Question 1

Not yet answered

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Air that initially occupies 0 p expanded isothermally to a pressure of 101.3 kPa and then cooled at constant pressure until it reaches its initial volume. Compute the work done by the air. (Gauge pressure is the difference between the actual pressure and atmospheric pressure).

Select one:

- a. 5.60×10^3 J.
- b. -1.44×10^4 J.
- c. 2×10^4 J.
- d. -2×10^4 J.

Question 2

Not yet answered

Marked out of 1.00

A sample of gas expands from an initial pressure and volume of 10 Pa and 1.0 m^3 to a final volume of 2.0 m^3. During the expansion, the pressure and volume are related by the equation $p = aV^2$, where $a = 10$ N/m^8. Determine the work done by the gas during this expansion.

Select one:

- a. 23 J.
- b. -23 J.
- c. 69 J.
- d. -69 J.

Question 3

Not yet answered

Marked out of 1.00

In an experiment, 200 g of aluminum (with a specific heat of 900 J/kg.K) at 100°C is mixed with 50.0 g of water

at 20.0°C, with the mixture thermally isolated. What is the entropy changes of the water?

Select one:

a. 22.1 J/K.

b. -26.6 J/K.

c. -22.1 J/K.

d. 26.6 J/K.

Question 4

Not yet answered

Marked out of 1.00

The temperature of 2.00 mol of an ideal monatomic gas is raised 15.0 K in an adiabatic process. What are the work W done by the gas, the energy transferred as heat Q, and the change ΔE_{int} in internal energy of the gas?

Select one:

a. W = –374 J, Q = 0, ΔE_{int} = +374 J.

b. W = +374 J, Q = 0, ΔE_{int} = +374 J.

c. W = –374 J, Q = +374, ΔE_{int} = 0 J.

d. W = +374 J, Q = –374, ΔE_{int} = 0 J.

Question **5**

Not yet answered

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A container encloses 2 mol of an ideal gas that has molar mass M_1 and 0.5 mol of a second ideal gas that has molar mass $M_2 = 3M_1$. What fraction of the total pressure on the container wall is attributable to the second gas?

Select one:

- a. 0.3.
- b. 0.75.
- c. 0.25.
- d. 0.2.

Question **6**

Not yet answered

Marked out of 1.00

Determine the average value of the translational kinetic energy of the molecules of an ideal gas at 0.00°C.

Select one:

- a. 0 J.
- b. 5.65×10^{-21} J.
- c. 3.9×10^{3} J.
- d. 3.4×10^{3} J.

Question 7

Not yet answered

Marked out of 1.00

A 500 W Carnot engine operates between constant-temperature reservoirs at 100°C and 60.0°C. What is the rate at which energy E_1 is taken in by the engine as heat and energy E_2 exhausted by the engine as heat?

Select one:

- a. E_1 = 4170 J, E_2 = 4670 J.
- b. E_1 = 4170 J/s, E_2 = 4670 J/s.
- c. E_1 = 4670 J, E_2 = 4170 J.
- d. E_1 = 4670 J/s, E_2 = 4170 J/s.

Question 8

Not yet answered

Marked out of 1.00

A certain gas occupies a volume of 4.3 L at a pressure of 1.2 atm and a temperature of 310 K. It is compressed adiabatically to a volume of 0.76 L. Determine the final pressure and the final temperature, assuming the gas to be an ideal gas for which γ = 1.4.

Select one:

- a. 13.6 atm, 620 K.
- b. 13.6 atm, 310 K.
- c. 6.8 atm, 620 K.
- d. 6.8 atm, 310 K.

Question 9

Not yet answered

Marked out of 1.00

How much energy must be transferred as heat for a reversible isothermal expansion of an ideal gas at 132°C if the entropy of the gas increases by 46.0 J/K?

Select one:

- a. 6.07×10^4 J.
- b. 1.86×10^4 J.
- c. -1.86×10^4 J.
- d. -6.07×10^4 J.

Question 10

Not yet answered

Marked out of 1.00

When 20.9 J was added as heat to a particular ideal gas, the volume of the gas changed from 50.0 cm^3 to 100 cm^3 while the pressure remained at 1.00 atm. By how much did the internal energy of the gas change?

Select one:

- a. -25.9 J.
- b. 15.9 J.
- c. -15.9J.
- d. 25.9 J.