No. of Printed Pages : 3

**OEY-003**

# CERTIFICATE IN ENERGY TECHNOLOGY AND MANAGEMENT (CETM)

00855

## Term-End Examination

## June, 2012

## OEY-003 : ENERGY MANAGEMENT : AUDIT AND CONSERVATION

*Time : 3 hours* *Maximum Marks : 70*

***Note :*** *Attempt **any ten** questions. All questions **carry equal** marks.*

1. (a) Define the basic concept of preliminary energy audit. **3+4=7**

   (b) If 100 W bulb is left switched on for 2 hrs daily and the cost of the electricity is Rs. 4/kWh, determine the annual cost of electricity wasted.

2. (a) List the most widely measured electrical parameters. **3+4=7**

   (b) Define power factor and discuss its importance.

3. (a) Describe at least 3 devices to measure pressure. **4+3=7**

   (b) Discuss the energy conservation measures in lighting.

4. The energy audit data of an oil mill are the following : 7

Annual production = 2000 tonne
Annual cost of electricity used = Rs. 8 lakh.
Annual cost of furnace oil used = Rs. 5 lakh.
Annual cost of diesel oil used = Rs. 2 lakh.
The energy conservation measures result up to 20% savings in electricity, furnace oil, diesel oil individually. Determine specific energy consumption before and after the implementation of energy conservation measures.

5. Discuss the basic steps for developing electrical energy balance by taking an example. 7

6. (a) How energy conservation helps in improving the environment ? 3+4=7

(b) The operating power factor during audit is 0.7. Total connected load is 180 kW. Determine the rating of power capacitors for improving the power factor to 0.95.

7. (a) Discuss the present worth method for energy conservation measures. 3+4=7

(b) An energy auditor proposes the following two measures :

**Measure 1** : The equipment cost is Rs. 20,000 and pays back Rs. 15,000 in two years.

**Measure 2** : The equipment cost is Rs. 15,000 and pays back Rs. 8,000 per year for two years.

Determine the best alternative for interest rate as 10%.

8. Discuss energy conservation measures in Boilers. 7

9. Discuss energy conservation measures in steel industry. 7

10. Discuss the energy conservation measures in motors. 7

11. Write short notes on the following : 4+3=7
    (a) Energy Management
    (b) Evaporative Cooling

12. What is meant by waste heat recovery ? How waste heat recovery is done in a diesel engine ? 4+3=7