Q1.

In which process is work done by an ideal gas?

A doubling the pressure at constant volume ○

B doubling the volume at constant pressure ○

C doubling the absolute temperature at constant volume ○

D doubling the pressure at constant temperature ○

(Total 1 mark)

Q2.

Three molecules have speeds $2.00v$, $4.00v$ and $5.00v$.

What is the c_{rms} speed of these molecules?

A $3.50v$ ○

B $3.67v$ ○

C $3.87v$ ○

D $26.0v$ ○

(Total 1 mark)

Q3.

An ideal gas is enclosed in an insulated container with a small electric heater.
The initial temperature of the gas is 300 K.
The product of pressure and volume is 5000 J.
The gas expands at constant pressure and does 1660 J of work.

What is the final temperature of the gas?

A 300 K ○

B 400 K ○

C 450 K ○

D 900 K ○

(Total 1 mark)

Q4.

A 1000 W heater is 75% efficient. The heater is used to increase the temperature of some water from 10 °C to 85 °C in 7 hours.

What mass of water is heated?

specific heat capacity of water = 4200 J kg^{-1} K^{-1}

A 1.0 kg ○

B 13 kg ○

C 60 kg ○

D 110 kg ○

(Total 1 mark)

Q5.

Which can lead to a value for the absolute zero of temperature?

A Boyle's law ○

B Brownian motion ○

C Charles's law ○

D Rutherford scattering ○

(Total 1 mark)

Q6.

An ideal gas, initially at 300 K, is compressed to half its original volume. It is then cooled at constant volume until the pressure is restored to its initial value.

What is the final temperature of the gas?

A 150 K ○

B 200 K ○

C 300 K ○

D 600 K ○

(Total 1 mark)

Q7.

A fixed volume of an ideal gas is heated.

Which row gives quantities that double when the kelvin temperature of the gas doubles?

A	rms speed of the molecules	pressure of the gas	⬭
B	density of the gas	rms speed of the molecules	⬭
C	internal energy of the gas	density of the gas	⬭
D	pressure of the gas	internal energy of the gas	⬭

(Total 1 mark)