

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VIII (NEW) EXAMINATION – WINTER 2020****Subject Code:2181916****Date:19/01/2021****Subject Name:Energy Conservation And Management****Time:02:00 PM TO 04:00 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**MARKS**

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|------------|-----|--|-----------|
| <b>Q.1</b> | (a) | Explain the following terms: Sectorial energy consumption, energy intensity, energy pricing.   | <b>03</b> |
|            | (b) | Briefly explain various schemes relating to Bureau of Energy Efficiency (BEE) for designated consumers, State designated agencies.   | <b>04</b> |
|            | (c) | A plant has 4 electroplating process tanks of total capacity of 2000 liters, where hot water at 75 °C is used for process, make up water requirement for four tanks is around 1000 liters per day. During the week end tanks will be cleaned and it will be topped up with fresh water 25 °C of 2000 liters, The plant has planned to switch over from electrical heating to solar water heating for make up water requirement. Cost of electricity for the plant is Rs 5.15 per kWhr. Solar water heating system supplier guaranteed make up water can be heated up to 75 °C. If the cost of solar water heater is Rs 250,000 for 1000 liters capacity evaluate the simple payback period taking 300 days process operations. | <b>07</b> |
| <b>Q.2</b> | (a) | Write brief note on critical thickness of Insulation.  | <b>03</b> |
|            | (b) | Distinguish between energy conservation and energy Management.   | <b>04</b> |
|            | (c) | Briefly explain how energy audit is carried in a thermal power plant. How is the audit report prepared?  | <b>07</b> |
| <b>Q.3</b> | (a) | Explain energy conservation Act 2001 and its features, notifications under the Act.  | <b>03</b> |
|            | (b) | Write brief note on ECBC code for Building Construction.   | <b>04</b> |
|            | (c) | Classify waste heat recovery devices and potential of generating energy from it.   | <b>07</b> |
| <b>Q.4</b> | (a) | Explain techniques of bench marking for maximizing system efficiency with examples.  | <b>03</b> |
|            | (b) | Discuss the role of Energy Service Companies for financial management.   | <b>04</b> |
|            | (c) | List application, advantages of Thermic fluid heaters and super critical boilers from energy conservation point of view.   | <b>07</b> |
| <b>Q.5</b> | (a) | List various instruments used for carrying out energy audit.   | <b>03</b> |
|            | (b) | Briefly explain Ice bank system from energy conservation point of view.  | <b>04</b> |
|            | (c) | Explain techniques of energy conservation in refrigerated cold storage plants.   | <b>07</b> |

- Q.6** (a) Explain Indian strategy of energy saving for future. **03**  
(b) Define the terms: Return on Investment, Net present value, Internal rate of return, Time value of money **04**  
(c) Compare direct and indirect method of calculating boiler efficiency, list step wise procedure for calculating boiler efficiency. **07**
- Q.7** (a) Explain method of selection and application of refractories. **03**  
(b) Explain the terms: Sustainable development, Kyoto Protocol. **04**  
(c) List various opportunities for energy savings in steam piping systems. **07**
- Q.8** (a) How is bachat lamp yojna implemented and its effect on related industries? **03**  
(b) Explain briefly: clean development mechanism, prototype carbon fund. **04**  
(c) Explain heat balance of forging furnace and its performance evaluation from energy conservation point of view. **07**

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