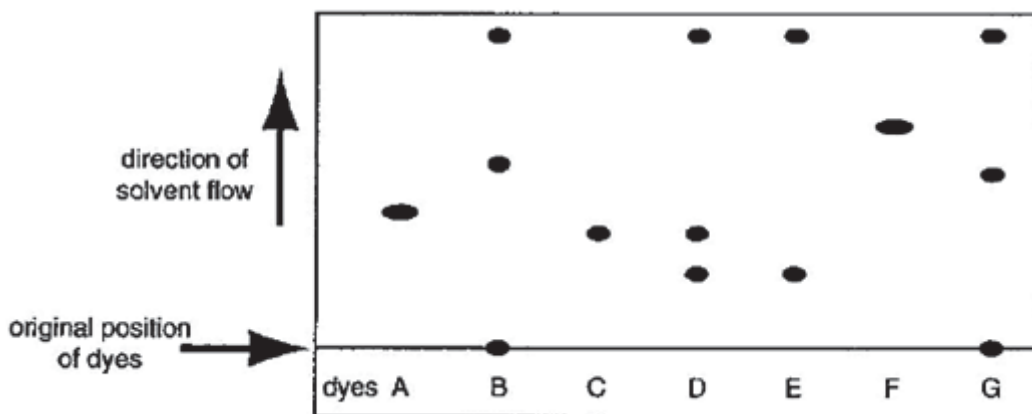


Section A

Answer **all** the questions in the spaces provided.

- 1 Paper chromatography was used to investigate a series of dyes **A**, **B**, **C**, **D**, **E**, **F** and **G**. The resulting chromatogram is shown.



- (a) Which dyes are pure substances? [1]
- (b) Which **two** dyes are the same? [1]
- (c) Which dye is a mixture of **C** and **E**? [1]
- (d) Explain why the start line should be drawn with a pencil rather than with ink.

 [1]
- 2 Methane is a gaseous hydrocarbon that burns in oxygen to form carbon dioxide and water vapour.
- (a) Write a balanced chemical equation for the reaction when methane burns in oxygen.
 [1]
- (b) Use a 'dot and cross' diagram to show the arrangement of electrons in a molecule of methane. Only the outer shell of electrons need to be shown.

[2]

- 3 The table shows five elements with their chemical symbols and proton (atomic) numbers.

element	chemical symbol	proton (atomic) number
carbon	C	6
sulfur	S	16
magnesium	Mg	12
chlorine	Cl	17
potassium	K	19

- (a) The electronic configuration of a carbon atom can be shown as 2,4.
Show how electrons are arranged in one atom of chlorine. [1]

- (b) (i) Write the symbols for a potassium ion and a sulfide ion.

potassium ion
sulfide ion [1]

- (ii) Use these symbols to write the formula of potassium sulfide. [1]

- (c) Use the copy of the Periodic Table to help you answer this question.

Hydrogen peroxide decomposes to form oxygen and water.



- (i) Calculate the relative molecular mass, M_r , of hydrogen peroxide.
Show your working.

relative molecular mass = [1]

- (ii) What do (aq) and (l) represent in the equation?

..... [1]

- (iii) Calculate the mass of hydrogen peroxide needed to produce 8 g of oxygen gas.

[2]