FULL NAME:	SCIENCE TEACHER: (circle code)	**10B**

SCIENCE

Year 10 Examination 2012

10B – 80 marks

Make sure that you have answered all the questions in this paper before you start paper 10A or 10C

Time allowed for both examinations: 2 hours

Answer all questions in the spaces provided on the paper.

You may use a calculator.

Show all your working in calculations; marks are awarded for it.

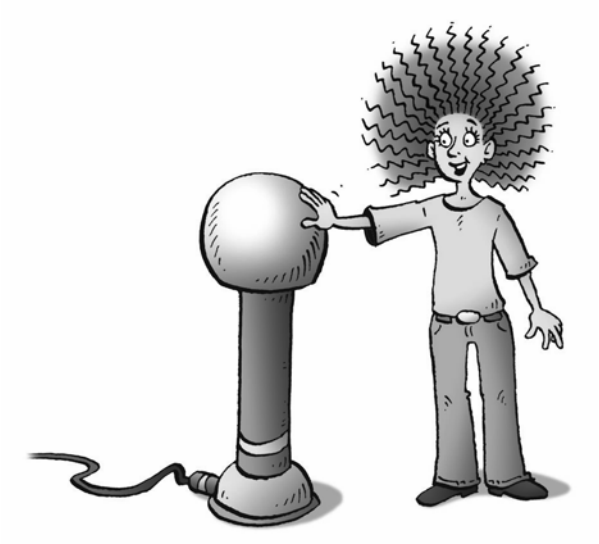
Give units for all answers (eg kg or m) unless they are already provided.

For Teacher Use

Question	m/c	1	2	3	4	5	6	7	8	9	10	11	Total
Marks gained													
Marks available	40	5	4	5	3	4	1	5	3	2	5	3	80

Question One: [5 marks]

A Van der Graaf generator (pictured) builds up a negative charge on the large dome. When Ruth placed her hands on the dome, her hair began to 'stick up'.

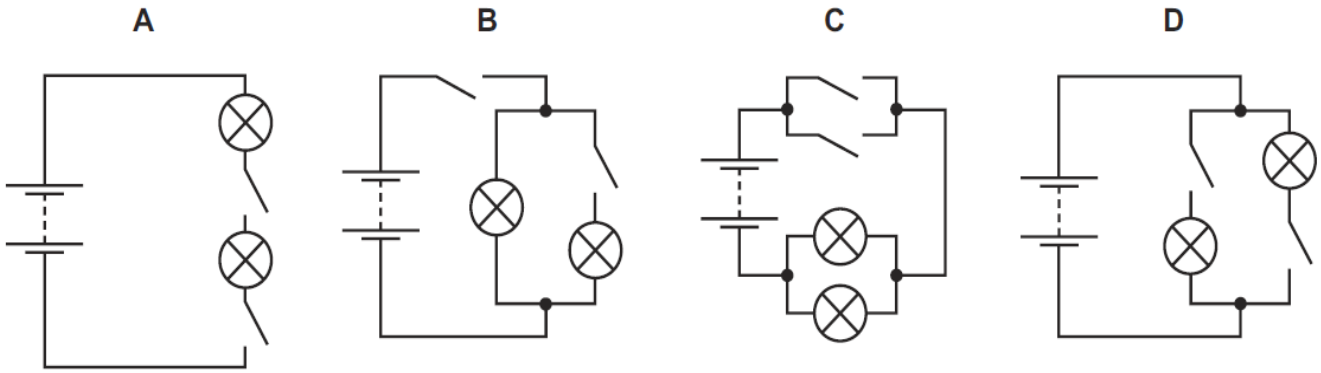


(a) What <u>type</u> of electricity makes her hair move?

