

TRUE/FALSE

1. Coal-burning power plants are the predominant source of electricity generation in the U.S.

ANS: T PTS: 1 REF: Electricity - The Essential Power

2. The total asset value of electrical facilities in the U.S. is around \$8 billion and the industry's annual sales are around \$3 billion, according to the U.S. Department of Energy.

ANS: F PTS: 1 REF: The Traditional Electric Grid

3. An efficient and safe method of meeting peak demands needs is to transport power into the high demand area from another part of the grid where demand is lower.

ANS: F PTS: 1 REF: The Traditional Electric Grid

4. The generating capacity of the smart grid is decentralized.

ANS: T PTS: 1 REF: What is the Smart Grid?

5. A smart meter is the only device required to make a smart grid home more energy efficient.

ANS: F PTS: 1 REF: The Home Smart Grid

COMPLETION

1. Natural gas plants and _____ each produce about one-fifth (20%) of the nation's power.

ANS:
nuclear-powered plants
nuclear powered plants

PTS: 1 REF: Electricity - The Essential Power

2. The end points of the electric grid are _____.

ANS: electric grids

PTS: 1 REF: The Traditional Electric Grid

3. More than half of Canadian electric power is produced from _____ at present.

ANS:
hydro-generation
hydrogeneration

PTS: 1 REF: The Traditional Electric Grid

4. The U.S. smart grid is developing primarily using _____ communication to transmit information.

ANS:

radio frequency (RF)

radio frequency

RF

PTS: 1

REF: What is the Smart Grid?

5. Home segments of the smart grid often use _____ technology that sends communications over the same lines that distribute AC power.

ANS: Powerline

PTS: 1

REF: What is the Smart Grid?

6. A(n) _____ allows the homeowner to monitor power use over time and confirm the effectiveness of energy efficiency measures as well as efforts to reduce peak demand usage.

ANS: home receiver

PTS: 1

REF: The Home Smart Grid

7. _____ generating equipment for home installation is now available from several manufacturers and can be installed by a professional service or by the homeowner.

ANS: Solar

PTS: 1

REF: The Home Smart Grid

8. _____ is the preferred form of energy because it is clean, easily controlled, and equally well-suited for micro and macro applications.

ANS: Electricity

PTS: 1

REF: The Traditional Electric Grid

SHORT ANSWER

1. Describe some of the sources requiring the greatest demand for electric power.

ANS:

The largest demand for power comes from electric motors that do much of the heavy work in residential and industrial applications. They drive air conditioners and furnaces, woodworking and metal fabricating machines, elevators and escalators, winches and ski lifts, plus thousands of smaller tools, appliances, and convenience items - everything from your alarm clock to your garage door opener.

PTS: 1

REF: Electricity - The Essential Power

2. Briefly describe the traditional electric grid.

ANS:

The traditional grid is an electro-mechanical system. It is made up of hardware: generators, wire transmission lines, transformers, switches, meters, and other components. It was designed in the 1950s and constructed to meet the objective of delivering adequate power to meet the demands of all end users. With only minor exceptions, it is a one-way system. Power moves from large generation facilities down the grid to end-users. There is no means of communication or any interactivity between end users and the grid.

PTS: 1

REF: The Traditional Electric Grid

3. List the basic deficiencies in the traditional electric grid that increase its vulnerability to failure as power use continues to rise.

ANS:

High rate of power loss from long distance transport

Limited ability to respond to peak load requirements

Lack of backup capacity

PTS: 1

REF: The Traditional Electric Grid

4. Identify the three most pressing factors driving the need for change in the traditional electric grid.

ANS:

Expanding national and world population, all of whom will need some level of electric service.

Increased expectations of people in developing areas for more and better electric service.

Development of whole new generations of electrical and electronic devices that nearly all people want to own or use.

PTS: 1

REF: The Traditional Electric Grid

5. List two environmental factors that also increased the need for change in the traditional grid.

ANS:

The rapid development of alternative electrical energy sources.

The need to conserve water use and prevent water pollution.

PTS: 1

REF: The Traditional Electric Grid

6. Identify three new components of the smart grid.

ANS:

Smart control and measuring devices,

Digital communications systems, and

Computer software programs.

PTS: 1

REF: What is the Smart Grid?

7. Discuss the importance of a power usage monitor in assisting the homeowner in improving energy efficiency.

ANS:

The power usage monitor (watt meter) accurately measures power consumption by individual devices. The usage monitor tells the actual power consumption of a device when in use and when turned off but still connected (plugged in) to the AC power service. Readouts from the smart meter display and the usage monitor allow the homeowner to reduce power consumption by replacing high wattage devices with more efficient low-power versions. They also show which devices should be disconnected from the AC power grid when not in use instead of just being turned off.

PTS: 1

REF: The Home Smart Grid