Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 80003

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025
Third Semester
Power Systems Engineering
P23PSE17– ENERGY CONSERVATION IN ELECTRICAL SYSTEMS
(Regulation 2023)

Time: Three Hours Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Comment on Integrated Energy Policy.	2	K2	CO1
2.	Mention the role of Bureau of Energy Efficiency.	2	K2	CO1
3.	What is bench marking in energy management?	2	K1	CO2
4.	Give examples of fuel substitution in industries.	2	K1	CO2
5.	Enumerate the functions of maximum demand control devices.	2	K2	CO3
6.	Write the benefits of power factor improvement.	2	K2	CO3
7.	State the purpose of a soft starter.	2	K2	CO4
8.	Justify the role of electronic ballasts in lighting systems.	2	K2	CO4
9.	List the factors affecting compressor performance.	2	K2	CO5
10.	Write the impact of leaks in compressed air systems.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Discuss the environmental impacts of energy production and consumption. Suggest measures to reduce them.	13	K2	CO1
		(OR)			
	b)	Describe the relationship between energy, environment, and sustainable development in India.	13	K2	CO1
12.	a)	Discuss in detail the approach to conducting energy audit, including data collection, analysis, and recommendations.	13	K2	CO2
		(OR)			
	b)	Explain strategies and methods for i. Matching the use of energy to the demand. ii. Optimizing input energy requirements in industrial processes. iii. Maximizing system efficiency.	13	K2	CO2
13.	a)	Explain maximum demand control techniques and their importance in industries.	13	K2	CO3
		(OR)			
	b)	Discuss the selection criteria and proper location of power factor correction capacitors in distribution systems. Also explain how to assess the effectiveness of power factor capacitors.	13	K2	CO3
14.	a)	Define Automatic Power Factor Controller. Discuss the principle, operation, and advantages of automatic power factor controllers.	13	K2	CO4
		(OR)			
	b)	Describe energy efficient transformers in terms of the design improvements, loss reduction, and economic benefits.	13	K2	CO4
15.	a)	With neat diagrams, explain the different types of air compressors and mention their applications. Discuss the factors affecting the compressor efficiency.	13	K3	CO5
		(OR)			
	b)	Explain in detail the major components of a compressed air system and their functions. Analyze the factors affecting the performance of compressed air systems.	13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Compare the life cycle cost of an energy-efficient motor with a conventional motor. Explain how soft starters and variable speed drives can further improve performance and efficiency.	15	K4	CO4
		(OR)			
	b)	A factory reports that its compressed air system consumes nearly 20% of the total electricity, with frequent pressure drops and high leakage losses. As an energy auditor, propose a detailed strategy to improve the system efficiency. Your answer should cover types of compressors, efficiency factors, leakage testing, capacity assessment, and possible energy-saving opportunities.	15	K4	CO5