

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Seventh Semester

Electrical and Electronics Engineering**20EEEL703 - ENERGY MANAGEMENT AND AUDITING**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. MTR in energy auditing often involves which of the following? (a) Measuring temperature changes (b) Recording and analyzing energy consumption data (c) Calculating building floor area (d) Estimating fuel costs	1	K1	CO1
2. Why is it important to set energy targets? (a) To increase energy consumption (b) To enhance the appearance of energy meters (c) To establish specific goals for reducing energy consumption (d) To increase energy waste	1	K1	CO1
3. The speed of the motor can be varied by ____ (a) Changing supply frequency (b) Changing number of poles (c) Using multi speed windings (d) All the above	1	K1	CO2
4. The rating of the capacitor at motor terminals should not be greater than ____ . (a) magnetizing kVAR of the motor at full load (b) magnetizing kVAR of the motor at no load (c) magnetizing kVAR of the motor at half load (d) magnetizing kVAR of the motor at 75% load	1	K1	CO2
5. Air compressor alone consumes about_____ of the energy generated in a gas turbine (a) 20-30% (b) 30-40% (c) 40-50% (d) 50-60%	1	K1	CO3
6. In the context of cogeneration turbine, the thermodynamic process taking place is (a) expansion (b) condensation (c) contraction (d) both (a) & (c)	1	K1	CO3
7. How can lighting energy be optimized by focusing on specific tasks or work areas? (a) Implementing adaptive lighting (b) Using occupancy sensors (c) Implementing task lighting (d) Applying daylight harvesting	1	K1	CO4
8. What strategy divides spaces into different lighting zones for independent control of illumination levels? (a) Task lighting (b) Zoning (c) Reflective surfaces (d) Daylight harvesting	1	K1	CO4
9. What aspect of metering is crucial for ensuring reliable data collection and analysis by maintaining measurement accuracy? (a) Integration (b) Compliance with standards (c) Accuracy and calibration (d) Maintenance and upkeep	1	K1	CO5
10. Activity Based Costing focuses on _____. (a)Efficient management (b) Effective cost control (c)Performance management (d) Cost reduction	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. Classify HDD & CDD.	2	K2	CO1
12. Define CUSUM Analysis.	2	K1	CO1
13. What is nominal efficiency?	2	K1	CO2
14. Infer the various motor performances according to torque classification.	2	K2	CO2

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| 15. List Cogeneration types. | 2 | K1 | CO3 |
| 16. Compare Reciprocating Engine and Combustion Turbine. | 2 | K2 | CO3 |
| 17. Show how to ensure energy efficiency in lightning system. | 2 | K1 | CO4 |
| 18. List various lightning sources. | 2 | K1 | CO4 |
| 19. Outline the functions of utility meter. | 2 | K2 | CO5 |
| 20. Outline the error in instrument transformer. | 2 | K2 | CO5 |
| 21. Illustrate the economic model of energy. | 2 | K2 | CO6 |
| 22. Demonstrate how to calculate electrical energy loss. | 2 | K2 | CO6 |

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

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| 23. a) Explain the key steps involved in Energy monitoring, targeting and reporting. | 11 | K2 | CO1 |
| OR | | | |
| b) Explain Energy Accounting Procedure in detail. | 11 | K2 | CO1 |
| 24. a) Summarize the need of transformers in energy management in detail. | 11 | K2 | CO2 |
| OR | | | |
| b) Explain synchronous machine control and energy management in detail. | 11 | K2 | CO2 |
| 25. a) Explain gas turbine-based cogeneration system with figure in detail. | 11 | K2 | CO3 |
| OR | | | |
| b) Outline the features of cogeneration. | 11 | K2 | CO3 |
| 26. a) Summarize the various types of light sources & discuss about its luminous performance characteristics. | 11 | K2 | CO4 |
| OR | | | |
| b) Explain the effect of power factor & harmonics. | 11 | K2 | CO4 |
| 27. a) Infer the expression for CT and PT transformer burden and describe with example of meter location and requirement. | 11 | K2 | CO5 |
| OR | | | |
| b) Explain about the Multitasking solid state meters in Energy Management. | 11 | K2 | CO5 |
| 28. a) Explain HVAC and energy management. | 11 | K2 | CO6 |
| OR | | | |
| b) Summarize the possibilities of demand control to load management. | 11 | K2 | CO6 |