain energy efficiency measures in furnace system.	**07**
Q.5	**(a)**	What are advantages and disadvantages of compressed air system?	**03**
	(b)	Enlist the parameters to evaluate the performance of cooling tower.	**04**
	(c)	Explain various methods for energy conservation in compressors.	**07**
		OR	
Q.5	**(a)**	Explain various applications of blowers.	**03**
	(b)	Explain fan efficiency with necessary mathematical equations.	**04**
	(c)	Explain Head-Discharge characteristics for pumps operated in series and parallel.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160916 Date:12-07-2023

Subject Name:Energy Conservation

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)**	Explain importance of energy conservation and role of standards and labelling in it.	**03**
	(b)	Compare preliminary audit and detailed audit.	**04**
	(c)	Explain various instruments used for performing energy audit.	**07**
Q.2	**(a)**	Define Harmonics and explain causes of it.	**03**
	(b)	Explain various methods for reduction of losses in transformer.	**04**
	(c)	Explain energy conservation in commercial lighting system.	**07**
		OR	
	(c)	Write a technical note on: Demand Side Management (DSM)	**07**
Q.3	**(a)**	Explain limitations of energy optimization projects.	**03**
	(b)	Explain methods to reduce Transmission and Distribution (T&D) losses.	**04**
	(c)	Explain feed water treatment and its impact on boiler losses.	**07**
		OR	
Q.3	**(a)**	Explain skills required for Energy Manager.	**03**
	(b)	Explain causes of low power factor.	**04**
	(c)	Explain methods for performance evaluation in boiler system.	**07**
Q.4	**(a)**	Explain benefits of blowdown in a boiler.	**03**
	(b)	List factors affecting furnace performance.	**04**
	(c)	Write a technical note on: Series and parallel operations of pumps.	**07**
		OR	
Q.4	**(a)**	Define Pump. List various applications of pump.	**03**
	(b)	Explain classification of pumps.	**04**
	(c)	Explain scope of energy saving in steam distribution system.	**07**
Q.5	**(a)**	Explain applications of air compressor.	**03**
	(b)	Write a technical note on: Atmospheric Fluidized Bed Combustion system (AFBC).	**04**
	(c)	Explain energy saving in pumps. Also discuss the effect of oversizing the pump.	**07**
		OR	
Q.5	**(a)**	Explain energy saving in cooling towers.	**03**
	(b)	Write a technical note on : Thermic Fluid Heaters.	**04**
	(c)	Describe various methods of energy conservation in blowers.	**07**

Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160916 Date:08/06/2022

Subject Name:Energy Conservation

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 Energy Audit? Why it is important?	**03**
	(b)	Define General Principles of Energy Management.	**04**
	(c)	Discuss Economics of implementation of energy optimization projects, its constraints, barriers and limitations.	**07**
Q.2	**(a)**	What do mean of Energy Management Skills?	**03**
	(b)	List out Instruments for Audit and Monitoring Energy and Energy Savings.	**04**
	(c)	Discuss Guidelines for writing energy audit report.	**07**
		OR	
	(c)	Discuss Case studies of implemented energy cost optimization projects in electrical utilities as well as thermal utilities.	**07**
Q.3	**(a)**	Write Importance of parallel operations in power system.	**03**
	(b)	List out the Methods of Reductions of Transformers loss.	**04**
	(c)	Write a short note on “Demand Side management (DSM)”.	**07**
		OR	
Q.3	**(a)**	Define T & D losses.	**03**
	(b)	What do you mean by Load Management?	**04**
	(c)	Write a short note on “Energy efficient Motors”	**07**
Q.4	**(a)**	List out the Methods of Power factor improvements.	**03**
	(b)	Define Automatic power factor Controllers.	**04**
	(c)	Discuss Case Studies related to Power factor improvement in detail.	**07**
		OR	
Q.4	**(a)**	Define Water treatment and its impact on boiler losses.	**03**
	(b)	What are the Advances in boiler technologies.	**04**
	(c)	Discuss heat recovery boilers with it’s Limitations and Constrains.	**07**
Q.5	**(a)**	List out the Types and classifications of Furnace.	**03**
	(b)	Define Furnaces refractory- types and sections.	**04**
	(c)	Discuss Steam Utilization Properties, distribution and losses & steam trapping,	**07**
		OR	
Q.5	**(a)**	List out the Types and application of Pumps.	**03**
	(b)	Define Energy Saving in Pumps & Pumping Systems.	**04**
	(c)	Write a short note on “Energy Saving in Compressors & Compressed Air Systems”.	**07**

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