

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3161919****Date:01-06-2026****Subject Name: Energy Conservation and Management****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- | | MARKS |
|--|---------------|
| Q.1 (a) Define: Energy Audit, Designated Consumers, ESCOs | 03 |
| (b) Discuss Sector wise Indian energy scenario. | 04 |
| (c) What is CDM? Write a note on CDM Methodology and its project cycle with neat sketch. | 07 |
|
Q.2 (a) List the missions under the National Action Plan for the climate change. |
03 |
| (b) Explain Blow down, its necessity and its advantages. | 04 |
| (c) Enlist the schemes of BEE under the Energy Conservation act 2001 and discuss any two schemes in detail. | 07 |
| OR | |
| (c) Discuss the salient features of Energy Conservation Act - 2001 | 07 |
|
Q.3 (a) List out the objectives of energy management. |
03 |
| (b) Explain energy conservation and its importance by giving an example. | 04 |
| (c) Discuss the steps for detailed energy audit. | 07 |
| OR | |
| Q.3 (a) Define the plant energy performance, Efficiency of the boiler, Heat Exchanger effectiveness. | 03 |
| (b) Enlist the energy audit instruments and explain the use of combustion gas analyzer. | 04 |
| (c) Discuss the Energy conservation opportunities for Boiler in detail. | 07 |
|
Q.4 (a) Define Pay back period, Return on investment, Net present Value |
03 |
| (b) Discuss any four key elements of monitoring and targeting. | 04 |
| (c) Using the net present value analysis technique, evaluate the financial merits of the two proposed projects shown in the table below: The annual discount rate is 8.5% for each project. | 07 |

	Project 1	Project 2
Capital cost (Rs.)	25000	25000
Year	Net Annual Savings (Rs.)	Net Annual Savings (Rs.)
1	+7000	+6500
2	+6000	+7500
3	+6500	+7000
4	+6500	+7000
5	+5500	+5500

6	+7500	+5500
Total Savings at the end of the 6 th year	+39000	+39000

Also state the advantages of the Net present value method used.

OR

- Q.4** (a) What is EMIS? State its advantages. **03**
 (b) Write a note on Cash flows. **04**
 (c) The energy production data (for Jan-April, 2015) of an industry follows a relationship: **07**

Calculated Energy consumption = $0.5P + 220$.

A heat recovery system was installed at the end of April 2015, and further data was gathered up to December, 2015.

Using CUSUM technique, calculate energy savings in terms of ton of oil equivalent (toe) and the reduction in specific energy consumption achieved with the installation of waste heat recovery system. This plant data is given in the table below:

2015 - Month	Actual Energy Consumption, toe/month	Actual Production, Ton/month
May	530	620
June	540	670
July	590	760
Aug	605	820
Sept	670	940
Oct	582	750
Nov	540	610
Dec	540	670

- Q.5** (a) Explain Deaeration treatment for the boiler water. **03**
 (b) What is steam traps? State its functions and benefits of providing steam traps in a steam system. **04**
 (c) Discuss various losses in the fuel fired furnaces in detail. **07**

OR

- Q.5** (a) What is topping cycle and bottoming cycles of cogeneration. **03**
 (b) Write a short note on economic thickness of insulation and factors to be considered while calculation of the same. **04**
 (c) State various types of waste heat recovery devices. Explain working of any one waste heat recovery device with neat sketches. **07**
