

Total Marks: 70

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

			MARKS
Q.1	(a)	Define energy conservation with suitable example	03
	(b)	List four important duties of energy manager in industry as per Energy conservation act-2001.	04
	(c)	Define energy security. Enlist different strategies to achieve it and discuss role of energy conservation to achieve energy security.	07

Q.2	(a)	Define following terms. 1. Power Factor 2. Load Factor 3. Energy Intensity	03
	(b)	State and explain the factors that influence thermal performance of the buildings.	04
	(c)	Explain sensitivity analysis and list the micro and macro factors.	07

Q.3	(c)	Give name and use of different energy audit instruments.	07
	(a)	Define the terms: SPP, ROI, NPV	03
	(b)	Explain the role of Energy service companies. (ESCOs.)	04
	(c)	Calculate the internal rate of return for the following cash flow of a project.	07

Year	0	1	2	3	4
Cash flow	(100,000)	30,000	30,000	40,000	45,000

Q.3	(a)	Define the terms: IRR, Cash flow, Risk analysis	03
	(b)	What do you mean by Payback period?	04
	(c)	Use CUSUM technique and calculate energy savings for 6 months period of 2017. For calculating total energy savings, average production can be taken as 4000MT/Month. Refer data given in table below.	07

2017-Month	Actual-SEC, Kwh/MT	Predicted SEC-Kwh/MT
Jan	242	265
Feb	238	265
Mar	287	265
Apr	237	265
May	295	265
Jun	246	265

Q.4	(a)	Define energy audit. Identify its needs.	03
	(b)	Explain the TOD (time of the day) tariff and its importance.	04
	(c)	Discuss the sources of waste heat and its potential applications.	07

Q.4 (a) List the benefits of heat recovery system. **03**

	(b)	List the energy saving opportunities in refrigeration Air-conditioning plant area.	04
	(c)	Define and explain following terms (i) Plant energy performance (ii) Production factor (iii) Reference year equivalent energy use	07
Q.5	(a)	List the various types of heat losses in furnace.	03
	(b)	Explain the following : (i) Reactive power and Active power (ii)	04
	(c)	What are co-generation plants? Explain the difference between bottoming and topping cycle co-generation plants.	07
		OR	
Q.5	(a)	Give tips for energy saving in pumps	03
	(b)	Differentiate Energy Conservation and Energy Efficiency with suitable example.	04
	(c)	Explain Clean Development Mechanism (CDM).	07
