

CODE NO: NR420203 NR

## 2006 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS  
ENERGY MANAGEMENT

(ELECTRICAL & ELECTRONIC ENGINEERING)

APR/MAY 2006

Time: 3 hours  
Max Marks: 80

---

Answer any FIVE Questions  
All Questions carry equal marks

1. (a) List out the concepts of Energy management and show how it fits with the principles of Energy management. [10]  
(b) Discuss the various phases that exist in an energy management program [6]
2. (a) Discuss about the level of Responsibility in a company to conserve energy. [10]  
(b) Consider a company using three energy forms Oil, Gas and Electricity. The annual energy consumption is shown in table in various energy units find percentage energy balance. Assume  
 $1 \text{ Joule} = 947 \times 10^{-6} \text{ btu} = 238.8 \times 10^{-6} \text{ calories} = 9.478 \times 10^{-9} \text{ therm} = 2778 \times 10^{-6} \text{ wh}$   
 $1 \text{ Joule} = 5.6497 \times 10^{-9} \text{ gal.}$   
Energy Type Consumption  
Oil  $10 \times 10^3 \text{ gal}$   
Gas  $5 \times 10^3 \text{ therm}$   
Electricity  $995 \times 10^3 \text{ kwh}$  [6]
3. (a) Briefly explain the importance of energy conservation [8]  
(b) List out the steps required for an energy conservation programme [8]
4. (a) Briefly explain the causes of low power factor. [6]  
(b) Explain energy efficient electric motors . [10]
5. Explain the functions of energy manager . Prepare a Questionnaire for conducting energy audit of a medium scale Industry of your choice. [16]
6. What is meant by time value of money? Calculate the depreciation rate using the Straight-line method, sum of years digit method for the asset with salvage value zero. Life of asset 5 years. Cost Rs 1,80,000. For decline balance method use 40% rate. [6+10]
7. What are the situations, which make the replacement of items necessary? The cost of a machine is Rs 6100 and its scrap value is only Rs.100. The maintenance cost are found from experience to be:  
Year Maintenance: 1 2 3 4 5 6 7 8 Cost in Rs. : 100 250 400 600 900 1250 1600 2000  
When should be the machine be replaced.
8. (a) Discuss the importance of planning and leading an energy management program in an organization.  
(b) Discuss the functions of an energy manager in initiating and managing an energy management program with particular reference to planning, Leading and controlling.