

**Scheme – E**

**Sample Question Paper**

**Course Name : Electrical Engineering / Electrical Power system**

**Course Code : EE /EP**

**Semester : Fifth**

**12150**

**Subject Title : Energy Conservation and Audit.**

**Marks : 100**

**Time:3 Hrs.**

**Instructions:**

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

**Q.1 A) Attempt any THREE of the following:**

**12 Marks**

- a) State four types of classification of energy sources with one example for each.
- b) Define the following terms and state their units. Illumines intensity, Luminous efficacy, Colour Rendering Index, Lux.
- c) List out the factors to be considered while selecting the motor for home appliances.
- d) List out the opportunities for energy conservation techniques in transformers.

**Q.1 B) Attempt any ONE of the following:**

**06 Marks**

- a) Explain the stepwise procedure for assessing energy efficiency of existing hospital lighting system.
- b) How energy conservation can be achieved by improving power factor of Induction motor? Also state how the rating & location of power factor improving equipment s are selected? Suggest the equipment.

**Q.2 Attempt any FOUR of the following:**

**16 Marks**

- a) State the need of energy conservation in India with reference to our the present scenario.
- b) Explain the energy conservation by adopting following techniques...  
-Replacing Lamp Sources: -Using energy efficient Light control equipments.
- c) What are constructional (rotor and stator only) effective operational differences between Conventional motor and Energy efficient motor?

- d) How the use of amorphous transformer and Dry type transformer minimizes the energy usage?
- e) What is co-generation? And state its necessity.

**Q.3 Attempt any FOUR of the following:**

**12 Marks**

- a) State the difference between 'Energy conservation' and 'Energy efficiency' with an example.
- b) How periodical maintenance of motor helps in energy conservation?
- c) State the comparison between Conventional transformer and Energy efficient transformer refer to construction, material used, losses, and cost.
- d) With the help of block diagram state the classification of co-generation systems based on sequence of energy generation.
- e) State any four objectives of Tariff.

**Q.4 A) Attempt any THREE of the following:**

**12 Marks**

- a) State and explain the factors governing the co-generation system.
- b) What is TOD tariff and Power factor tariff? How they help in energy conservation?
- c) State the effects of harmonic currents on distribution network.
- d) Define 'Demand side management' and state its features.

**Q. 4 B) Attempt any ONE of the following:**

**06 Marks**

- a) State different technical losses in transmission system and how it can be reduced ?
- b) What is the effect of Ozone layer depletion on the environment and what are the control measures?

**Q.5 Attempt any FOUR of the following:**

**16 Marks**

- a) With the help of neat labelled diagram explain working of Gas-turbine co-generation system and state the area of application.
- b) Max. demand of an industry is 250 kW at 0.85p.f. lagging with an annual energy consumption of 50,000 kWh. What will be the annual saving in the bill, if p.f. is improved to 0.95 lag.? Given that the tariff is Rs. 50 per kVA maximum demand plus 10 paise per unit.
- c) Explain the following methods of Energy conservation in distribution system....
  - Optimization of distribution system - Balancing of phase load current.
- d) How energy and environment are related to each other?
- e) State the causes of air pollution and different air pollutants.

f) With an example explain how energy flow diagram helps in energy audit procedure.

**Q. 6 Attempt any FOUR of the following:**

**16 Marks**

- a) 'By minimizing idle and redundant running of motor saves energy.' Justify.
- b) State causes of acid rain and its effects on environment.
- c) Refer to present scenario, list out the major steps taken by society to reduce global warming.
- d) List out the instruments required to carryout energy audit procedure in chemical factory.
- e) State IE rules and regulations followed in energy audit program.
- f) State the incentives given in the tariff system of MSEDCL for improved power factor and load factor.