

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 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.

Marks

- | | | |
|---|---|-----|
| 1 | a) Compare and contrast conventional and non conventional energy. | (5) |
| | b) Make an outline of the world energy scenario and comment on it. | (5) |
| 2 | a) Climate change is caused by human activity, mostly related to the use of energy. Substantiate your answer. | (7) |
| | b) List out the various types of energy auditing | (3) |
| 3 | a) Prepare a short note on the tariff structure of state electricity billing | (5) |
| | b) With the help of power triangle explain: explain active power and reactive power. | (5) |
| 4 | a) Define the following: Lumens, Lux and Luminous efficacy. | (6) |
| | b) What are the features of an energy efficient motor? | (4) |

PART B

Answer any three full questions, each carries 10 marks.

- | | | |
|---|---|-----|
| 5 | a) With a schematic diagram explain the waste heat recovery systems in a boiler plant. | (7) |
| | b) Is it possible to assess the combustion efficiency of a boiler by flue gas analysis? Explain | (3) |
| 6 | a) Briefly explain flash steam systems. | (5) |
| | b) Steam at 425 degree centigrade and 30 bar pressure is feeding to a turbine kept at a distance of 100 m from the boiler plant. How will you avoid the entry of condensate in steam in to the turbine? Explain | (5) |
| 7 | a) Explain the importance of impeller trimming in pumps. | (5) |
| | b) What are the energy conservation opportunities in a compressor system? | (5) |
| 8 | a) A centrifugal pump installed in a domestic system is not delivering water. Investigate the possible reasons and recommend the corrective measures. | (5) |

- b) During an energy audit in an air-conditioning plant it is observed that the damper provided in the cold air supply duct is partly closed during the working time. Commend on this. (5)

PART C

Answer any four full questions, each carries 10 marks.

- 9 Explain the various types of energy audit in detail. (10)
- 10 Explain the various phases of energy audit. (10)
- 11 Prepare an energy audit report conducted in a domestic system. The building is installed with rooftop PV system and the owner is having a four wheeler also. (10)
- 12 a) A new cogeneration plant installation is expected to reduce the company's annual electricity bill by Rs.4,86,000/-. The capital cost of the new installation is 22,20,000/- and the annual maintenance and operating cost are Rs.42,000/-. Find out the simple payback period. (5)
- b) Define Internal Rate of Return. How it can be found out? (5)
- 13 What is Life Cycle Costing? Explain the components in LCC (10)
- 14 Calculate the NPV of the investment, if the interest rate is 12% and capital investment is Rs. 25 Lakhs and comment on the feasibility of the project. The return from the project is as follows: (10)

| Year | Cash Flow in Lakhs |
|------|--------------------|
| 1 | 3.2 |
| 2 | 3.5 |
| 3 | 4.3 |
| 4 | 3.8 |
| 5 | 4.5 |
| 6 | 5 |
