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Total Number of Pages: 02

Course: B.Tech  
Sub\_Code: REL5D002

6<sup>th</sup> Semester Regular/Back Examination: 2024-25  
SUBJECT: Electrical Energy Conservation and Auditing  
BRANCH(S): MECH

Time: 3 Hours

Max Marks: 100

Q.Code: S031

Answer Question No.1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

**Part-I**

**Q1 Answer the following questions: (2 x 10)**

- What is plant energy performance?
- Outline any two features of energy-efficient transformer.
- Define luminous intensity.
- What is the coefficient of utilisation?
- List four relevant instruments to carry out an energy audit in the electrical laboratory.
- Define the depreciation factor.
- What are you understanding about energy costs?
- What is the 3rd harmonic? Briefly explain it.
- The flux emitted by a lamp in all directions is 800 lumens. Calculate its MSCP.
- Define power quality relating to energy conservation in motors.

**Part-II**

**Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)**

- What is an energy audit? Explain its need.
- Illustrate the load sharing and isolating technique in the transformer to predict energy efficiency.
- Discuss the energy conservation opportunities in the induction motor and its need.
- Explain the working principle of an LED lamp?
- Identify the benefits and applications of availability-based tariffs and power factor tariffs.
- What do you understand by energy management? Elaborate on the various elements of the Energy Management Program (EMP)
- Explain the difference between MHCP and MHSCP.
- Explain one method to improve the power factor of the system.
- Describe the energy conservation technique in power systems by using a reactive power compensator with its benefits and limitations.

- j) Describe the energy management approach that one should adopt.
- k) Give a brief about the various energy auditing instruments.
- l) Describe the Lamberts law or  $\text{Cos}^3\theta$  law.

**Part-III**

**Only Long Answer Type Questions (Answer Any Two out of Four)**

**(16x2)**

- Q3** Describe with a flow chart the detailed energy audit procedure. **(16)**
- Q4** a) Make use of load factor and maximum demand tariff to minimise electrical consumption of the electrical installation. **(8 x 2)**  
b) Differentiate between technical and commercial losses.
- Q5** What are methods are used to improve the power factor in HT and LT supply? **(16)**
- Q6** Illustrate the benefits of time off day and peak off day tariff relevant to energy cost along with its impact on the energy bill. **(16)**