

Roll No: -----



## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2019

Program: MBA (Power Management)  
Subject (Course): Energy Conservation and Audit  
Course Code : PIPM 8004  
No. of page/s: 2

Semester – III  
Max. Marks: 100  
Duration : 3 Hrs

---

### Section – A (2 marks \* 10 = 20 Marks)

Fill in the blanks with the most suitable words/figures. Correct filling of each blank will fetch 2 marks. (CO1, CO2)

1. Replacement of a CFL with an LED is an example of energy \_\_\_\_\_.
2. Saving energy through a behavioral change is classified under energy \_\_\_\_\_.
3. The process of \_\_\_\_\_ of energy usage for the same amount of production or activity is called Energy Management.
4. Energy Management involves operating \_\_\_\_\_ to rated capacity, \_\_\_\_\_ maintenance of equipment, replacing older equipment with \_\_\_\_\_ efficiency ones, \_\_\_\_\_ waste heat and utilization of renewable energy.
5. As per Energy Conservation Act 2001, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ industries are classified as energy intensive industries.

### Section – B (5 marks \* 4 = 20 Marks)

Answer all questions in this section: (CO2)

6. Briefly explain the following:
  - a) Energy Conservation Building Codes
  - b) Energy Audit
  - c) Retrofitting
  - d) Demand Ratchet

**Section – C (10 marks \* 3 = 30 Marks)**

**Answer any three questions from this section:**

**(CO2, CO3)**

7. Enlist the phases and activities involved in an Energy Audit.
8. Highlight the core functions of BEE.
9. One unit of electrical energy saved at the consumer end is equivalent to approximately four units of energy contributed to the nation. Justify using appropriate values.
10. In some cases that involve innovative project financing, organizations have reaped the benefits of energy management without investing anything. Justify citing an example.

**Section – D (30 marks \* 1 = 30 Marks)**

**Answer any one question from this section:**

**(CO3, CO4)**

11. To meet energy demand-supply gap, compare Energy Management as a strategic option versus the strategy of increasing energy supply. Assuming yourself as a policymaker, suggest two innovative policy measures that can be used for promoting energy management in India.

OR

12. Consider a 50 hp motor that is driving a centrifugal pump at full speed continuously throughout a year. The price of electricity is Rs 5.00/kWh. Since this particular pump accommodates a varying load, the pump does not need to be run at full speed throughout the year and therefore, a variable frequency drive can be employed to reduce the pump motor speed. The pump load schedule is: 20% of the time at 50% full speed; 50% of the time at 80% full speed; and 30% of the time at 100% full speed. Estimate annual savings (in %) with implementation of a variable frequency drive.

Hint: 1 hp = 0.746 kW ;  $(P_2/P_1) = (N_2/N_1)^3$

---