

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: EE482**Course Name: ENERGY MANAGEMENT AND AUDITING**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 5 marks.*

Marks

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| 1 | What are the objectives of energy management? | (5) |
| 2 | Explain the criteria for selection of motors. | (5) |
| 3 | Define thermal efficiency of boiler? Explain the methods of assessing boiler efficiency. | (5) |
| 4 | Explain the classification of waste heat recovery system. | (5) |
| 5 | Explain the needs of energy audit. | (5) |
| 6 | What are the duties of energy manager? | (5) |
| 7 | Compare simple pay back method and present value method. | (5) |
| 8 | Explain the procedure for evaluating proposals using average rate of return method. | (5) |

PART B*Answer any two full questions, each carries 10 marks.*

- 9 The load schedule of a industry is given below

12AM-6AM	6AM-10AM	10AM-2PM	2PM-6PM	6PM-10PM	10PM-12AM
Lightning load	Compressor load and Heating load	Cooling load and Heating load	Motor load	Motor load and Heating load	Lightning load

Power rating of each load is as follows

Lightning load : 2 kW

Compressor load : 4 kW

Heating load : 4.5 kW

Motor load : 3 kW

Cooling load : 2.5 kW

The tariff is as follows :

Time	6AM - 6PM	6PM - 10PM	10PM - 6AM
Rate	Rs. 5/kWh	Rs. 7/kWh	Rs. 3.5 /kWh

- (i) Compute the annual energy bill ? (5)
- (ii) By conducting an energy audit it was found that the heating load working during 6PM-10PM can be shifted to 10PM- 2AM without affecting the process. Compute the annual saving in energy bill by shifting the heating load. (5)
- 10 Explain the energy management opportunities in motor. (10)
- 11 a) Explain different types of industrial loads. (5)
- b) Explain the lighting controls used for energy saving. (5)

PART C

Answer any two full questions, each carries 10 marks.

- 12 Explain the process of boiler blowing down. What are the Benefits of boiler blow down? (10)
- 13 a) What are the factors affecting Air conditioning system performance? (5)
- b) Explain any three energy saving opportunities in steam system. (5)
- 14 a) Define Coefficient of performance. (3)
- b) What are the advantages of waste heat recovery system? Explain. (7)

PART D

Answer any two full questions, each carries 10 marks.

- 15 Explain different schemes of cogeneration system. (10)
- 16 a) Explain Computer aided energy management. (5)
- b) Explain time value of money. (5)
- 17 a) A solar power plant uses twelve mercury vapour lamp of 200 Watts for lighting during night. It was found that high pressure sodium vapour lamp of 150 W produces same lumens compared to the mercury vapour lamp and the ballasts were matching. If the lamps are working for 10 hours a day, compute the simple payback period? Cost of electricity is Rs 5/kWh and cost of one 150W high pressure sodium vapour lamp is Rs. 1600/- (5)
- b) Write short note on (a) Internal rate of return method (5)
- (b) life cycle costing approach
