# 0400EET424052401

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

Name:

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSIT

B.Tech Degree S8 (R,S) / S6 (PT) (R,S) Examination May 2024 (2015)

# **Course Code: EET424**

# **Course Name: ENERGY MANAGEMENT**

Max. Marks: 100

## **Duration: 3 Hours**

# PART A

	Answer all questions, each carries 3 marks.	Marks
1	Write short notes Energy Conservation Building Codes.	(3)
2	Enumerate three general principles of energy management.	(3)
3	Compare any three light sources in terms of life span and efficacy.	(3)
4	What are the different types of losses that occur in a transformer?	(3)
5	What is time-of-day pricing?	(3)
6	Enumerate different methods that can be used to improve power factor.	(3)
7	What is Coefficient of Performance of a HVAC System?	(3)
8	List out different types of Cogeneration Systems.	(3)
9	Write short notes on Computer Aided Management Systems.	(3)
10	Explain time value of money.	(3)

#### PART B

Answer any one full question from each module, each carries 14 marks.

#### Module I

11	a)	Discuss how to conduct a detailed energy audit.		
	1 >		(7)	

 b) What is an Energy Audit Report? Outline the general format of an Energy Audit (7) Report.

#### OR

12	a)	List out different instruments used for energy audit. Explain the features of any	(7)
		three such instruments.	
	b)	Explain the need for power quality audit. How can it be carried out?	(7)
		Module II	
13	a)	Define cascade efficiency. How can it be improved?	(7)
	b)	Elucidate on design measures that can be adopted to improve the efficiency of	(7)

b) Elucidate on design measures that can be adopted to improve the efficiency of (7) motors.

#### OR

14	a)	Discuss different methods to reduce energy consumption in lighting.	(7)
	b)	Elaborate on design measures that can be implemented to enhance the efficiency	(7)
		of transformers	

## Module III

- 15 a) What is Demand Side Management? Explain how can it be implemented. (7)
  - b) What are ancillary services in power systems? Explain the different types of (7) services.

# OR

- 16 a) How can load management be implemented in power systems? (7)
  - b) A consumer takes a load of 900 kW at 0.65 pf lagging. The tariff is Rs 1000 per (7) kVA of maximum demand annually plus 80 paise per kWh. The cost of installation of the power factor correction equipment is Rs 2000 per kVAr. The annual interest and depreciation is 15%. Determine (a) The most economical pf (b) The kVAr rating of the power factor correction equipment to improve the pf to this value.

#### Module IV

17	a)	Explain how energy conservation can be carried out in boilers.	(7)
	b) ·	Identify the energy conservation opportunities in steam distribution.	(7)
		OR	
18	a)	How can energy be saved in a furnace system?	(7)
	b)	Explain any two types of waste heat recovery system.	(7)
		Module V	

- a) Explain the steps involved in life cycle costing approach for the selection of (10)
  energy projects.
  - b) A cogeneration system installation is expected to reduce a company's annual (4) energy bill by Rs. 23 Lakhs. If the capital cost of the new generation installation is Rs. 90 Lakhs and the annual maintenance and operating costs are Rs. 5 Lakhs, what will be the expected payback period for the project?

#### OR

20 a) Briefly explain Internal Rate of Return and Average Rate of Return method for (4) economic analysis of energy projects.

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b) Using present value analysis techniques, evaluate which of these financial project (10) is meritorious. Assume an annual discount rate of 8% for each project.

	Project 1	Project 2
Capital Cost	30,000	30,000
Year	Net Annual Savings (Rs.)	Net Annual Savings (Rs.)
1	+ 6000	+ 6600
2	+ 6000	+ 6600
3	+ 6000	+ 6300
4	+ 6000	+ 6300
5	+ 6000	+ 6000
6	+ 6000	+ 6000
7	+ 6000	+ 5700
8	+ 6000	+ 5700
9	+ 6000	+ 5400
10	+ 6000	+ 5400
Total Net Savings at the end of Year 10	60000	60000

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