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Question Paper Code : 80555

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Sixth/Eighth Semester

Electrical and Electronics Engineering

EE 8016 – ENERGY MANAGEMENT AND AUDITING

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Enumerate any four energy management opportunities in lighting systems.
2. List out the objectives of energy management.
3. Brief on the energy management in Electrical interconnection.
4. List the opportunities of energy savings in transformers and reactors.
5. Give the effects of harmonics in lighting system.
6. Mention the causes of poor power factor.
7. What is meant by “burden” relevant to instrument transformers?
8. What are instrument transformers?
9. List out the demand control techniques.
10. What is meant by HVAC system and lists its advantages?

PART B — (5 × 13 = 65 marks)

11. (a) Define Energy Auditing. Explain the various steps involved in energy auditing.

Or

- (b) Write notes on the following

- (i) Methods of Energy accounting. (6)
- (ii) Energy monitoring. (7)

12. (a) Discuss the energy saving recommendations of the synchronous machine.

Or

(b) Discuss in detail about the feasibility of cogeneration.

13. (a) Explain in detail about optimizing the lighting energy system with an example.

Or

(b) Explain in detail about Fluorescent lamp and also discuss the energy saving opportunities.

14. (a) Explain the operation of the instrumentation transformer and also explain the burdens of Instrumentation transformer.

Or

(b) Analyze the best practices of metering technique with examples.

15. (a) Explain the different types of economic models used in energy management.

Or

(b) Discuss the different methods of return on investment analysis for energy projects with suitable example.

PART C — (1 × 15 = 15 marks)

16. (a) Explain all the possible energy conservation measures in lighting power consumption conventional 9 Watts loss Tube light Ballast was replaced with 2 Watts loss Electronic Ballast and 40 Watts Tube lights are replaced with 36 Watts tube lights in 750 Nos. of single Lamp Tube light Fittings. The cost of Electronic Ballast and 36 Watts Tube lights are Rs.225 and Rs.45/- per unit. Calculate the power and energy savings potential, if the mill operates for 8000 hours in a year. Also calculate the investment required and payback period for the above ENCON proposal, when the energy cost is Rs. 4.50 per kWh.

Or

(b) (i) Which is the best location for capacitors banks for power factor improvement from energy conservation point of view? For your answer, Give the detailed explanation. (8)

(ii) Explain the types of losses in an electric motor. List down the various opportunities for energy saving in case of under-loaded motors. (7)