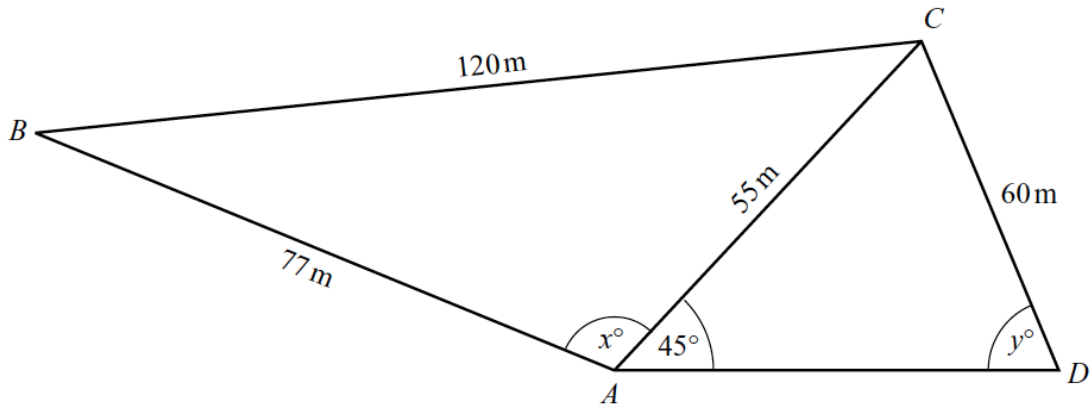
Total Marks: _____/47

**Maths**

1.




In quadrilateral ABCD, AB = 77m, BC = 120m, CD = 60m and diagonal AC = 55m.

Angle CAD = 45°, angle BAC = $x$° and angle ADC = $y$°

(a) Calculate the value of $x$. (4)

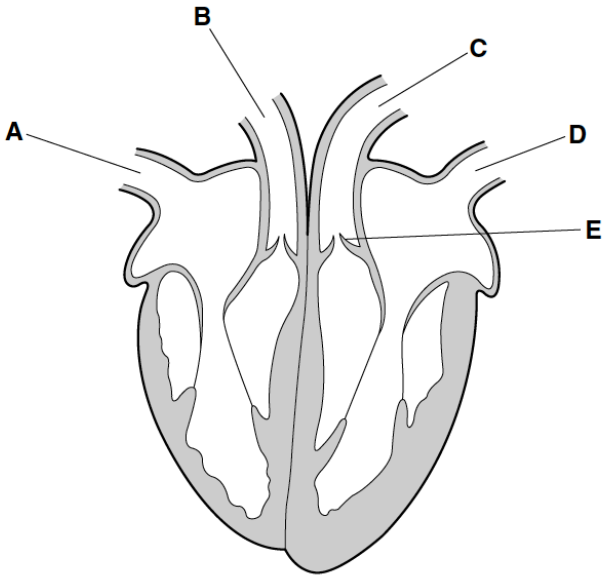
(b) Calculate the value of y. (4)

(c) The bearing of D from A is 090°.
Find the bearing of
(i) A from C, (2)

(ii) B from A (2)

Biology

2.




The above diagram shows a section through the heart.

(a) (i) Name the two blood vessels **A** and **B**. (2)

(ii) Which of the blood vessels **A, B, C** or **D** carry oxygenated blood? (1)

(iii) Name valve **E** and state it's function (2)

(b) The circulatory system of mammals is known as a double-circulatory system.
Describe what is meant by double-circulation. (3)

(d) Some poor diets can increase the risk of a heart attack.

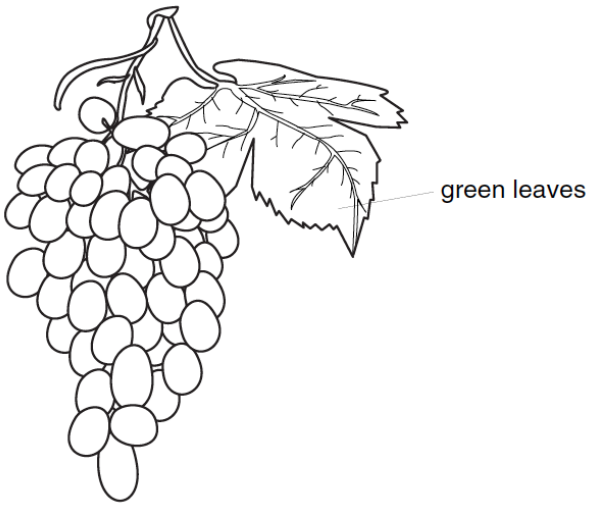
(i) Suggest two ways in which a poor diet could be changed to reduce the risk of a heart attack. (2)

(ii) Suggest two other factors, apart from diet, that could increase the risk of a heart attack. (2)

Chemistry

3.

