

EOU Thermodynamics Quiz

Multiple Choice

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

- _____ 1. Heat travels from the sun to Earth by
- conduction.
 - radiation.
 - convection.
 - insulation.
 - vacuumization.
- _____ 2. 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 black pot.
 - The white pot.
 - Neither—they both cool at the same rate.
- _____ 3. Mix 5 liters of 30°C water with 6 liters of 50°C water and you'll have 11 liters of water at _____.
- 39°C
 - 47°C
 - 43°C
 - 41°C
- _____ 4. The energy needed to turn 12 grams of 100°C boiling water to 100°C steam is
- 12×540 calories.
 - 540 calories.
 - neither of the above
- _____ 5. Nine hundred calories of heat are added to 300 grams of water when its temperature is 53°C. The resulting temperature of the water is
- 56°C
 - 3°C
 - 32°C
 - 80°C
 - 100°C
- _____ 6. 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
- _____ 7. If you were caught in freezing weather with only a candle for heat, you would be warmest in
- a wooden house.
 - a car.
 - a tent.
 - an igloo.
- _____ 8. As a system becomes more disordered, entropy
- increases.
 - decreases.
 - remains the same.

- _____ 9. When 2 grams of a substance loses 4 calories in cooling 2°C , its specific heat capacity using water as the unit of measure, is _____.
- 20
 - 1
 - 10
 - 6
 - none of the above
- _____ 10. 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
- first law of thermodynamics.
 - second law of thermodynamics.
 - both of the above
 - none of the above
- _____ 11. Heat is the _____.
- average amount of energy per molecule contained in an object
 - energy transferred between objects because of a temperature difference
 - total amount of energy contained in an object
 - amount of energy all the molecules have
 - all of the above
- _____ 12. 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 _____.
- high specific heat capacities
 - low specific heat capacities
- _____ 13. The cooling effect inside a refrigerator is produced by
- compressing the refrigeration gas into a liquid.
 - vaporizing the refrigeration liquid.
 - proper insulation.
 - an electric motor that converts electrical energy into thermal energy.
 - none of the above
- _____ 14. Heat transfer by convection occurs when
- electromagnetic waves travel from one place to another through a vacuum.
 - atoms give off heat in the form of electromagnetic waves.
 - electrons bump into other electrons.
 - large numbers of atoms move from place to place.
 - none of the above
- _____ 15. Adiabatic processes occur in
- the oceans.
 - Earth's mantle.
 - the atmosphere.
 - all of the above.
 - none of the above
- _____ 16. The ideal efficiency for a heat engine operating between temperatures of 2050 K and 302 K is
- 15%.
 - 25%.
 - 85%.
 - 50%.
 - none of the above.

- _____ 17. The lowest possible temperature in nature is
- a. -273 degrees C.
 - b. 4 K.
 - c. 0 degrees C.
- _____ 18. 100 joules of heat is added to a system that performs 40 Joules of work. The internal energy change of the system is
- a. 0 J.
 - b. 40 J.
 - c. 60 J.
 - d. 140 J.
 - e. none of the above.
- _____ 19. Newton's law of cooling says that the rate of cooling depends on
- a. the volume of an object.
 - b. the mass of an object.
 - c. the specific heat capacity of an object.
 - d. the temperature difference between an object and its surroundings.
 - e. all of the above
- _____ 20. 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