4 Fig. 4.1 shows gas trapped in a cylinder by a piston.

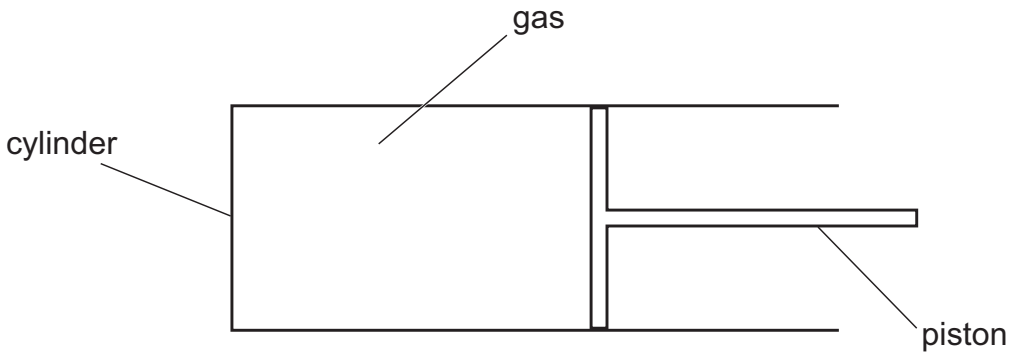

Fig. 4.1

(a) The volume of gas is 240 cm^3.
The piston is pushed to the left and is held in its new position.

(i) The pressure of the gas increases from 1.0×10^5 Pa to 1.4×10^5 Pa.

The temperature of the gas remains constant.

Calculate the volume of the gas when the piston is in its new position.

volume = ... cm^3 [3]

(ii) The area of the piston in contact with the gas is 1.9×10^{-3} m^2.

Calculate the force exerted on the piston by the gas when the piston is held in its new position.

force = ... [2]

(iii) The distance moved by the piston is 0.036 m. The average force exerted by the piston as it moves is 220 N.

Calculate the mechanical work done by the piston. State the equation you use.

work done = ... [2]

(b) Explain, in terms of particles, why gases can be compressed but liquids cannot.

.....

.....

..... [1]

[Total: 8]