Fermentation of sugars is one method of making ethanol. Vines produce glucose from photosynthesis. The glucose collects in the grapes which grow in clusters on the vine.




(a) Vines are attacked by a fungus that ruins the grapes. In 1882 it was discovered that spraying the vines with Bordeaux mixture killed the fungus.

The fungicide, Bordeaux mixture, contains water, calcium hydroxide and copper(II) sulphate.

(i) Name the raw material from which calcium hydroxide is made. (1)

(ii) The mixture contains four ions. Complete the list of ions. (2)

$Cu^{2+}$, $OH^-$

(iii) A different fungicide can be made by the reaction between an excess of aqueous ammonia and copper(II) salt. Describe the **observations** for this reaction. (3)

(b) Explain how the vine produces glucose by photosynthesis. (4)

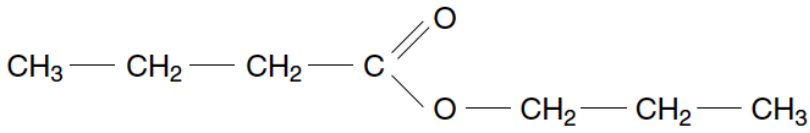
(c) The grapes are crushed to extract an aqueous solution of glucose. This solution is fermented to make ethanol. Explain why each of the following is necessary.

(i) yeast (1)

(ii) an absence of oxygen (2)

(iii) an optimum temperature of about 35°C (2)

(d) Plants can make esters as well as sugars. The formula of a typical ester is drawn below. Deduce the names of the organic acid and of the alcohol from which the ester could have been made.

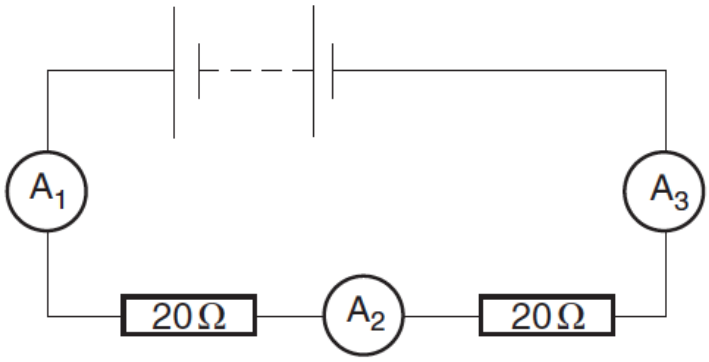



(2)

Physics

4.

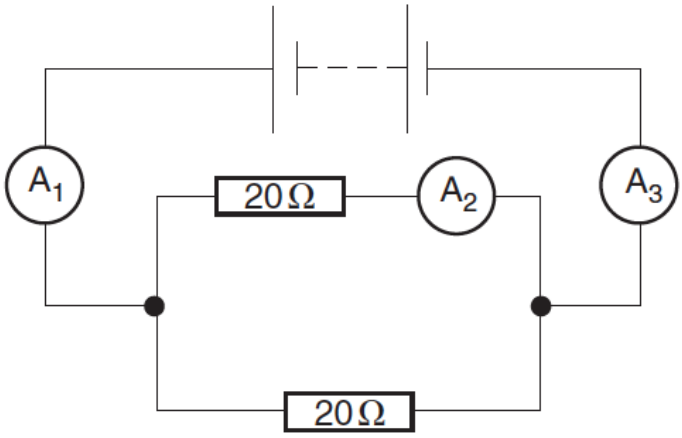
The below figure shows a circuit that includes three ammeters. The resistance of the ammeters and battery can be ignored.




(a) What is the total resistance of the circuit? (1)

(b) Ammeter $A_1$ reads 0.2A. What do the other two ammeters read? (2)

(c) The below figure shows the same components as above, but connected differently.




(i) What is the total resistance of this circuit? (1)

Ammeter $A_1$ reads 0.8A. (2)

(ii) Does $A_2$ read more than 0.8A, less than 0.8A or 0.8A?

(iii) Does $A_3$ read more than 0.8A, less than 0.8A or 0.8A?