

May 2023

B.Tech.(EL)IV SEMESTER**Electrical Energy Conservation and Auditing (ELPE-411)**

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
 2. Answer any four questions from Part -B in detail.
 3. Different sub-parts of a question are to be attempted adjacent to each other.
 4. Any other specific instructions

PART -A

- Q1 (a) Define the term Coefficient of Utilization. (1.5)
- (b) What is the need of Energy management? (1.5)
- (c) List the various energy instruments. (1.5)
- (d) What is meant by simple payback period? (1.5)
- (e) Write a note on modes of transfer of heat. (1.5)
- (f) Explain how an HVAC system improves the energy efficiency. (1.5)
- (g) Write a note on modes of transfer of heat. (1.5)
- (h) Give the significance of Power factor correction. (1.5)
- (i) Explain the difference between energy efficient motors and standard motors. (1.5)
- (j) Explain the term Return on investment. (1.5)

PART -B

- Q2 (a) What is the significance of energy? Differentiate between commercial and non-commercial sources. (8)
- (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 power analyzer during motor running. (7)
- Q3 (a) Name five designated consumers under the energy conservation act. (8)
- (b) A synchronous motor having a power consumption of 60 kW is connected in parallel with a load of 200 kW having a lagging power factor of 0.86. If the combined load has a power factor of 0.95, what is the value of leading reactive kVA supplied by the motor and at what power factor is it working? (7)
- Q4 (a) Explain the working of a soft starter and its advantage over other conventional starters. (8)
- (b) Describe the various method of detailed energy audits. (7)
- Q5 (a) How energy pricing is done in India? (8)
- (b) Why energy conservation is important in the prevailing energy scenario? (7)

- Q6 (a) Explain the ways by which efficiencies of energy efficient motors are increased. (8)
(b) Discuss one energy conversion activity with various losses occurring stage wise. (7)
- Q7 (a) What are the various steps in the implementation of energy management in an organization? (8)
(b) Select the location of installing capacitor bank, which will provide the maximum energy efficiency. a) Main sub-station b) Motor terminals. (7)
