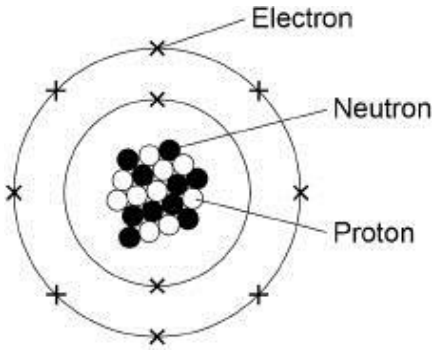
KS4 Combined Science (Trilogy) HW 3 – Atomic Structure & Distillation

Q1. The diagram below represents a neon atom.



(a) What is the name of the centre of the atom?

……..

(1)

(b) Which particle has a positive charge?

…….

(1)

(c) Which particle has the smallest mass?

……..

(1)

(d) What is the electronic structure of neon? Use the diagram above.

……..

(1)

(e) There are 18 particles of neon in every 1 000 000 particles of air.

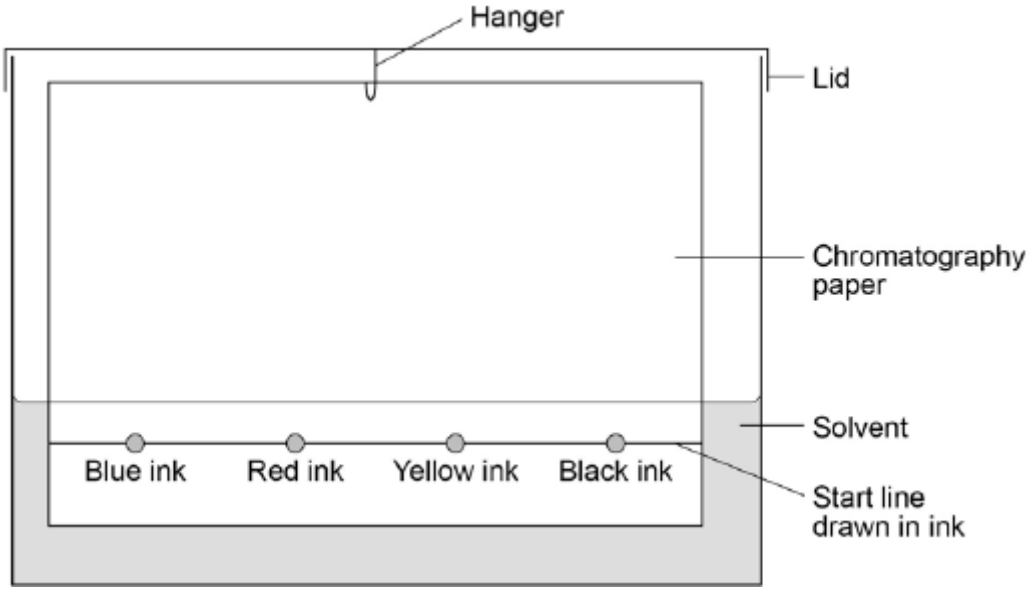
Which equation shows how to calculate the percentage of neon particles in the air?

…….

(1)

Q2. A student used paper chromatography to investigate the colours in different inks.

Diagram on next page shows the apparatus the student used.



(a) The student made **two** mistakes in setting up the apparatus. Identify the **two** mistakes.

Describe the problem each mistake would cause.

Mistake 1 _____

Problem _____

_____

Mistake 2 _____

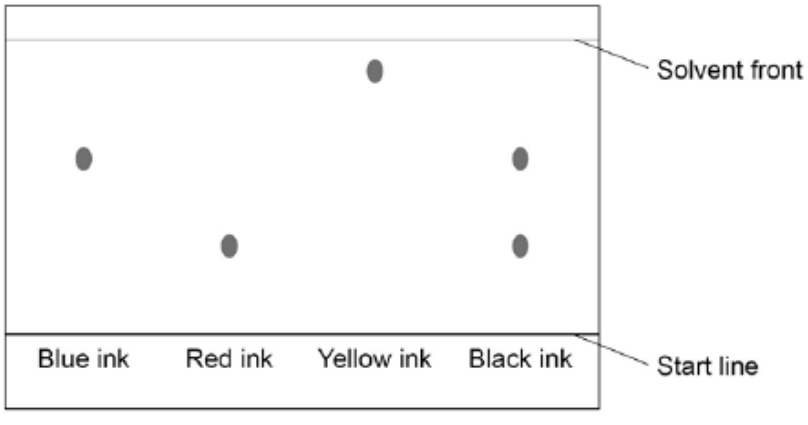
Problem _____

_____

(4)

(b) The student then set up the apparatus without making any mistakes.

Diagram below shows his results.



What colours are in the black ink?

_____

_____ **(1)**

(c) Which of the inks is the most soluble in the solvent?

Give a reason for your answer.

Ink _____

Reason _____

_____ **(2)**

(d) Use **Figure above (part b)** to complete the table below, then calculate the Rf value for red ink.

	Distance in mm
Distance moved by red ink	_____
Distance from start line to solvent front	_____

The R_f value for red ink is calculated using the equation.

$$R_f = \frac{\text{distance moved by red ink from the start line}}{\text{distance moved by solvent from the start line}}$$

Give your answer to two significant figures.

_____

_____

R_f value = _____

(5)

(e) How can you tell from **Figure 2** that the R_f value for the blue ink is greater than the Rf value for the red ink?

_____

_____

(1)

(Total 13 marks)