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# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech VI Semester End Examinations (Regular) - May, 2019

Regulation: IARE – R16

## ENERGY AUDIT AND MANAGEMENT

Time: 3 Hours

(EEE)

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

### UNIT – I

1. (a) What is energy audit? Explain the concept of energy audit with an example. What are the various types of energy audit? [7M]
- (b) Consider a company using three energy forms-oils, gas and electricity. The annual energy consumption is tabulated below in various energy units. [7M]

Energy type	Consumption
Oil	10 x10 <sup>3</sup> gal
Gas	5 x 10 <sup>3</sup> therms
Electricity	995 x 10 <sup>3</sup> kwh

Calculate the energy indices.
2. (a) Explain briefly about the following: [7M]
  - (i) Cost index
  - (ii) Fuel substitution
- (b) Discuss about the bench marking in energy audit. Why generally we do use the bench marking in energy management. [7M]

### UNIT – II

3. (a) What are the opportunities that are involved in identifying energy conservation. [7M]
- (b) Explain basic principle of mass and energy balance. Discuss in detail about incremental cost with an example. [7M]
4. (a) What are the various sources of energy, its control and uses? [7M]
- (b) What are the special tests and questionnaire used for energy data gathering. [7M]

### UNIT – III

5. (a) What is the policy of management on employs? Explain about top management commitment and support. [7M]
- (b) Explain the steps involved in the force field analysis. Take your own industry as an example, List down the positive and negative forces. [7M]

6. (a) What are the prerequisites for successful energy management program? [7M]  
(b) Discuss the importance of training for effective energy management. [7M]

**UNIT – IV**

7. (a) Describe the thermal laws used in the energy audit. [7M]  
(b) Explain various methods for preparing process flow and materials. [7M]
8. (a) What is management information system(MIS)? Explain in detail about various roles and responsibilities management in the process of energy audit. [7M]  
(b) Explain in detail about energy modeling. What its requirement in the process of energy audit? Explain. [7M]

**UNIT – V**

9. (a) Explain the function and use of [7M]  
(i) Combustion analyzer  
(ii) Fuel efficiency monitor  
(b) How electrical measuring instruments and speed measurements are used in energy auditing. [7M]
10. (a) Explain the function and application of [7M]  
(i) Pitot tube  
(ii) Water flow meter  
(b) Discuss in detail about stroboscope. Explain about precision and accuracy. [7M]

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