4 **(a)** Explain what is meant by an *ideal gas*.

.....

.....[1]

(b) A fixed mass of ideal gas has a volume of 210 cm^3 at pressure 3.0×10^5 Pa and a temperature of 35 °C.

(i) State and explain the assumption of the kinetic theory that allows a gas to maintain its temperature.

.....

.....

.....[2]

(ii) The volume of the gas is then reduced at constant pressure to 140 cm^3 by a moving piston. Determine the final temperature of the gas.

temperature of gas = ... K [2]

(iii) Calculate the average kinetic energy of a gas molecule at this final temperature.

average kinetic energy = ... J [2]

(iv) Using the first law of thermodynamics, explain whether heat is supplied to or released by the gas.

.....

.....

.....[2]

[Total: 9]