Hall Ticket No | | | | | | | | | | | Question Paper Code: AEEC20

# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

**B.Tech V SEMESTER END EXAMINATIONS (REGULAR/ SUPPLEMENTARY) - FEBRUARY 2024**
**Regulation: UG20**
**(ELECTRICAL ENERGY CONSERVATION AND AUDITING)**
**Time: 3 Hours (ELECTRICAL AND ELECTRONICS ENGINEERING) Max Marks: 70**

**Answer ALL questions in Module I and II**
**Answer ONE out of two questions in Modules III, IV and V**
**All Questions Carry Equal Marks**
**All parts of the question must be answered in one place only**

## MODULE – I

1. (a) Describe a plan for restructuring the energy supply sector of a country to meet future energy requirement. [BL: Understand| CO: 1|Marks: 7]

   (b) Explain the major sources of primary energy resources and their contributions to the overall energy scenario. Provide examples of both commercial and non-commercial energy resources. [BL: Understand| CO: 1|Marks: 7]

## MODULE – II

2. (a) Elaborate the need of an energy audit and its significance in optimizing energy consumption in industrial sectors. [BL: Understand| CO: 2|Marks: 7]

   (b) Evaluate the role of benchmarking in the energy audit process. Discuss its effectiveness in establishing performance standards and identifying areas for improvement. [BL: Apply| CO: 2|Marks: 7]

## MODULE – III

3. (a) Write the power factor improvement techniques and its benefits. Illustrate the components of electricity billing. [BL: Understand| CO: 3|Marks: 7]

   (b) Examine the power loss for motors and factors to be considered for improvement of motor efficiency. [BL: Understand| CO: 3|Marks: 7]

4. (a) Describe the construction and working principle of energy efficient electric motors. [BL: Understand| CO: 4|Marks: 7]

   (b) Determine the best location for capacitor banks to improve power factor from energy conservation point of view. [BL: Understand| CO: 4|Marks: 7]

## MODULE – IV

5. (a) List out different capacity control methods for the fans. Describe the compressed air system components with suitable diagram. [BL: Understand| CO: 5|Marks: 7]

   (b) Identify the various flow control strategies of cooling tower for efficient system operation. [BL: Understand| CO: 5|Marks: 7].

6. (a) Illustrate the basic vapour compression refrigeration system with its schematic diagram. [BL: Understand| CO: 5|Marks: 7]

   (b) Describe the efficient blower system operation and energy conservation opportunities. [BL: Understand| CO: 5|Marks: 7]

## MODULE – V

7. (a) Outline the benefits of soft starters with energy saver techniques in electrical system. [BL: Understand| CO: 6|Marks: 7]

   (b) Discuss the concept of automatic power factor controllers used as energy efficient technologies in electrical system. [BL: Understand| CO: 6|Marks: 7]

8. (a) Mention the energy conservation and efficient opportunities in transformer based on material technology. [BL: Understand| CO: 6|Marks: 7]

   (b) Explain the penalty clause of poor power factor while preparing energy bill with energy inefficient motors in industry. [BL: Understand| CO: 6|Marks: 7]

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