Total number of printed pages:02 **PG/2nd Semester/PGET 201**

2023

Energy Management and Auditing

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	What are the principles of energy management?	3
	b)	What is the need for managerial skills in energy management?	2
	c)	What do you mean by energy audit?	2
	d)	Write a note on various forms of energy with examples.	4
	e)	List down at least four responsibilities of an Energy Manager.	4
	f)	Why Sankey diagram is useful in energy balance calculations? Draw a typical Sankey diagram of reheating furnace	2+3
2.	a)	Discuss the energy saving opportunities in lighting.	5
	b)	What are the energy conservation opportunities in boiler.	5
	c)	What are the different types of energy audit? Explain the steps involved in detailed energy audit.	10
3.	a)	What is the purpose of material and energy balance?	2
	b)	Explain briefly the difference between preliminary and detailed energy audits?	6
	c)	Discuss the functions of any five energy audit instruments.	5
	d)	What do you understand by the term fuel substitution? Give examples.	3
	e)	Write a note on various forms of energy with examples.	4
4.	a)	Write a short note on Benchmarking.	5
	b)	Explain briefly the terms – 'Energy Conservation' and 'Energy Efficiency'.	5+5=10
	c)	Enumerate the benefits of energy efficiency for industries, nation and the	5

		globe.	
5.	a)	Write about the losses of an induction motor and show the power stages of Induction motor.	5+2=7
	b)	Write the names of different types of motors used in industries.	6
	c)	A small commercial establishment has the following loads with their daily average run-time – Lightning load of 700W, working for 6Hrs/day Fans of total 850W, working for 8 Hrs/day 2 Nos. Pump motors each of of 1HP, working for 30 minutes/day 5 Nos. Desktop computers, each of 100W, working for 4 Hrs/day Power load of 1.5kW, working for 1 Hr/day Estimate the total electrical energy consumption for the month of June.	7
6.	a)	Write the full form of the following in the study of energy conservation - S&L, DSM, BLY, MEPS, BEE	1×5=5
	b)	Write a short note on 'Energy Conservation Building Codes (ECBC)'	5
	c)	Show the calculations of power factor correction by capacitors with the help of power triangle. What is the importance of power factor correction ?	10