sample question for chapters 10 11 and 12 - goderya

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

1. If it is given that 546 K equals 273°C, then it follows that 400 K equals:
   a. 127°C  b. 150°C  c. 473°C  d. 1 200°C

2. A temperature change from 15°C to 35°C corresponds to what incremental change in °F?
   a. 20  b. 40  c. 36  d. 313

3. A steel wire, 150 m long at 10°C, has a coefficient of linear expansion of \(11 \times 10^{-6}/\text{°C}\). Give its change in length as the temperature changes from 10°C to 45°C.
   a. 0.65 cm  b. 1.8 cm  c. 5.8 cm  d. 12 cm

4. Heat flow occurs between two bodies in thermal contact when they differ in what property?
   a. mass  b. specific heat  c. density  d. temperature

5. A hot (70°C) lump of metal has a mass of 250 g and a specific heat of 0.25 cal/g·°C. John drops the metal into a 500-g calorimeter containing 75 g of water at 20°C. The calorimeter is constructed of a material that has a specific heat of 0.10 cal/g·°C. When equilibrium is reached, what will be the final temperature? \(c_{\text{water}} = 1.00 \text{ cal/g·°C}\).
   a. 114°C  b. 72°C  c. 64°C  d. 37°C

6. Which of the following best describes a substance in which the temperature remains constant while at the same time it is experiencing an inward heat flow?
   a. gas  b. liquid  c. solid  d. substance undergoing a change of state

7. Iced tea is made by adding ice to 1.8 kg of hot tea, initially at 80°C. How many kg of ice, initially at 0°C, are required to bring the mixture to 10°C? \(L_f = 3.33 \times 10^5 \text{ J/kg}, c_w = 4.186 \text{ J/kg·°C}\)
   a. 1.8 kg  b. 1.6 kg  c. 1.4 kg  d. 1.2 kg

8. When a wool blanket is used to keep warm, what is the primary insulating material?
   a. wool  b. air  c. the trim around the edge of the blanket  d. a thin layer of aluminum foil (usually not apparent) inside the blanket

9. What is the work done on the gas as it expands from pressure \(P_1\) and volume \(V_1\) to pressure \(P_2\) and volume \(V_2\) along the indicated straight line?

   ![Diagram](image)
   a. \((P_1 + P_2)(V_1 - V_2)/2\)  b. \((P_1 + P_2)(V_1 - V_2)\)  c. \((P_1 + P_2)(V_1 - V_2)/2\)  d. \((P_1 - P_2)(V_1 + V_2)\)

10. According to the first law of thermodynamics, the sum of the heat gained by a system and the work done on that same system is equivalent to which of the following?
   a. entropy change  b. internal energy change  c. temperature change  d. specific heat

11. A heat engine exhausts 3 000 J of heat while performing 1 500 J of useful work. What is the efficiency of the engine?
   a. 15%  b. 33%  c. 50%  d. 60%

12. A 10-kg piece of aluminum (which has a specific heat of 900 J/kg·°C) is warmed so that its temperature increases by 5.0°C. How much heat was transferred into it?
   a. \(4.5 \times 10^4 \text{ J}\)  b. \(9.0 \times 10^4 \text{ J}\)  c. \(1.4 \times 10^5 \text{ J}\)  d. \(2.0 \times 10^5 \text{ J}\)
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Answer Section

MULTIPLE CHOICE

1. ANS: A DIF: 2
   TOP: 10.1 Temperature and the Zeroth Law of Thermodynamics | 10.2 Thermometers and Temperature Scales

2. ANS: C DIF: 2
   TOP: 10.1 Temperature and the Zeroth Law of Thermodynamics | 10.2 Thermometers and Temperature Scales

3. ANS: C DIF: 2
   TOP: 10.3 Thermal Expansion of Solids and Liquids

4. ANS: D DIF: 1
   TOP: 11.1 Heat and Internal Energy | 11.2 Specific Heat

5. ANS: D DIF: 3
   TOP: 11.3 Calorimetry

6. ANS: D DIF: 1
   TOP: 11.4 Latent Heat and Phase Change

7. ANS: C DIF: 2
   TOP: 11.4 Latent Heat and Phase Change

8. ANS: B DIF: 1
   TOP: 11.5 Energy Transfer

9. ANS: A DIF: 2
   TOP: 12.1 Work in Thermodynamic Processes

10. ANS: B DIF: 1
    TOP: 12.2 The First Law of Thermodynamics | 12.3 Thermal Processes

11. ANS: B DIF: 2
    TOP: 12.4 Heat Engines and the Second Law of Thermodynamics

12. ANS: A DIF: 2
    TOP: 11.1 Heat and Internal Energy | 11.2 Specific Heat