

Name: _____

Quiz 4
Physics 105
9 October 2002

- 1. An electric generating plant produces 400 MW of electric power while operating at 40% efficiency. The rate at which this plant consumes energy [in the form of the thermal energy obtained by burning the coal that is fed into the plant] is
 - (a) 160 MW.
 - (b) 240 MW.
 - (c) 600 MW.
 - ⇒ (d) **1000 MW.**
 - (e) 1400 MW.

- 2. Country X's population is doubling every 10 years. What is its rate of population growth?
 - (a) It is impossible to answer this without knowing country X's population.
 - (b) 14% per year.
 - (c) 10% per year.
 - ⇒ (d) **7% per year.**
 - (e) 2% per year.

- 3. Small ripples on the surface of a pond are
 - (a) longitudinal waves in a two-dimensional medium.
 - ⇒ (b) **transverse waves in a two-dimensional medium.**
 - (c) longitudinal waves in a three-dimensional medium.
 - (d) transverse waves in a three dimensional medium.
 - (e) not really "waves" at all.

- 4. Is the force holding the electrons into their atomic orbits in an individual atom basically the same as the force that hold the sun's planets in their orbits? Why or why not?
 - (a) Yes; it is the force of gravity in both cases.
 - (b) Yes; it is the centrifugal force in both cases.
 - ⇒ (c) **No; gravity holds planets in their orbits, while the electromagnetic force holds electrons in their orbits.**
 - (d) No; gravity holds the sun's planets in their orbits, while nuclear forces hold the electrons in their orbits.
 - (e) No; the sun's energy source is nuclear fusion, and fusion does not occur within individual atoms.