

Renewable Energy Fundamentals

Physics And Environmental Science · Answer Key · 10 Questions

1. Which process is used by photovoltaic cells to convert sunlight directly into electricity?

- A) The photoelectric effect**
- B) The electromagnetic induction effect
- C) The greenhouse effect
- D) The thermal expansion effect

2. What is the primary function of a turbine in a hydroelectric power plant?

- A) To purify the water flow
- B) To convert kinetic energy into mechanical energy**
- C) To store potential energy in a reservoir
- D) To increase the voltage of generated power

3. In wind energy technology, what is the purpose of a nacelle located at the top of the tower?

- A) To act as a lightning rod
- B) To house the gearbox, generator, and control electronics**
- C) To collect rainwater for cooling
- D) To stabilize the tower against high winds

4. Which form of renewable energy relies on the Earth's internal thermal gradient to produce steam for electricity generation?

- A) Tidal energy
- B) Biomass energy
- C) Geothermal energy**
- D) Solar thermal energy

5. What is the main chemical component of biogas produced during the anaerobic digestion of organic matter?

- A) Methane**
- B) Hydrogen peroxide
- C) Nitrogen gas
- D) Sulfur dioxide

6. Which of these energy sources is considered 'dispatchable,' meaning its output can be controlled to meet electricity demand?

- A) Solar photovoltaic
- B) Run-of-river hydroelectricity
- C) Geothermal**
- D) Wind

7. What energy transformation occurs within a solar thermal collector?

- A) Light to chemical energy
- B) Solar radiation to thermal energy**
- C) Kinetic energy to electrical energy
- D) Electrical energy to light energy

8. Which renewable energy source is characterized by the gravitational pull of the moon and the sun on Earth's oceans?

- A) Wave power
- B) Tidal energy**
- C) Ocean thermal energy conversion
- D) Hydroelectric power

9. What is a major environmental limitation associated with the large-scale implementation of corn-based ethanol as a biofuel?

- A) It requires higher wind speeds to process
- B) It competes with land used for food crop production**
- C) It creates radioactive waste
- D) It increases ocean salinity levels

10. Which component of a solar panel system is responsible for converting Direct Current (DC) into Alternating Current (AC) for grid use?

- A) Inverter**
- B) Transformer
- C) Rectifier
- D) Transistor