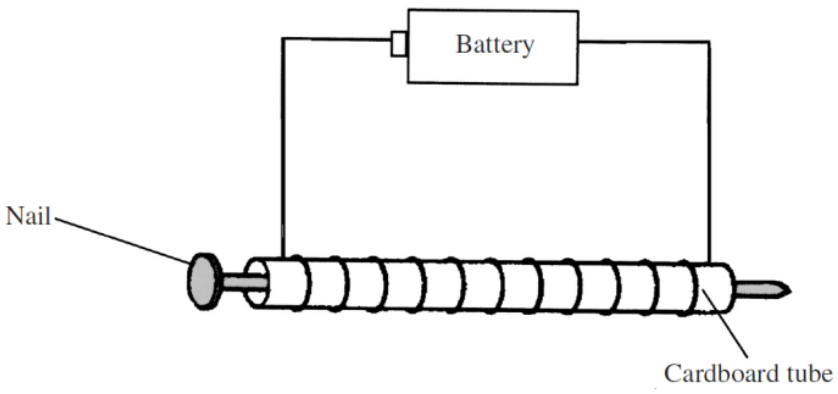
(b) Ruth rubbed an inflated balloon on her school jersey. She used this to pick up little pieces of paper. Explain why this happens.

The Science class then made some electrical circuits.

(c) Which circuit can switch the lamps on and off <u>one at a time</u>? Circle your answer.



Sarah made an electromagnet for her younger brother to play with. It consisted of a length of wire coiled around a cardboard tube. An iron nail was placed in the centre of the cardboard tube, as shown in the diagram below.



(d) State an advantage of an electromagnet over a permanent magnet.

(e) Sarah's brother wants a stronger magnet than the one she has made. State two ways she can make the electromagnet stronger.

1.
2.

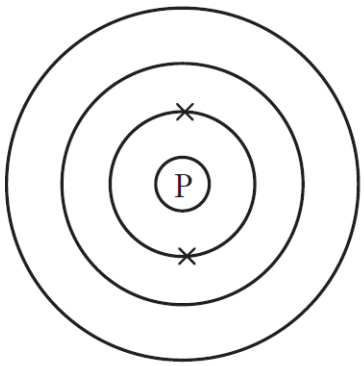
(f) Why is the iron nail useful in making a <u>good</u> electromagnet?

Question Two [4 marks]

Phosphorus is a chemical element with an atomic number of 15.

(a) What is meant by the term **atomic number**

(b) Complete the diagram to show how the electrons are arranged in an atom of phosphorus.

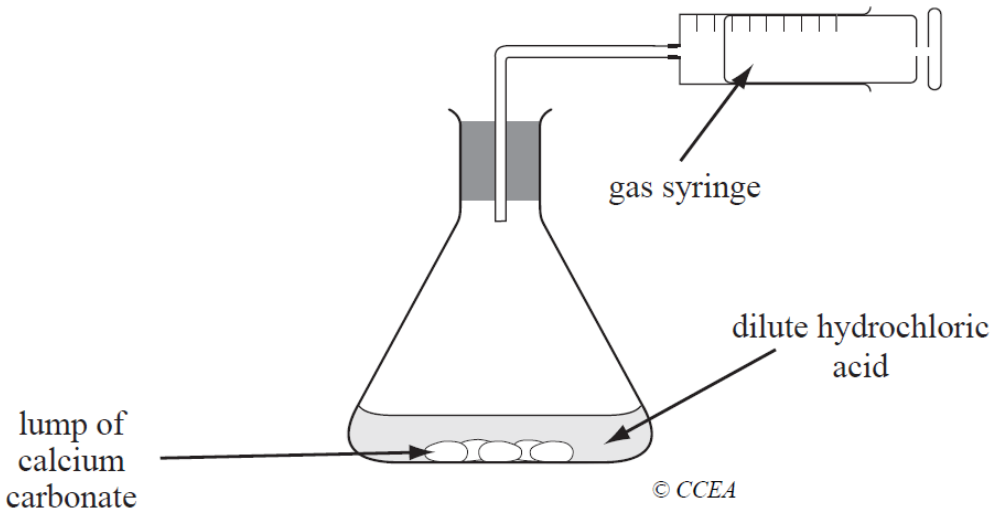


(c) Explain what the word **element** means.

(d) Nitrogen is a different element to phosphorous. It has an atomic number of 7. Give <u>one</u> thing they have in common.

Question Three [5 marks]

The diagram shows the apparatus used to investigate the reaction between a lump of calcium carbonate and dilute hydrochloric acid.



