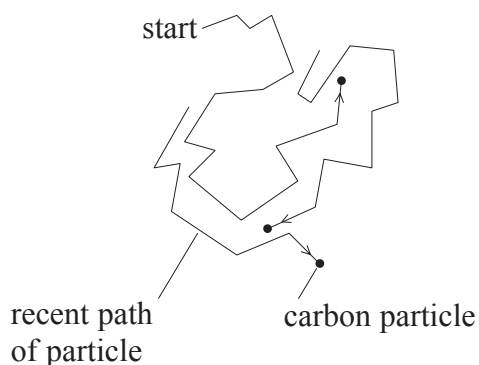


4. When tiny grains of carbon are placed in water, they move. They change speed and direction without hitting each other. The diagram shows the paths of some grains of carbon.



not to scale

(a) Describe the direction of the force on a grain of carbon needed to make it:

(i) speed up in its direction of motion.

..... (1)

(ii) stop moving.

..... (1)

(iii) change direction.

..... (1)

(b) Einstein's explanation of the motion of the grains of carbon is that:

- they are being hit by some other particles
- these other particles must be very tiny
- the other particles must be moving very fast

Suggest why Einstein thought that:

(i) the carbon grains are being hit by other particles.

..... (1)

(ii) these other particles must be very tiny.

..... (1)

(iii) the other particles must be moving very fast.

..... (1)

- (c) The particles in a gas move in a similar way to those that cause the motion of the grains of carbon.
Explain how a gas exerts pressure.

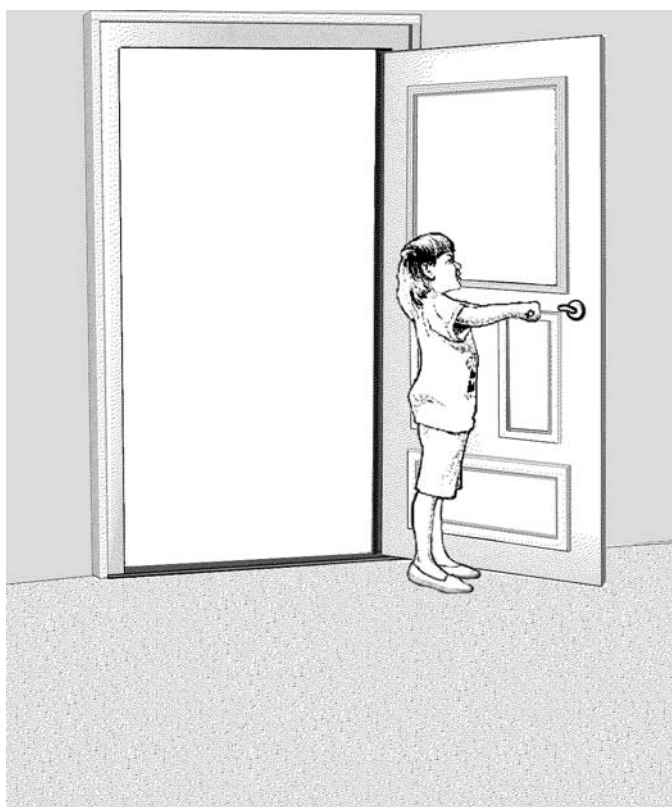
.....
.....

(2)

(Total 8 marks)

Q4

5. Pauline walks across a nylon carpet towards a door.



Explain why she gets a shock when she touches the metal door handle but not when she touches the wooden door.

You may add to the diagram to help to make your answer clear.



.....
.....
.....
.....

(3)

(Total 3 marks)

Q5