

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. Sem. – IInd - Examination – June/July- 2011****Subject code: 1721107****Subject Name: Energy conservation & Management****Date: 01/07/2011****Time: 10:30 am – 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.

- Q.1** (a) Explain (1) Energy cost (2) Bench marking in relation to energy audit. **07**
 (b) What is waste heat recovery and explain heat pipe with neat sketch? Also state application of it. **07**

- Q.2** (a) What are the methods to store the energy? Discuss any two. **07**
 (b) Enlist the types and need of energy audit and explain detailed energy audit **07**

OR

- (b) State the methods used to evaluate the performance of the boiler and explain indirect method to evaluate the boiler. **07**

- Q.3** (a) Why water treatment is necessary in boiler? Discuss reverse osmosis used for boiler feed water. **07**
 (b) What is the function of steam trap? Explain any two steam traps with neat sketch. **07**

OR

- Q.3** (a) Discuss energy conservation opportunities in boiler. **07**
 (b) Explain the performance assessment methods for steam traps. **07**

- Q.4** (a) Explain the term Co-generation and why it is needed? Classify co-generation cycles and explain bottoming cycle with neat sketch and suitable examples. **07**
 (b) In a sugar manufacturing industry, the main cooling tower operates at its 30% capacity for main power plant. The rated cooling water flow is 5000m³/hr. two cooling water pumps having 7.5 kW rating are in operation continuously with 50% of its rated capacity. A separate cooling tower is also operating for DG set operation continuously. The DG set cooling water flow is 240 m³/hr. for this; two fans are also in operation of 22kW rating. The power requirement for separate DG set cooling tower is 7 kW. Suggest the tips for energy saving and justify it. **07**

OR

- Q.4** (a) Define (1) power factor (2) synchronous speed (3) slip (%) (4) PEP (5) Pay back period (6) % blow down (7) square engine. **07**
 (b) State the types of different prime movers used in co-generation explain any two with neat sketch. **07**

- Q.5** (a) State and Discuss the different parameters used to measure the performance of IC engine. **07**
 (b) Write a note on the automatic power factor controllers **07**

OR

- Q.5** (a) Explain different energy conservation techniques can be used for Internal combustion engines? **07**
 (b) Discuss the need for electrical load management. Explain step by step approach for maximum demand control. **07**
