Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS / B.TECH (EE-NEW)/ SEM-8 / EE-801C / 2011

2011

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 : $10 \times 1 = 10$

i) Environmental impact of coal based generation is

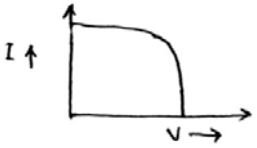
a) ash

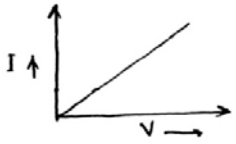
b) stack products (SO_2, NO_X, CO, CO_2)

c) submerged land

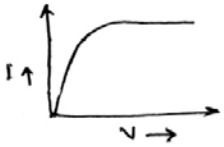
d) both (a) and (b).

ii) The V.I. characteristic of a solar cell is

a) 

b) 

c) 

d) 

iii) Low grade fuels have

a) low ash content b) low calorific value

c) low carbon content d) low moisture content.

iv) Salient feature of Energy Conservation Act 2001 is

a) establishment of Bureau of Energy Efficiency

b) to prescribe energy conservation building codes for all buildings

c) to specify energy consumption standard

d) both (a) and (c).

v) Sourcewise contribution to installed power generation capacity (in MW) as on 31-09-2010 is

a) Thermal - 64%, Hydro - 22·4%, Nucleur - 2·7%, Renewable - 10·9%

b) Thermal - 50%, Hydro - 25%, Nucleur - 10%, Renewable - 15%

c) Thermal - 90%, Hydro - 5%, Nucleur - 1%, Renewable - 4%

d) Thermal - 30%, Hydro - 60%, Nucleur - 5%, Renewable - 5%.

vi) The aggregate technical and commercial (AT&C) loss of India for 2008-09 was

a) 40% b) 50%

c) 10% d) 28·44%.

vii) Waves are created by gravitational action of

a) the sun b) the moon

c) both (a) and (b) d) the earth.

viii) Improvement of power factor helps in reduction of

a) reactive power b) active power

c) apparent power d) both (a) and (c).

ix) In ocean thermal energy conversion
   a) the thermal gradient is converted into electrical energy
   b) the velocity gradient is converted into electrical energy
   c) the height gradient is converted into electrical energy
   d) all of these.

x) A plant load factor is a measure of
   a) average capacity utilization
   b) maximum capacity utilization
   c) installed capacity utilization
   d) captive capacity utilization.

xi) The efficiency of windmill is a function of
   a) the rotor diameter
   b) the density and volume of air
   c) the velocity of air
   d) all of these.

xii) Biogas is the gaseous product consisting of
   a) methane b) carbon dioxide
   c) nitrogen d) both (a) and (b).

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) List the objectives of energy management.
   b) State the importance of energy policy for industries. 2 + 3

3. a) What is an energy audit ?
   b) What are the benefits of benchmarking energy consumption ? 2 + 3

4. Describe the principle of solar photovoltaic energy conversion.

5. Explain how global warming is linked with energy production.

6. a) What is meant by "load management" ?
   b) How can it be achieved ? 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Explain briefly the difference between preliminary and detailed energy audit.

   b) Discuss different steps for detailed energy audit in an academic institute. 5 + 10

8. Discuss energy management for electrical systems with emphasis on system components, controlling of energy cost, power quality and reliability.

9. a) Discuss in your own words, how can the energy need of growing economy like India be solved.

   b) Explain the importance of energy conservation.

   c) Mention any scheme for energy conservation at your institute. 7 + 3 + 5

10. a) What is meant by renewable energy sources ?

    b) Explain the principle of extraction of energy from wind, geothermal and Bio to overcome energy crisis. 3 + 12

11. Write short notes on any *three* of the following : 3 × 5

    a) Optimization of energy requirement

    b) Energy sector reforms

    c) Aggregated technical & commercial losses

    d) Electricity tariff

    e) Energy Conservation Act, 2001.

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