

Question 1

An ideal gas expands at a constant pressure of 240cmHg from 250 cm³ to 780 cm³. It is then allowed to cool at constant volume to its original temperature. What is the net amount of heat that flows into the gas during the entire process?

- A) 170 cal
- B) 4.04 cal
- C) 40.4 cal
- D) 59.6 cal

Question 2

As 3.0 liters of ideal gas at 27° C is heated, it expands at a constant pressure of 2.0 atm. How much work is done by the gas as its temperature is changed from 27° C to 227° C?

- A) 0.37 kJ
- B) 1.09 kJ
- C) 405 kJ
- D) 0.40 kJ

Question 3

How much external work is done by an ideal gas in expanding from a volume of 3.0 liters to a volume of 30.0 liters against a constant pressure of 2.0 atm?

- A) 5.5 kJ
- B) 5500 kJ
- C) 6.1 kJ
- D) 54 kJ

Question 4

A 2.0 kg metal block ($c=0.137$ cal/g·° C) is heated from 15° C to 90° C. By how much does its internal energy change?

- A) 21 kJ
- B) 86 J
- C) 103 kJ
- D) 86 kJ

Question 5

If a certain mass of water falls a distance of 854 m and all the energy is effective in heating the water, what will be the temperature rise of water?

- A) 8.38° C
- B) 2.00° C
- C) 2000° C
- D) 35.1° C

Question 6

How many joules of heat per hour are produced in a motor that is 75.0 percent efficient and requires 0.250 hp to run it?

- A) 168 kJ

Multiple-Choice Questions of Chapter 15

- B) 503 kJ
- C) 1.2 kJ
- D) 0.25 kJ

Question 7

Compute the entropy change of 5.00 g of water at 100°C as it changes to steam at 100°C under standard pressure.

- A) 27.0 cal/K = 113 J/K
- B) 1.07 cal/K = 4.49 J/K
- C) 7.24 cal/K = 30.3 J/K
- D) 1.45 cal/K 6.06 J/K

Question 8

An ideal gas was slowly expanded from 2.00 m³ to 3.00 m³ at a constant temperature of 30° C. The entropy change of the gas was +47 J/K during the process. (a) How much heat was added to the gas during the process? (b) How much work did the gas do during the process?

- A) (a) 14.2 kcal, (b) 3.4 kJ
- B) (a) 0.337 kcal, (b) 1.40 kJ
- C) (a) 3.4 kcal, (b) 14 kJ
- D) (a) 59.7 kcal, (b) 250 kJ

Question 9

A household refrigerator has a coefficient of performance of 5.2. If the room temperature outside the refrigerator is 28° C, what is the lowest temperature that can be obtained inside the refrigerator?

- A) -10.8° C
- B) -15.7° C
- C) -18.2° C
- D) -20.5° C

Question 10

The Carnot efficiency for a heat engine operating between the temperatures of 300° C and 15° C is

- A) 5%
- B) 50%
- C) 74%
- D) 93%