



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)

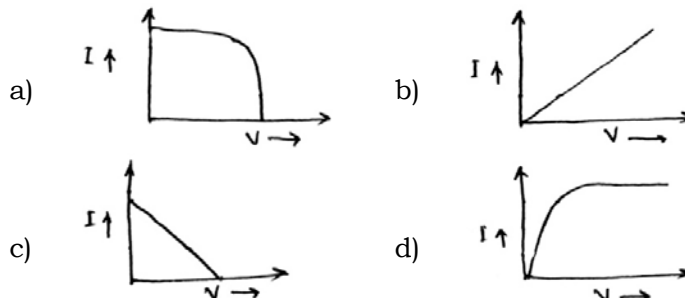
1. Choose the correct alternatives for any *ten* of the following :

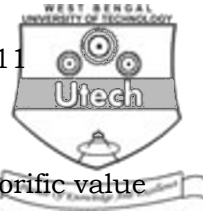
10 × 1 = 10

- i) Environmental impact of coal based generation is

- a) ash
- b) stack products (SO₂, NO_x, CO, CO₂)
- c) submerged land
- d) both (a) and (b).

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





- 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%, Nuclear - 2.7%, Renewable - 10.9%
 - b) Thermal - 50%, Hydro - 25%, Nuclear - 10%, Renewable - 15%
 - c) Thermal - 90%, Hydro - 5%, Nuclear - 1%, Renewable - 4%
 - d) Thermal - 30%, Hydro - 60%, Nuclear - 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).



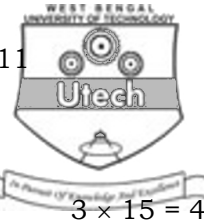
- ix) In ocean thermal energy conversion
 - a) the thermal gradient is converted into electrical energy
 - b) the velocity gradient is converted into electrical energy
 - c) the height gradient is converted into electrical energy
 - d) all of these.
- x) A plant load factor is a measure of
 - a) average 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.

$3 \times 15 = 45$

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.

=====