**Wind Turbines Post-Quiz Answer Key**

**A. Circle the best choice:**

1. **energy:** quantitative qualitative
2. **water:**  renewable nonrenewable

energy source energy source

1. **fossil fuel:**  renewable nonrenewable

energy source energy source

1. **gasoline:**  renewable nonrenewable

energy source energy source

1. **wind:**  renewable nonrenewable

energy source energy source

1. **natural gas:**  renewable nonrenewable

energy source energy source

1. **heat:** energy form energy source
2. **sun:** energy form energy source
3. **light:** energy form energy source
4. **gravity:** energy form energy source

**B. Use the following words to label the six basic components that comprise a wind turbine:**

**tower**

**shaft**

**electric generator**

**rotor**

**gearbox**

**rotor blade**



1

**Wind**

**Rotor**

**Rotor Blade**

**Shaft**

**Gearbox**

**Tower**

**Electric Generator**

3

5

2

6

4

**C. Write a short description of each:**

1. **Rotor and rotor blade:**

A **rotor** is the heart of a wind turbine. It is the rotating central piece to a functioning wind turbine. Large propeller-like blades known as **rotor blades** extend from the *rotor* to capture the dynamic motion of the wind and its kinetic energy. The blowing wind applies a force against the rotor blades and causes the *rotor* to rotate (hence the name *rotor*). With this process, the wind’s kinetic energy is converted to mechanical rotational energy to spin the rotor blades.

1. **Shaft:**

The *rotor* is connected to a rod known as **shaft.** The *shaft* is an apparatus that directly connects the *rotor* to an **electrical generator.** The *shaft’s* purpose is to transfer the rotational mechanical energy generated by the rotating rotor directly to the input of the *electrical generator.*

1. **Gearbox:**

Most wind turbines contain a **gearbox** connected to the shaft, which turns the slow rotation of the *rotor blades* and *shaft* into faster rotations that are more suitable to drive an electrical generator.

1. **Electric generator:**

The rotating shaft directs the rotation of a **rotating electrical generator**. The rotating generator is placed between two magnets to induce electricity to flow through a conductor through a process known as **electromagnetic induction.** With this process, rotational mechanical energy is converted into electrical energy, which can be stored and transmitted as electricity to an electric utility company.