R20 Regulation *Subject code: 3E6BA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Regular/Supplementary Examinations, July 2024

ELECTRICAL ENERGY CONSERVATION AND AUDITING

(Professional Elective II)

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Maximum Marks: 70 Date:30.07.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A		
All the following questions carry equal marks (10X2M=20 Marks)		CO	Bloom Tx
1	What is meant by 'long-term energy scenario'?	CO1	BL1
2	Define commercial and non-commercial energy with examples.	CO1	BL1
3	Compare sensible heat and latent heat.	CO2	BL2
4	How are units and conversion important in energy management?	CO2	BL2
5	How can energy costs be understood and managed effectively?	CO3	BL2
6	Give the significance of benchmarking in the context of energy performance.	CO3	BL2
7	List the benefits of power factor improvement.	CO4	BL1
8	Mention the distribution losses. How can they be minimized?	CO4	BL1
9	What are maximum demand controllers?	CO5	BL1
10	What is the function of air compressor?	CO5	BL1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	Discuss the followings: a) Primary and Secondary energy [3] b) Commercial and Non commercial energy [3] c) Renewable and Non-Renewable energy [4]	CO1	BL2
	OR		
12	Discuss about the Energy Conservation Act, 2001 and its Features. [10]	CO1	BL3
13	Explain the principles of heat transfer, including conduction, convection, and radiation. Discuss their applications in energy systems. [10]	CO2	BL3
	OR		
14	a) Discuss the benefits and challenges associated with power factor correction. [5] b) A three phase, 10 kW motor has the name plate details as 415 V, 18.2 amps and 0.9 PF. Actual input measurement shows 415 V, 12 amps and 0.7 PF which was measured with a power analyzer during motor running. Find the following:	CO2	BL4

	(i) Rated output and rated input at full load (ii) The motor efficiency at full load [5]		
15	Present a detailed report on the three phases of Energy Audit Methodology. [10]	CO3	BL3
	OR		
16	Discuss the various instruments used in energy audits. Explain their functions and discuss how they contribute to the accuracy of audit. [10]	CO3	BL3
17	Discuss the followings: (a) Types of transformers. [5] (b) Transformer Losses and Efficiency. [5]	CO4	BL3
	OR		
18	Discuss the components and structure of an electricity bill. Explain how understanding the bill can help in managing energy consumption and costs. [10]	CO4	BL3
19	Explain different types of compressors used in Industrial applications. [10]	CO5	BL4
	OR		
20	(a) Explain the importance of regular maintenance and leakage testing in compressed air systems. [5] (b) In the leakage test in a process industry, following results were observed Compressor capacity (m^3/minute) = 35 Cut in pressure, kg/cm^2 (g) = 6.8 Cut out pressure, kg/cm^2 (g) = 7.5 Load kW drawn = 188 kW Unload kW drawn = 54 kW Average 'Load' time, T = 1.5 minutes Average 'Unload' time, t = 10.5 minutes Comment on leakage quantity and avoidable loss of power due to air leakages. [5]	CO5	BL4