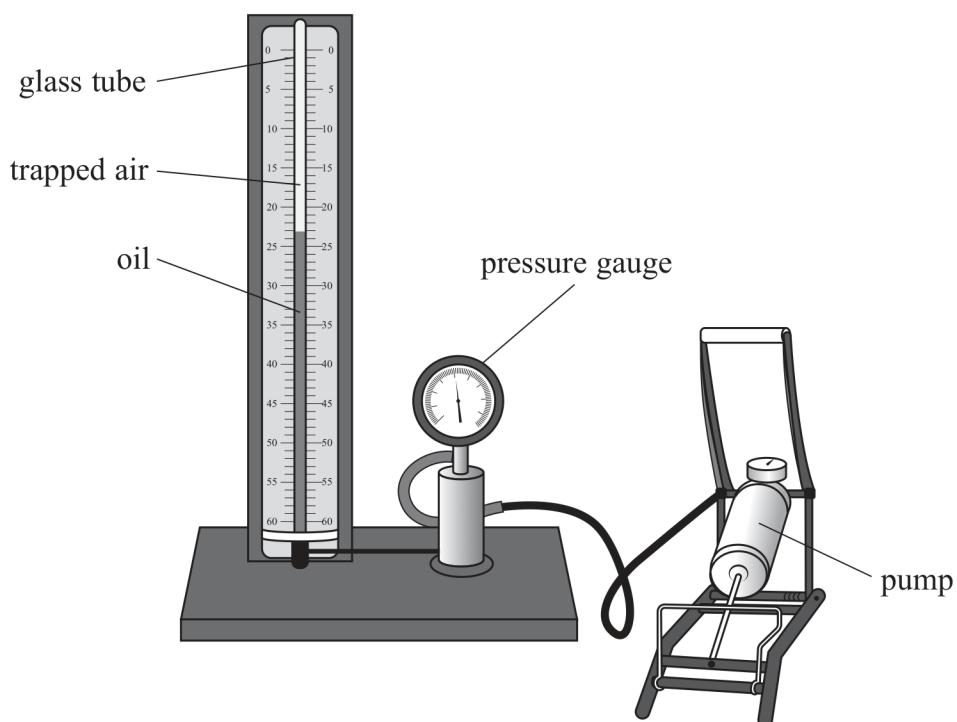## SECTION B

Answer ALL questions in the spaces provided.

11 The school apparatus shown is used to demonstrate a gas law.

glass tube

trapped air

oil

pressure gauge

pump

Air is trapped in a glass tube of uniform cross-sectional area. A pump forces oil into the base of the glass tube. This forces the air into a smaller volume. The pressure of the trapped air is displayed on the pressure gauge.

(a) The pressure of the trapped air increases when the air is forced into a smaller volume.

Explain why, using ideas of molecular motion.

(4)

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(b) The apparatus is used in a laboratory where the temperature is 293 K.

When the air occupies a volume of $2.43 \times 10^{-3}\,m^3$ the reading on the pressure gauge is $1.05 \times 10^5\,Pa$.

Calculate the number of molecules of air trapped in the glass tube.

(2)

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....

....

Number of molecules of air = ...

(Total for Question 11 = 6 marks)