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Name :	
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Invigilator's Signature :	

CS/B.Tech(EE)/SEM-8/EE-801C/2013 2013

ENERGY MANAGEMENT AND AUDIT

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words

as far as practicable.

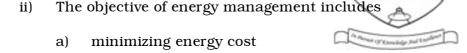
GROUP - A

(Multiple Choice Type Questions)

- 1. Choose the correct alternatives for any ten of the following questions: $10 \times 1 = 10$
 - i) What happens if supply voltage across a lighting installation is increased by 20%?
 - a) Energy consumption decreases
 - b) Frequency is increased
 - c) Energy consumption increases
 - d) Energy consumption remains unaltered.

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- b) minimizing waste
- c) minimizing environmental degradation
- d) all of these.
- iii) The percentage of energy saved at the current rate of use, compared to the reference year rate of use, is called
 - a) energy utilization
 - b) energy performance
 - c) energy efficiency
 - d) none of these.
- iv) Which fuel dominates the energy mix in Indian energy scenario?
 - a) Oil

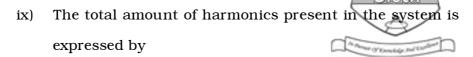
- b) Coal
- c) Natural gas
- d) Nuclear.
- v) Which of the following is the function of series capacitors installed in a 220 kV, 50 Hz, three phase 750 MVA transmission line?
 - a) Reduction of inductive reactance
 - b) Reduction of capacitive reactance
 - c) Improvement of power factor
 - d) Reduction of impedance.

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- vi) Which of the following is accounted as running changes for working out electricity tariff of a supply company?
 - a) Insurance
 - b) Operation and maintenance cost
 - c) Wages of operating employees
 - d) Dividend declared by the company.
- vii) Which of the following is co-generation?
 - a) Power plant run by pulverized coal
 - b) Power plant run by exhaust gas from gas turbine
 - c) Power plant run by plant waste
 - d) None of these.
- viii) Which of the following is highest contributor to the air pollution?
 - a) Suspended particles b) Sulphur dioxide
 - c) Carbon dioxide d) Carbon monoxide.

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- a) ripple factor
- b) total harmonic ratio
- c) total harmonic factor
- d) total harmonic distortion.
- x) Acid rain is caused by the release of which of the following components from combustion of fuels?
 - a) SO_x and NO_x
 - b) SO_x and CO_2
 - c) CO_2 and NO_x
 - d) SO_x and CO.
- xi) Which of the following can improve load factor of an electrical system?
 - a) Increased average load
 - b) Decreased average load
 - c) Increased maximum load
 - d) Increased maximum demand.



- xii) Which of the following is termed as "time of the day" scheme?
 - a) Offering cheap power during a specific off peak load period
 - b) Offering cheap power during peak load period
 - c) Offering cheap power at night
 - d) Offering cheap power at day.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following.

 $3 \times 5 = 15$

- 2. Why maximum demand need to be controlled? What are the options available to control maximum demand?
- 3. What are the base line data that an audit team should collect while conducting detailed energy audit?
- 4. What is ATC loss? What actions may be taken to minimize the ATC loss?
- 5. What are the impacts of global warming?
- 6. An industry has a connected load of 200 kW. The maximum demand is 170 kW. On an average, each machine works for 65% time. The tariff system includes a fixed change of Rs. 1,100 per year, a maximum demand charge of Rs. 125 per kW and an energy charge of Rs. 6·15 per kWh. Find the yearly expenditure of the industry on electricity.

GROUP - C



(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

- 7. What are the objectives of energy management? Write down the responsibilities and duties of an energy manager. How is environment related to energy management? 4 + 7 + 4
- 8. a) What is biomass?
 - b) Explain the principle of production of Biogas.
 - c) Discuss the principle and working of tidal wave energy conversion system. 2 + 5 + 8
- 9. a) Why is energy conservation necessary?
 - b) Briefly mention the provisions of Energy Conservation Act, 2001.
 - c) What is meant by "carbon credit"? 4 + 8 + 3
- 10. a) What is energy audit? Mention its scope.
 - b) Discus in detail the various types of energy audit.

5 + 10

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11. Write short notes on any three of the following:

- a) Strategy for the future energy sources in India
- b) Electricity Tariffs
- c) Photovoltaic cell
- d) Bench marking
- e) Load management.

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