

Name: _____



1. _____ True or False

All the energy in the universe that has ever existed is the same amount of energy that exists today.

2. _____ True or False

The wind is not blowing so the turbine blades are not moving. The blades represent potential energy.

3. _____ Multiple Choice

Some areas of the Earth have dependable strong winds while other areas do not. The direction and strength of the wind are modified by:

- a. Earth's terrain
- b. Bodies of water
- c. Vegetative cover
- d. All of these

4. _____ Multiple Choice

To generate electricity in a wind turbine, electricity is produced when the rotating electrical generator is placed between two _____.

- a. Blades
- b. Rotors
- c. Gears
- d. Magnets

5. _____ Multiple Choice

All of these are true of wind turbines, except:

- a. It is a clean, renewable energy source.
- b. It is the top killer of birds in the wild.
- c. The wind energy field creates jobs and U.S. competitiveness.
- d. It is a sustainable, domestic energy source.

6. _____ Multiple Choice

This is the sequence of the Engineering Design Process.

- a. Create, Ask, Plan, Imagine, Improve
- b. Imagine, Create, Plan, Ask, Improve
- c. Ask, Imagine, Plan, Create, Improve
- d. Plan, Improve, Ask, Imagine, Create

7. _____ Multiple Choice

Two forces are acting on the blades when they are rotating in the wind. Identify them and whether they are a positive or a negative force.

- a. Lift = negative, Drag = positive
- b. Gravity = positive, Thrust = negative
- c. Lift = positive, Drag = negative
- d. Thrust = positive, Lift = negative

8. _____ Multiple Choice

To create more voltage,

- a. Make your rotor spin faster.
- b. Make your rotor spin slower.
- c. Increase the number of blades.
- d. Increase the weight of the blades.

9. _____ Multiple Choice

Which angle of the blade, to the wind, would cause the greatest amount of drag?

- a. 90°
- b. 60°
- c. 30°
- d. 0°

10. _____ Multiple Choice

The units used to measure electrical output of the wind turbine are;

- a. Watts
- b. Millivolts
- c. Coulombs
- d. Joules

Short Answer

Explain the energy transfer in a wind turbine beginning at the sun and ending with a light bulb.

Be sure to use these terms in your answer. These can be used more than once. (5 points)

Electrical, Mechanical, Radiant, Thermal

Many variables are taken into consideration when designing your blades and placement in the rotor. List a minimum of four. (5 points)