

Reg. No.

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B.E / B.TECH. DEGREE EXAMINATION, MAY 2023

Eighth Semester

CH18014 – ENERGY MANAGEMENT IN CHEMICAL PROCESS INDUSTRIES*(Chemical Engineering)***(Regulation 2018)**

TIME:3 HOURS

MAX.MARKS: 100

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Evaluate the concepts of energy management program.	5
CO 2	Identify the energy management technologies in heat transfer equipments.	3
CO 3	Apply the energy management techniques in steam utility systems.	3
CO 4	Infer the energy management techniques in other common utility systems.	5
CO 5	Interpret the energy management concepts and applications in process.	5

PART- A(10x2=20Marks)

(Answer all Questions)

	CO	RBT LEVEL
1 Identify the key components of an energy management program.	1	2
2 List a few energy management standards implemented successfully.	1	1
3 Define: Thermal efficiency in boilers.	2	2
4 Sketch the temperature profile for any two types of heat exchangers.	2	2
5 Mention the focus areas of an effective steam trap management program.	3	2
6 Differentiate: Steam trap and vent.	3	2
7 Give examples for major rotating machinery in process industries.	4	1
8 Indicate the significance of lighting in industries.	4	2
9 Categorize a few process improvements for better energy efficiency.	5	2
10 Highlight the necessity for energy dashboards.	5	2

PART- B (5x 14=70Marks)

(Restrict to a maximum of TWO subdivisions)

	Marks	CO	RBT LEVEL
11(a) Explain the circular process of energy management in detail with a specific case study.	(14)	1	3

(OR)

11(b)	Explain the people resources involved in creating the opportunities for improving energy efficiency indicating their roles and responsibilities in a process industry.	(14)	1	3
12(a)	Elaborate the various operations involved in maintenance of furnace components for peak efficiency.	(14)	2	4
(OR)				
12(b)	Analyze the design parameters to be considered in heat exchangers to attain the maximum benefits of energy enhancement technologies.	(14)	2	4
13(a)	Identify the issues that are to be addressed for a successful steam leak management program and explain the same.	(14)	3	3
(OR)				
13(b)	Explain in detail, the costs involved in marginal steam pricing with a neat diagram.	(14)	3	3
14(a)	Explain in detail about the component related opportunities available to achieve energy efficient refrigeration.	(14)	4	3
(OR)				
14(b)	List the various industrial insulation types and analyze their applications with examples.	(14)	4	3
15(a)	Evaluate various ideas that can be utilized for optimizing fuel gas disposition.	(14)	5	3
(OR)				
15(b)	Explain about the choice of key Energy performance indicators and their significance in process industries.	(14)	5	3

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16	Develop a neat flow diagram to explain a detailed methodology for an efficient energy management in any one process industry.	(10)	5	5
