



- g) Multi-meter.
  - h) Power Anal zero
- (4) The benchmark parameters can be:
- ~ Scale of operation
  - ~ Vintage of technology
  - ~ Raw material specifications and quality
  - ~ Product specifications and quality
  - ~ Gross production related
  - ~ E u i ment / utilit related
- (5) The harmful effects of global warming are-
- a) Melting of Glaciers
  - b) Climate Change
  - c) Rise in Droughts
  - d) The rise of Sea Levels
  - e) Diseases
  - f) Hurricanes Frequency
  - g) Effect on Agriculture
  - h) Unex ected Heat Waves

Q.3 Attempt any two

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- (2) The five steps involved in detailed energy audit.

(2) The various types of energy audit-

- ~ Preliminary Energy Audit (Walk-through audit)- In a preliminary energy audit, readily-available data are mostly used for a simple analysis of energy use and performance of the plant. This type of audit does not require a lot of measurement and data collection. These audits take a relatively short time and the results are more general, providing common opportunities for energy efficiency.
- ~ Detailed Energy Audit (Diagnostic Energy Audit). For detailed energy audits, more detailed data and information are required. Measurements and a data inventory are usually conducted and different energy systems (pump, fan, compressed air, steam, process heating, etc.) are assessed in detail. Hence, the time required for this type of audit is longer than that of audits.

(3) The reporting format of detailed energy audit-

Q.4 (A) Compulsory

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Commercial energy

Commercial energy is energy which is available to the users at some price.

For example, coal, petroleum, natural gas and electricity.

It is used for commercial purposes in factories and farms.

This is a non-renewable form of energy.

Non-commercial energy

Non-commercial energy is energy which is available free of cost to the users.

For example, fire wood, agricultural waste, cow dung.

It is used for domestic and consumption purposes.

It is a renewable form of energy.

(B) The Greenhouse effect-

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A greenhouse is a house made of glass that can be used to grow plants. The sun's radiations warm the plants and the air inside the greenhouse. The heat trapped inside can't escape out and warms the greenhouse which is essential for the growth of the plants. Same is the case in the earth's atmosphere.

During the day the sun heats up the earth's atmosphere. At night, when the earth cools down the heat is radiated back into the atmosphere. During this process, the heat is absorbed by the greenhouse gases in the earth's atmosphere.

The major contributors to the greenhouse gases are factories, automobiles, deforestation, etc. The increased number of factories and automobiles increases the amount of these gases in the atmosphere. The greenhouse gases never let the radiations escape from the earth and increase the surface temperature of the earth. This then leads to global warming.

The major causes of the greenhouse effect are:

- ~ Burning of Fossil Fuels- Fossil fuels are an important part of our lives. They are widely used in transportation and to produce electricity. Burning of fossil fuels releases carbon dioxide. With the increase in population, the utilization of fossil fuels has increased. This has led to an increase in the release of

- ~ Deforestation- Plants and trees take in carbon dioxide and release oxygen. Due to the cutting of trees, there is a considerable increase in the greenhouse gases which increases the earth's temperature.
- ~ Farming- Nitrous oxide used in fertilizers is one of the contributors to the greenhouse effect in the atmosphere.
- ~ Industrial Waste and Landfills- The industries and factories produce harmful gases which are released in the atmosphere. Landfills also release carbon dioxide and methane that adds to the greenhouse gases.

OR

(B) Energy security- It is defined as the uninterrupted availability of energy sources at an affordable price. Long-term energy security deals with timely investments to supply energy in line with economic developments and environmental needs. Short-term energy security focuses on the ability of the energy system to respond promptly to sudden changes in the supply-demand balance.

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- a) Increasing accessibility to clean energy,
- b) Enhancing efficiency,
- c) Policy changes,
- d) Infrastructure.

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