

**Eighth Semester B.E. Degree Examination, June/July 2019**  
**Energy Auditing and Demand Side Management**

Time: 3 hrs.

Max. Marks:100

**Note:** Answer any FIVE full questions, selecting atleast TWO questions from each part.

**PART - A**

- 1
  - a. Explain following sources of energy with example :
    - i) Primary and Secondary source
    - ii) Commercial and non – commercial source
    - iii) Renewable and non – renewable source. (06 Marks)
  - b. Explain Indian Energy Scenario with relevant facts. (06 Marks)
  - c. List the salient features of :
    - i) Electricity Act 2003
    - ii) Energy conservation Act 2001. (08 Marks)
- 2
  - a. Develop cash flow model to predict future value of uniform series compound amount model. (06 Marks)
  - b. Energy efficiency of an equipment can be improved by 20% through enhanced maintenance leading to a fuel saving of Rs 250000/- per annum for 10 years. What is the maximum allowable investment on the project? Take interest rate as 12%. (06 Marks)
  - c. What is meant by depreciation? Explain the following methods of calculating depreciation reserve : i) Straight line method ii) Sum – of – year digits method iii) Diminishing balance method. (08 Marks)
- 3
  - a. Explain the ten – step approach for energy auditing. (10 Marks)
  - b. Discuss the various measurement and instruments used in energy auditing. (10 Marks)
- 4
  - a. Represent various power components in a power triangle. Give expressions for various power components for 1 – phase and 3 – phase systems. (06 Marks)
  - b. Discuss briefly about presentation of energy audit report. (08 Marks)
  - c. Define Simple payback period. Mention the advantages and disadvantages of simple pay back period. (06 Marks)

**PART - B**

- 5
  - a. Derive an expression for most economical power factor keeping kw – load of consumer constant. (08 Marks)
  - b. What is the capacity of condenser required to improve power factor of a load of 400 kw at 0.8 pf lag to most economical values. The annual minimum cost is given as  $x = 3y$ . Where  
X = annual cost per KVA of Maximum demand.  
Y = annual cost per KVA of pf improvement device. (06 Marks)
  - c. List energy efficient lighting options and lamp controls. (06 Marks)
- 6
  - a. Mention the requirement and objective of good tariff. (08 Marks)
  - b. An industrial consumer has 1 – phase , 230 V supply. The monthly consumption is 2020 units. The maximum demand indicator shows 40A, 0.9 pf for two hours daily which is charged at Rs 3.5 per unit. The remaining units are charged at Rs 1.8 per unit. Determine the monthly bill and average tariff per unit. (06 Marks)
  - c. Write a brief note on ABT. (06 Marks)

- 7 a. Mention benefits of Demand side management implementation from  
i) Society point of view ii) Consumer point of view iii) Supply industry point of view. (08 Marks)
- b. Explain various steps in DSM planning and implementation with relevant flow diagram. (08 Marks)
- c. Explain use of time – of - day tariff for DSM implementation. (04 Marks)
- 8 a. Explain i) Peak clipping ii) Valley filling iii) Strategic conservation iv) Load shedding. (08 Marks)
- b. With a neat diagram, explain plant level organisation to implement DSM. (08 Marks)
- c. Mention factors that influence customer participation in DSM. (04 Marks)