Name_

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First read the attached text pages from Physical Science Nat. Geo. Then answer the question below. Write answers on the line provided.

1. The 1st Law of Thermodynamics is really just another way of the stating the Law of Conservation of Energy. If energy can neither be created nor can it be destroyed, then any increase in the total thermal energy of a system equals the ______.
See pg175

A. heat transferred

- B. work done
- C. work done plus heat transferred
- D. energy and heat

2. Doing work on a system is a way of adding energy to a system. A bicycle air pump can be a system. Work is done on the system by pushing down on the handle. This causes the pump to become warm. Some of this warmth is inevitably transferred to the air around the pump. Because of this, we consider a bicycle pump to be a

See pg175

- A. closed system
- B. open system
- C. neither
- D. both open and closed system

_____3. Can heat flow spontaneously from cold objects to warm objects? It turns out this process never happens, but would it violate the 1st Law of Thermodynamics? See pg175

- A. As long as the increase in thermal energy of the cold object is greater than the loss of the warm object, then YES.
- B. As long as the increase in thermal energy gained by warm object equaled the loss of the cold object, then NO, even though this cannot happen.
- C. Maybe

___4. One way to state *The 2nd Law of Thermodynamics* is that

See pg175

- A. It is impossible for heat to flow from warmer objects to cooler objects.
- B. It is impossible for heat to flow from a cooler objects to a warmer objects spontaneously (unless work is done).
- C. Neither is a way of stating *The 2nd Law of Thermodynamics*

_____5. Converting heat to work has never been a very efficient process due the laws of thermodynamics. Yet another reason to be concerned about our present energy crisis and the need for more fuel efficiency and/or other alternative energy sources. In combustion engine why can chemical PE fuel energy in never totally equal the work energy in joules out? See pg176

Choose the bet response

- A. Friction alone explains this.
- B. Friction produces heat and there are many moving parts in a car engine.
- C. Friction produces heat, combustion produces heat and much of the heat is radiated outward "*lost*" to the surroundings and not converted into mechanical energy
- D. Car internal combustion engines are just inefficient and lose heat.

_____6. This following describes which step in the piston engine stroke cycle? As the valve opens the piston moves downward drawing a mixture of gasoline and air into the cylinder. See pg177

- A. Intake stroke
- B. Compression stroke
- C. Power stroke
- D. Exhaust stroke

_____7. This following describes which step in the piston engine stroke cycle? As the piston moves up, the exhaust
valve opens, and hot gases are pushed out of the cylinder.See pg177

- A. Intake stroke
- B. Compression stroke
- C. Power stroke
- D. Exhaust stroke

_____8. The adjacent illustration is a depiction of which of the steps in the piston engine stroke cycle? Look closely See pg177

- A. Intake stroke
- B. Compression stroke
- C. Power stroke
- D. Exhaust stroke



9. The adjacent illustration is a depiction of which of the steps in the piston engine stroke cycle? Look closely See pg177

- A. Intake stroke
- B. Compression stroke
- C. Power stroke
- D. Exhaust stroke

_____10. A car's engine transmission is rightly named because it transforms or transfers the energy of :

- A. The tires rotation into piston power stokes.
- B. Reciprocal mechanical motion into rotary mechanical motion of the crankshaft
- C. Reciprocal chemical energy into rotary mechanical motion of the crankshaft
- D. Rotary mechanical energy into elastic energy of the crankshaft

