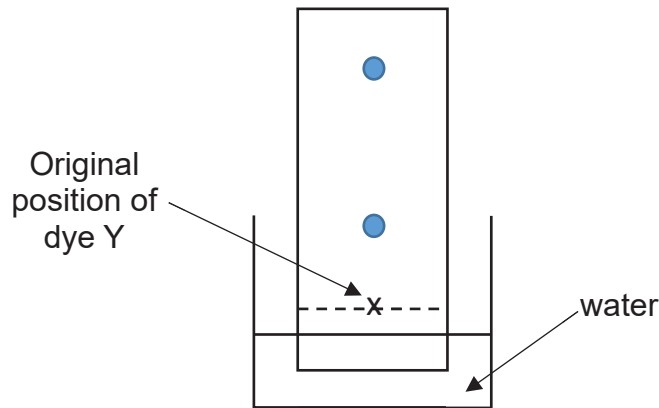


SECTION A

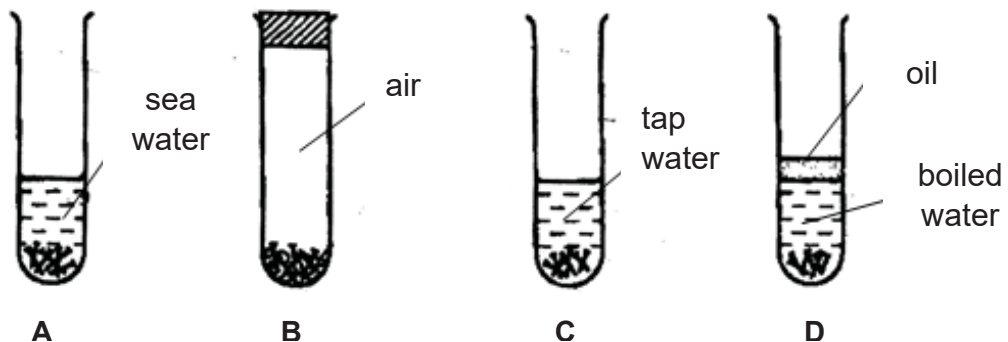
Answer **all** the questions in the spaces provided.
The total mark for this section is 14.

- A1** A drop of a dye **Y** is put on a piece of chromatography paper. The end of the paper was then dipped into a beaker of water. The results are shown below.



- (a) Is dye **Y** a mixture or compound? Give a reason for your answer.
.....[1]
- (b) Suggest why the start line must be above the water level.
.....
.....[1]

- A2** A student carried out an experiment to investigate the conditions required for iron to rust. The iron nails weighed 5.0 g at the start of the experiment. At the end of 2 weeks, the nails were removed and weighed again. It was found that their masses were 5.0 g, 5.3 g, 5.5 g and 6.0 g.



- (a) Fill in the masses of the nails in the table correctly. [1]

test tube	A	B	C	D
mass of nails after 2 weeks/g				

(b) From the experiment, write down two conditions for rusting.

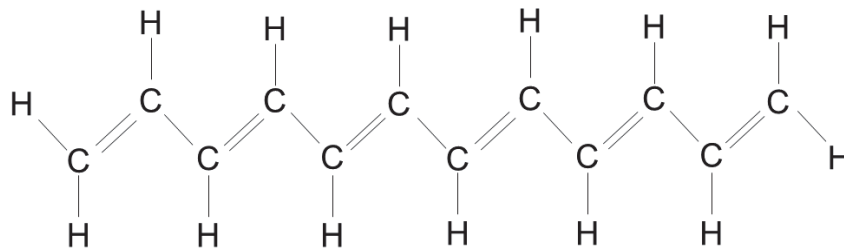
.....[1]

(c) Write down one practical way to prevent the nails from rusting.

.....[1]

A3 Vegetable oil becomes margarine through a process known as hydrogenation.

The following diagram shows the structure of a type of vegetable oil, $C_{12}H_{14}$.

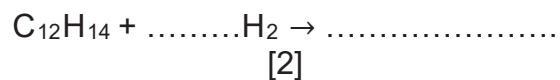


(i) With reference to the structure above, explain why $C_{12}H_{14}$ is a polyunsaturated molecule.

.....
[1]

(ii) In hydrogenation, hydrogen reacts with vegetable oil in an addition reactions to form margarine, which is a saturated hydrocarbon.

Complete and balance the chemical equation below to represent the addition of hydrogen to $C_{12}H_{14}$ to form margarine.



(iii) Describe a simple test to show that there is no longer any unsaturated $C_{12}H_{14}$ in the final product.

Test:

Observation:

.....[1]

A4 (a) Both hydrogen and helium have been used to fill balloons.

(i) Write the electronic configuration of hydrogen and helium.

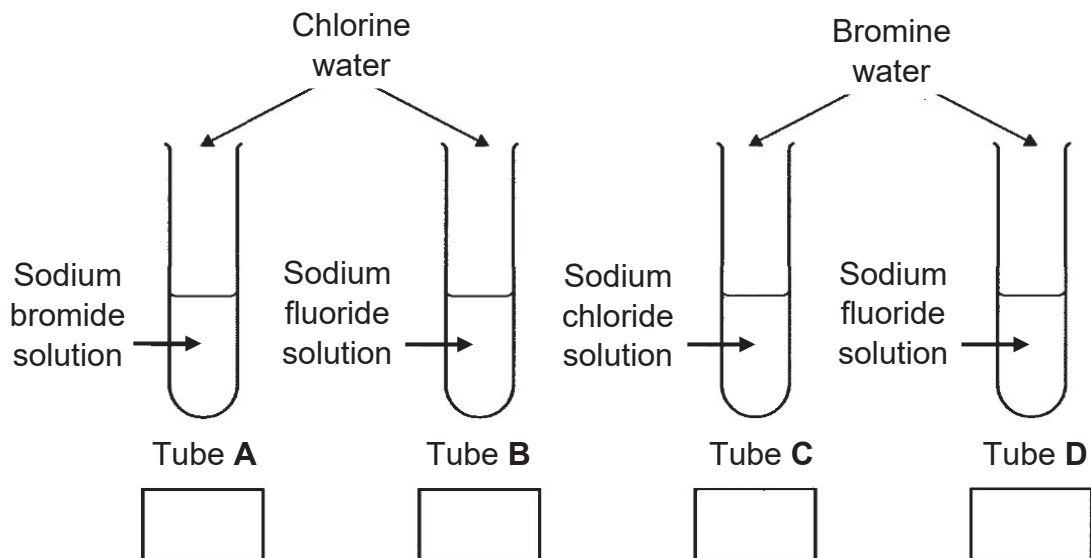
Hydrogen: Helium: [1]

(ii) Hence, suggest why helium is safer to use as compared to hydrogen.

.....

.....[1]

(b) The diagram below shows a series of experiments carried out using chlorine water and bromine water.



A positive reaction was observed in only one of the test tubes.

(i) In diagram above, put a tick (✓) in the box where a reaction was observed [1]

(ii) What would be the reaction observed in the test tube chosen in (i)?

.....[1]

(iii) Write down the balanced chemical equation for the test tube chosen in (i).

.....[1]