Please DO NOT write on this page. **FORM: B**

EOU Thermodynamics Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. The number of calories released when 4 grams of 100°C steam cools to become 4 grams of 0° ice is
a. 2480 calories.
b. 2880 calories.
c. none of the above

____ 2. When 1 grams of a substance loses 5 calories in cooling 1°C, its specific heat capacity using water as the unit of measure, is _____.
a. 6
b. 20
c. 10
d. 5
e. none of the above

____ 3. To say that evaporation is a cooling process means that when evaporation occurs,
a. the evaporating vapor cools.
b. the remaining liquid cools.
c. both A and B.
d. none of the above

____ 4. Two pots are filled with boiling water. The pots are exactly the same size, but one pot is white and the other is black. Which pots cools faster?
a. The black pot.
b. The white pot.
c. Neither—they both cool at the same rate.

____ 5. The lowest possible temperature in nature is
a. 0 degrees C.
b. –273 degrees C.
c. 4 K.

____ 6. Newton's law of cooling says that the rate of cooling depends on
a. the volume of an object.
b. the specific heat capacity of an object.
c. the mass of an object.
d. the temperature difference between an object and its surroundings.
e. all of the above

____ 7. Some molecules are able to absorb large amounts of energy in the form of internal vibrations and rotations. Materials composed of such molecules would have _____.
a. high specific heat capacities
b. low specific heat capacities

____ 8. Adiabatic processes occur in
a. Earth's mantle.
b. the atmosphere.
c. the oceans.
d. all of the above.
e. none of the above

____ 9. The energy needed to turn 37 grams of 100°C boiling water to 100°C steam is
   a. 37 × 540 calories.
   b. 540 calories.
   c. neither of the above

____ 10. Heat is the _____.
   a. total amount of energy contained in an object
   b. amount of energy all the molecules have
   c. average amount of energy per molecule contained in an object
   d. energy transferred between objects because of a temperature difference
   e. all of the above

____ 11. The ideal efficiency for a heat engine operating between temperatures of 2800 K and 338 K is
   a. 12%.
   b. 50%.
   c. 25%.
   d. 88%.
   e. none of the above.

____ 12. Heat travels from the sun to Earth by
   a. vacuumization.
   b. insulation.
   c. conduction.
   d. convection.
   e. radiation.

____ 13. Heat transfer by convection occurs when
   a. electromagnetic waves travel from one place to another through a vacuum.
   b. electrons bump into other electrons.
   c. atoms give off heat in the form of electromagnetic waves.
   d. large numbers of atoms move from place to place.
   e. none of the above

____ 14. The cooling effect inside a refrigerator is produced by
   a. an electric motor that converts electrical energy into thermal energy.
   b. vaporizing the refrigeration liquid.
   c. compressing the refrigeration gas into a liquid.
   d. proper insulation.
   e. none of the above

____ 15. Nine hundred calories of heat are added to 200 grams of water when its temperature is 27°C. The resulting temperature of the water is
   a. 32°C
   b. 32°C
   c. 5°C
   d. 80°C
   e. 100°C

____ 16. Two identical blocks of iron, one at 10 degrees C and the other at 20 degrees C, are put in contact. Suppose the cooler block cools to 5 degrees C and the warmer block warms to 25 degrees C. This would violate the
   a. first law of thermodynamics.
   b. second law of thermodynamics.
   c. both of the above
   d. none of the above

____ 17. 110 joules of heat is added to a system that performs 35 Joules of work. The internal energy change of the system is
   a. 145 J.
   b. 35 J.
   c. 75 J.
   d. 0 J.
   e. none of the above.

____ 18. Mix 1 liter of 10°C water with 2 liters of 20°C water and you'll have 3 liters of water at _____.
   a. 23°C
   b. 19°C
   c. 17°C
   d. 15°C

____ 19. If you were caught in freezing weather with only a candle for heat, you would be warmest in
   a. a car.
   b. an igloo.
   c. a tent.
   d. a wooden house.

____ 20. As a system becomes more disordered, entropy
   a. decreases.
   b. increases.
   c. remains the same.