

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Eighth semester B.Tech degree examinations, September 2020

**Course Code: EE474****Course Name: ENERGY MANAGEMENT AND AUDITING**

Max. Marks: 100

Duration: 3 Hours

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

Marks

- |   |   |     |
|---|---|-----|
| 1 | Define energy management. Discuss the significance of electrical load management.       | (5) |
| 2 | Enumerate the features of energy efficient motors.                                      | (5) |
| 3 | Illustrate blow down process in boilers.  | (5) |
| 4 | Comment on waste heat recovery devices.   | (5) |
| 5 | Discuss on any two energy audit instruments.  | (5) |
| 6 | Mention the principle of cogeneration system.   | (5) |
| 7 | Discuss net present value (NPV) method of evaluating economic feasibility of a project. | (5) |
| 8 | Explain cash flow diagram.  | (5) |

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

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|----|--|------|
| 9  | Explain various peak demand control methodologies.   | (10) |
| 10 | a) Mention the significance of optimal load scheduling   | (5)  |
|    | b) Enlist various energy saving opportunities in electrolytic process  | (5)  |
| 11 | a) A 50kW induction motor with 86 % present full load efficiency is being considered for replacement by a 89 % efficiency motor. What will be the savings in energy if the motor works for 6000 hours per year and cost of energy is Rs. 4.50 per kWh? | (5)  |
|    | b) Discuss any five energy saving methods used in lighting system.   | (5)  |

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

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|----|--|------|
| 12 | Enumerate various energy saving opportunities in steam distribution system.                                      | (10) |
| 13 | a) Discuss any five energy saving methods in furnaces.   | (5)  |
|    | b) Mention the different types and benefits of waste heat recovery system.                                       | (5)  |
| 14 | Define COP of an HVAC system. With the help of a neat schematic explain vapour compression refrigeration system. | (10) |

**PART D**

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

- 15 Discuss in detail on 10 step methodology in detailed energy auditing. (10)
- 16 a) What are the various factors influencing cogeneration choice? (5)
- b) Write a note on IRR method. (5)
- 17 A proposed project requires a capital investment of Rs 20000. The cash flow generated by the project are as shown in the table below. (10)

<b>Year</b>	<b>Cash flow</b>
0	-20000
1	+6000
2	+5500
3	+5000
4	+4500
5	+4000
6	+4000

Calculate the internal rate of return of the project. Assume initial value of  $i$  to be 8%

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