Renewable Energy

Choose one answer per question. Circle A, B, C, or D.

1. A visitor sees mirrors concentrating sunlight to heat a fluid that helps generate electricity. Which resource powers the plant?
   A. Solar energy
   B. Geothermal energy
   C. Tidal energy
   D. Biomass energy

2. A working demonstration uses the natural heat of hot water rising from deep underground. Which source is the display about?
   A. Biomass energy
   B. Wind energy
   C. Geothermal energy
   D. Solar energy

3. Which material on a loading dock belongs in a demonstration of biomass rather than fossil fuel?
   A. Coal from a mine
   B. Dry corn stalks left after harvest
   C. Diesel refined from crude oil
   D. Natural gas from a fossil reserve

4. A small photovoltaic cell powers a model fan in direct sunlight. What does the cell convert into electricity?
   A. Heat from a separate boiler
   B. Rotation of the fan blades
   C. Sound from the fan
   D. Light reaching the cell

5. At a conventional river hydropower station, which moving material turns the turbine?
   A. Steam from a coal boiler
   B. Water flowing past it
   C. Air rising through a cooling tower
   D. Liquid fuel moving down a pipe

6. A wind turbine and an electric fan both have blades. In the wind turbine, which event comes first in normal operation?

A. Moving air drives the blades
B. Electricity drives the blades to produce the wind
C. The blades cool a fluid that powers the generator
D. The generator creates sunlight to drive the blades

7. A solar water heater and a photovoltaic panel sit side by side on a roof. Which one directly supplies electricity?

A. Neither system can directly supply electricity
B. The solar water heater
C. Both systems directly supply electricity
D. The photovoltaic panel

8. A museum labels a system ‘geothermal heat pump’ and describes its use for heating and cooling a building. Which source does the system use?

A. Electricity collected by a water turbine
B. Moving air high above the building
C. The relatively steady temperature below the surface
D. Sunlight concentrated in a rooftop mirror

9. A two-reservoir plant has surplus electricity available at noon. Which action stores energy for use later?

A. Pump water into the upper reservoir
B. Let both reservoirs drain downstream
C. Send water through the turbine into the lower reservoir
D. Release the upper reservoir so the water bypasses the turbine

10. A solar garden charges a battery at midday and discharges it after sunset. What purpose is the battery serving?

A. Keeping the panels at maximum output overnight
B. Collecting sunlight after sunset
C. Increasing the nameplate capacity of each panel
D. Making some earlier solar generation available later

11. A wind unit supplies a steady 7.5 MW for two hours in a classroom model. How much energy does it produce during those hours?

A. 7.5 MWh
B. 3.75 MWh
C. 15 MWh
D. 9.5 MWh

12. A 2.5 MW array delivers 18 MWh over a 24-hour day. What is its capacity factor for that day?

A. 18%
B. 30%
C. 42%
D. 72%

13. Wind site A has 4 MW of capacity and a 25% capacity factor. Site B has 2 MW and a 60% capacity factor over the same month. Which statement is correct?

A. The capacity factors are enough to tell that site A generates more
B. Site A generates exactly twice as much energy
C. Both sites generate equal energy
D. Site B generates more energy

14. A battery stores energy from 3 MWh of incoming electricity and later delivers 2.4 MWh, with no other charging. What fraction of the incoming electrical energy does it return?

A. 80%
B. 20%
C. 60%
D. 125%

15. A diagram shows hot geothermal water warming a second liquid across a barrier. Vapor from the second liquid spins the turbine. Which label fits the diagram?

A. Pumped-storage hydropower plant
B. Dry-steam geothermal plant
C. Binary-cycle geothermal plant
D. Photovoltaic solar plant