

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
EIGHTH SEMESTER B.TECH DEGREE EXAMINATION(S), OCTOBER 2019

Course Code: ME482

Course Name: ENERGY CONSERVATION AND MANAGEMENT

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

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|---|--|-------|
| 1 | a) Explain the various classifications of energy sources | (5) |
| | b) Discuss the global energy scenario. | (5) |
| 2 | Explain in detail the environmental impacts associated with energy utilization. | (10) |
| 3 | a) Define apparent power, active power, reactive power and power factor. | (8) |
| | b) What do you mean by maximum demand and contract demand? | (2) |
| 4 | Explain the components of electricity bill tariff structure for HT and LT supply | (10) |

PART B

Answer any three full questions, each carries 10 marks.

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|---|--|------|
| 5 | a) With the help of a schematic diagram, explain in detail about the steam system. | (6) |
| | b) Write short notes on steam traps. | (4) |
| 6 | What are the energy conservation methods that can be adopted in a boiler plant? | (10) |
| 7 | a) Discuss the energy conservation opportunities on pumping systems. | (4) |
| | b) Explain the benefits of using Variable Speed Drives on pumping systems. | (6) |
| 8 | a) What are the energy conservation opportunities in a compressor system? | (5) |
| | b) Discuss the energy saving opportunities on HVAC and refrigeration systems | (5) |

PART C

Answer any four full questions, each carries 10 marks.

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| 9 | a) Explain the significance of understanding energy costs. | (4) |
| | b) Write notes on benchmarking of energy consumption. What are its benefits? | (6) |
| 10 | a) Define energy management. What are its objectives? | (5) |
| | b) Define energy audit. What is the need of energy audit? | (5) |
| 11 | a) What are the common instruments that are essential for an energy auditor? | (8) |
| | b) What are the different types of energy auditing? | (2) |
| 12 | a) Explain simple payback period method. What are its advantages and disadvantages? | (8) |
| | b) Define internal rate of return. | (2) |

- 13 a) The annual energy saving potential achieved by introducing an energy conservation proposal in an industry is 6000 units/year. If the initial cost required for the proposal is Rs.1.5 lakhs, calculate the simple payback period. Energy costs may be assumed as Rs.4.00 per unit. (6)
- b) The initial cost required for purchasing a new equipment is Rs.20,000. It is expected to generate a total profit of Rs.30,000 during the next 5 years. Calculate the average rate of return (4)
- 14 Consider the investment and related returns associated with the two alternatives as given in the following table. Select the best alternative out of the two based on : (i) Net Present Value method and (ii) Internal Rate of Return method (10)

Year	Alternative 1	Alternative 2
0	Rs. 100 lakhs (Investment)	Rs. 90 lakhs (Investment)
1	Rs 10 lakhs (Revenue)	Rs 10 lakhs (Revenue)
2	Rs 60 lakhs (Revenue)	Rs 50 lakhs (Revenue)
3	Rs 80 lakhs (Revenue)	Rs 70 lakhs (Revenue)
