

Renewable Energy Fundamentals

Renewable Energy · Practice Test · 23 Questions

1. Which renewable energy source directly harnesses the Earth's internal heat?

- A) Solar thermal power
- B) Geothermal energy
- C) Biomass energy
- D) Hydroelectric power

2. The process of converting sunlight into electricity using semiconductor materials is known as:

- A) Photovoltaic effect
- B) Thermoelectric generation
- C) Electromagnetic induction
- D) Photosynthesis

3. Ocean thermal energy conversion (OTEC) utilizes the temperature difference between:

- A) Surface water and deep ocean water
- B) Freshwater rivers and saltwater oceans
- C) Air temperature and ocean currents
- D) Underground reservoirs and surface lakes

4. Which of the following is a primary byproduct of anaerobic digestion of organic matter for biogas production?

- A) Carbon dioxide and methane
- B) Oxygen and nitrogen
- C) Hydrogen and helium
- D) Sulfur dioxide and nitrous oxide

5. Concentrated solar power (CSP) systems typically use mirrors or lenses to focus sunlight onto a:

- A) Receiver to heat a fluid
- B) Photovoltaic panel array
- C) Wind turbine rotor
- D) Geothermal heat exchanger

6. The kinetic energy of moving water is captured by turbines in which type of renewable energy generation?

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

7. Which renewable energy technology converts the kinetic energy of air movement into electricity?

- A) Wind turbines
- B) Solar panels
- C) Biomass burners
- D) Geothermal plants

8. What is the primary challenge associated with the intermittency of solar and wind power?

- A) Unpredictable energy output
- B) Overheating of equipment
- C) High fuel costs
- D) Noise pollution

9. The 'bedrock' of geothermal energy extraction relies on accessing:

- A) Hot rocks and underground steam
- B) Surface water currents
- C) Solar radiation intensity
- D) Organic waste materials

10. Biomass energy is derived from:

- A) Organic materials, such as plants and animal waste
- B) Fossil fuels formed over millions of years
- C) Radioactive isotopes
- D) The Earth's magnetic field

11. Which of these is a significant environmental benefit of using renewable energy sources compared to fossil fuels?

- A) Reduced greenhouse gas emissions
- B) Increased air pollution
- C) Depletion of natural resources
- D) Higher water consumption

12. The 'cut-in speed' for a wind turbine refers to the:

- A) Minimum wind speed at which it begins to generate power
- B) Maximum wind speed it can withstand
- C) Speed at which the blades rotate
- D) Speed required for maintenance

13. What is a common method for storing excess electricity generated from intermittent renewable sources?

- A) Battery storage systems
- B) Burning natural gas
- C) Increased coal consumption
- D) Releasing excess heat into the atmosphere

14. Tidal energy harnesses the power of:

- A) The rise and fall of sea levels
- B) Ocean surface waves
- C) Deep sea currents
- D) Thermal gradients in the ocean

15. Which renewable energy source involves burning organic matter to produce heat or electricity?

- A) Biomass energy
- B) Solar energy
- C) Geothermal energy
- D) Wind energy

16. The efficiency of a photovoltaic solar panel is primarily determined by the material's ability to:

- A) Absorb photons and generate electron flow
- B) Withstand extreme temperatures
- C) Reflect sunlight
- D) Conduct heat

17. Hydropower dams generate electricity by utilizing the potential energy of water stored at a:

- A) Higher elevation
- B) Lower elevation
- C) Constant elevation
- D) Underground reservoir

18. What is the primary gas component of biogas produced from organic waste?

- A) Methane
- B) Oxygen
- C) Nitrogen
- D) Carbon dioxide

19. The 'capacity factor' of a renewable energy generator indicates:

- A) The ratio of actual energy output to its potential maximum output over a period
- B) Its physical size and footprint
- C) The average temperature it operates at
- D) The rate at which it degrades over time

20. Wave energy converters capture the energy from:

- A) The up-and-down motion of ocean surface waves
- B) Subsurface ocean currents
- C) The gravitational pull of the moon
- D) Changes in ocean salinity

21. Which of the following is NOT a form of direct solar energy utilization?

- A) Geothermal energy
- B) Solar thermal power
- C) Photovoltaic power
- D) Concentrated solar power

22. The 'triple junction' solar cell is an advanced type of photovoltaic technology designed to:

- A) Absorb a broader spectrum of sunlight
- B) Operate efficiently in low light conditions
- C) Withstand extreme weather
- D) Generate heat for direct use

23. What is a key factor in determining the viability of a geothermal energy project?

- A) Proximity to underground heat sources
- B) Availability of strong winds
- C) Access to large bodies of water
- D) Abundant sunshine throughout the year