

EOU Thermodynamics Quiz

Multiple Choice

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

- _____ 1. To say that evaporation is a cooling process means that when evaporation occurs,
- the remaining liquid cools.
 - the evaporating vapor cools.
 - both A and B.
 - none of the above
- _____ 2. The lowest possible temperature in nature is
- 273 degrees C.
 - 0 degrees C.
 - 4 K.
- _____ 3. As a system becomes more disordered, entropy
- decreases.
 - increases.
 - remains the same.
- _____ 4. 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 _____.
- low specific heat capacities
 - high specific heat capacities
- _____ 5. 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?
- The white pot.
 - The black pot.
 - Neither—they both cool at the same rate.
- _____ 6. One thousand calories of heat are added to 250 grams of water when its temperature is 46°C. The resulting temperature of the water is
- 50°C
 - 32°C
 - 4°C
 - 80°C
 - 100°C
- _____ 7. Heat is the _____.
- amount of energy all the molecules have
 - energy transferred between objects because of a temperature difference
 - average amount of energy per molecule contained in an object
 - total amount of energy contained in an object
 - all of the above
- _____ 8. When 3 grams of a substance loses 3 calories in cooling 1°C, its specific heat capacity using water as the unit of measure, is _____.
- 10
 - 1
 - 20
 - 6
 - none of the above

- _____ 9. The cooling effect inside a refrigerator is produced by
- compressing the refrigeration gas into a liquid.
 - proper insulation.
 - vaporizing the refrigeration liquid.
 - an electric motor that converts electrical energy into thermal energy.
 - none of the above
- _____ 10. 80 joules of heat is added to a system that performs 60 Joules of work. The internal energy change of the system is
- 140 J.
 - 0 J.
 - 20 J.
 - 60 J.
 - none of the above.
- _____ 11. The ideal efficiency for a heat engine operating between temperatures of 2600 K and 373 K is
- 14%.
 - 25%.
 - 50%.
 - 86%.
 - none of the above.
- _____ 12. Heat transfer by convection occurs when
- atoms give off heat in the form of electromagnetic waves.
 - large numbers of atoms move from place to place.
 - electromagnetic waves travel from one place to another through a vacuum.
 - electrons bump into other electrons.
 - none of the above
- _____ 13. The energy needed to turn 35 grams of 100°C boiling water to 100°C steam is
- 540 calories.
 - 35×540 calories.
 - neither of the above
- _____ 14. Newton's law of cooling says that the rate of cooling depends on
- the volume of an object.
 - the temperature difference between an object and its surroundings.
 - the specific heat capacity of an object.
 - the mass of an object.
 - all of the above
- _____ 15. Adiabatic processes occur in
- Earth's mantle.
 - the oceans.
 - the atmosphere.
 - all of the above.
 - none of the above
- _____ 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
- second law of thermodynamics.
 - first law of thermodynamics.
 - both of the above
 - none of the above

- _____ 17. Mix 1 liter of 10°C water with 2 liters of 20°C water and you'll have 3 liters of water at _____.
a. 17°C
b. 15°C
c. 23°C
d. 19°C
- _____ 18. Heat travels from the sun to Earth by
a. conduction.
b. radiation.
c. vacuumization.
d. convection.
e. insulation.
- _____ 19. The number of calories released when 1 gram of 100°C steam cools to become 1 gram of 0° ice is
a. 620 calories.
b. 720 calories.
c. none of the above
- _____ 20. If you were caught in freezing weather with only a candle for heat, you would be warmest in
a. a tent.
b. a car.
c. a wooden house.
d. an igloo.