Calorimetry and Energy Conservation Worksheet

Scoring guide · one credit per question · review written work against each rubric

Calorimetry and Energy Conservation

Question 1

Choice (2)

The object loses heat, so q for that object is negative.

Question 2

q = (50.0 g)(4.18 J/(g·°C))(4.0 °C) = 836 J. About 8.4 × 10² J is appropriate if reporting two significant figures.

Question 3

Choice (1)

The object loses the same magnitude of heat the water gains.

Question 4

Heat escaping to the room is missing from the water’s heat gain. The energy transferred from the sample is then greater than the heat measured in the water alone.

Two Metal Samples in Water

Question 5

Choice (2)

Q’s water warms by 6.0 °C, compared with 4.0 °C for P. Both baths have the same mass and specific heat.

Question 6

The water gains (50.0)(4.18)(24.0 − 20.0) = 836 J. The metal therefore has q = −836 J, or approximately −8.4 × 10² J.

Question 7

Choice (1)

Final minus initial is 24.0 − 80.0 = −56.0 °C.

Question 8

Water gains 836 J, so the metal loses 836 J. The metal’s ΔT is −56.0 °C. Its specific heat is (−836 J)/[(30.0 g)(−56.0 °C)] ≈ 0.50 J/(g·°C).