1. What is the principle behind Ocean Thermal Energy Conversion (OTEC)?

a) Harnessing wave energy
b) Exploiting temperature difference between warm surface water and cold deep water
c) Utilizing tidal currents
d) Extracting energy from ocean salinity

Answer: b) Exploiting temperature difference between warm surface water and cold deep water

Explanation: OTEC systems work by utilizing the temperature gradient between warm surface water and cold deep water to generate electricity. This temperature difference is used to vaporize a working fluid, typically ammonia, which then drives a turbine to produce electricity.

2. How do geothermal power plants generate electricity?

a) Extracting heat from the Earth’s core
b) Utilizing steam from underground reservoirs
c) Converting magma into electricity
d) Harnessing tidal forces

Answer: b) Utilizing steam from underground reservoirs

Explanation: Geothermal power plants tap into underground reservoirs of steam or hot water. The heat from these reservoirs is used to produce steam, which drives turbines connected to generators, thus generating electricity.

3. What is the primary source of energy in magneto-hydro generated energy?

a) Solar radiation
b) Magnetic fields
c) Hydroelectric power
d) Geothermal heat

Answer: b) Magnetic fields

Explanation: Magneto-hydro generation involves the interaction between the motion of conducting fluids, such as molten metal or plasma, and magnetic fields. This interaction generates electrical currents, which can then be harvested to produce electricity.

4. Which of the following is a potential source of non-hazardous energy from nuclear wastes?

a) Fusion reactors
b) Fission reactors
c) Radioactive decay
d) Neutron capture

Answer: a) Fusion reactors

Explanation: Fusion reactors have the potential to utilize nuclear waste as fuel, converting it into non-hazardous elements through the process of nuclear fusion. This could provide a safe and sustainable source of energy while mitigating nuclear waste disposal issues.

5. What is the key principle behind generating electricity from gaseous cells in geothermal energy?

a) Extracting hydrogen from volcanic emissions
b) Converting geothermal gases into fuel cells
c) Utilizing gas turbines to harness geothermal heat
d) Harnessing methane emissions from geothermal reservoirs

Answer: c) Utilizing gas turbines to harness geothermal heat

Explanation: Gaseous cells in geothermal energy typically involve the use of gas turbines to directly convert the heat from geothermal reservoirs into electricity. This process involves burning gases or utilizing the high-temperature gases to drive the turbine.

6. Which of the following is a potential modern nonconventional energy source apart from those mentioned?

a) Wind power
b) Coal-fired power plants
c) Biomass energy
d) Hydroelectric dams

Answer: a) Wind power

Explanation: Wind power is considered a modern nonconventional energy source. It involves harnessing the kinetic energy of wind to generate electricity through wind turbines. It is renewable and emits no greenhouse gases during operation.

7. What is the primary advantage of Ocean Thermal Energy Conversion (OTEC) over other renewable energy sources?

a) Consistent energy production
b) Minimal environmental impact
c) Low initial investment
d) Unlimited resource availability

Answer: a) Consistent energy production

Explanation: OTEC systems offer consistent energy production as they rely on the temperature difference between ocean layers, which remains relatively stable over time. Unlike solar or wind energy, OTEC is not subject to variations in weather conditions.

8. Which of the following is a challenge associated with harnessing energy from ocean currents?

a) Difficulty in predicting currents
b) Limited geographical availability
c) High initial investment
d) Environmental pollution

Answer: a) Difficulty in predicting currents

Explanation: One challenge of harnessing energy from ocean currents is the difficulty in accurately predicting their behavior. Unlike tides, which follow predictable patterns, ocean currents can be influenced by various factors and may not always flow consistently.

9. What distinguishes non-hazardous energy from nuclear wastes from traditional nuclear power generation?

a) Lower efficiency
b) Higher radiation emissions
c) Safer waste disposal
d) Greater resource depletion

Answer: c) Safer waste disposal

Explanation: Non-hazardous energy from nuclear wastes aims to address the issue of radioactive waste disposal associated with traditional nuclear power generation. By utilizing advanced reactor designs or technologies like fusion, it seeks to produce energy while minimizing hazardous waste production.

10. What makes magneto-hydro generated energy a promising potential energy source?

a) Abundance of conducting fluids
b) Low environmental impact
c) High efficiency
d) Compatibility with existing infrastructure

Answer: c) High efficiency

Explanation: Magneto-hydro generated energy is promising due to its high efficiency in converting the kinetic energy of conducting fluids into electricity. This efficiency makes it a potentially viable option for generating electricity from various sources, such as liquid metals or plasma.