

**CERTIFICATE IN ENERGY TECHNOLOGY
AND MANAGEMENT (CETM)**

Term-End Examination

June, 2019

00991

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

Time : 3 hours

Maximum Marks : 70

Note : Attempt any seven questions. All questions carry equal marks. Use of scientific calculator is permitted. Assume suitable data, if missing.

1. Explain the need of Energy Audit. Enlist energy rating of any five devices used in your home. 10
2. Discuss the utility of electrical measuring instruments with example. 10
3. Explain the methodology to conduct energy audit of your home. 10
4. Explain various important measures to conserve energy from an air-conditioning unit. 10

5. What is evaporative cooling ? How is it better than air-conditioning ?

10

6. A solar PV array of 200 W has been installed to pump water from borewell of 5 m depth using a submersible motor and pump system to an overhead tank. The length of pipe required to pump the water is 20 m. Following are the costs involved for the subsystems and their life spans :

PV array : ₹ 500/peak W; Life = 15 years

Motor and Pump : ₹ 100/W; Life = 7.5 years

Pipe cost : ₹ 500/m; Life = 5 years

Cost of digging the borewell = ₹ 600/m

Maintenance cost : ₹ 5000/year

Miscellaneous costs : ₹ 500/W

Interest = 10%

Determine the life cycle cost of the water for 20 years.

10

7. A 9.20 kW motor was found to be working with 50% load. What could be the right size of energy efficient motor, energy saved and payback period if the motor is working 20 hrs/day and 300 days/year ? The cost of electricity is ₹ 5/kWh. Assume that the cost of motor replaced is ₹ 15000 and is 92% efficient.

10

8. Explain various energy efficient lighting devices in brief. 10
9. How does the reduction in contract demand help in conservation in Vanaspati Industry ? 10
10. Write short notes on any *two* of the following : $2 \times 5 = 10$
- (a) Integrated Rural Energy Planning
 - (b) Energy Balance
 - (c) Coefficient of Performance (COP)
 - (d) Gasifier Based Engine Pump
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