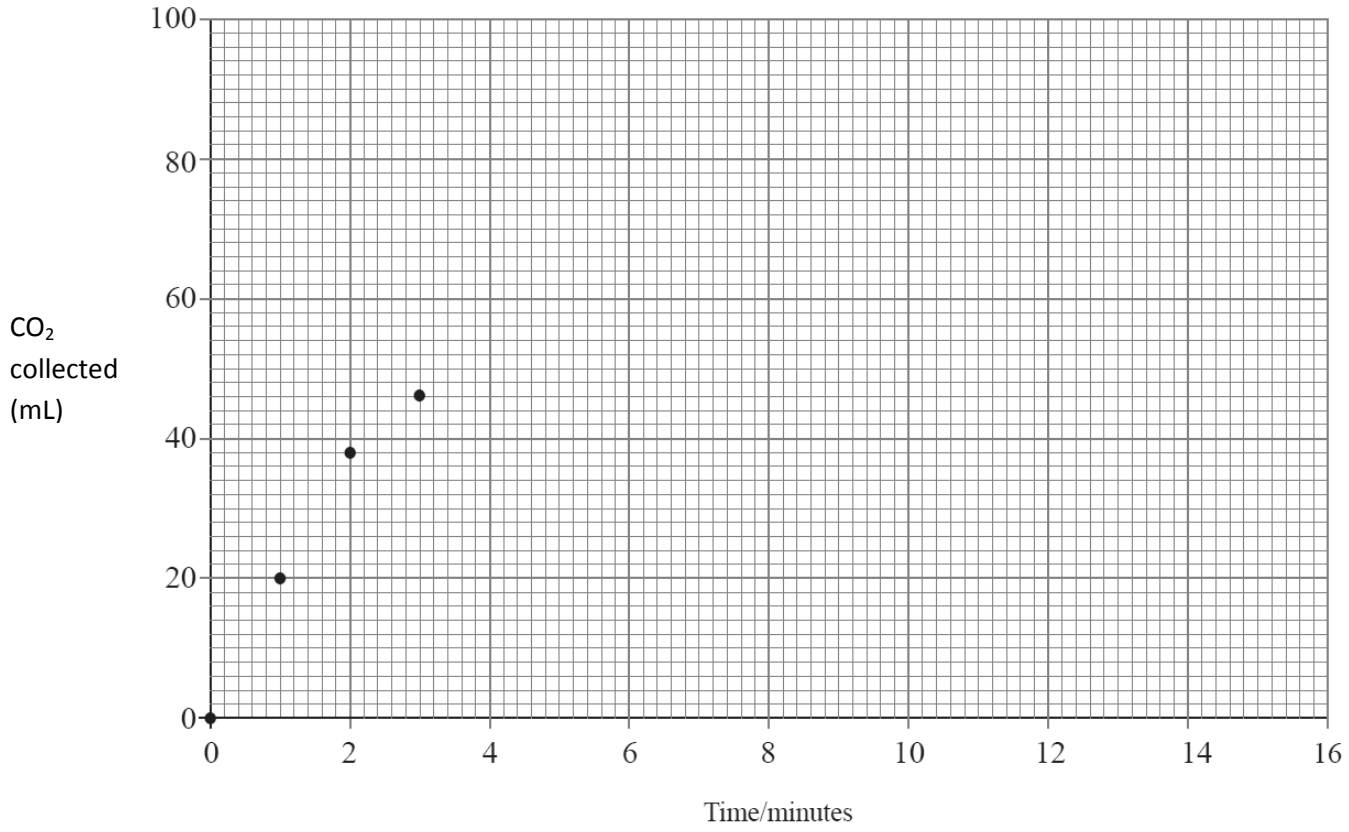
John recorded the total volume of carbon dioxide collected at intervals over 15 minutes.

At the end of the reaction there was some calcium carbonate left in the flask.

John obtained the following results:

Time (minutes)	0	1	2	3	5	7	9	11	13	15
Carbon dioxide (mL collected)	0	20	38	46	62	72	78	82	82	82

(a) Complete the graph by plotting the remaining points and join these points to form a smooth curve.



(b) A student says "the volume of carbon dioxide increases as time increases. Are they correct? Explain your answer.

(c) To make the results more reliable John should;

Tick one.

- ❑ do the experiment for a longer period
- ❑ use stronger acid
- ❑ repeat the experiment at least once

(d) Complete the word equation for this reaction.

Calcium carbonate + hydrochloric acid →

Question Four [3 marks]

Weathering can be either mechanical/physical or chemical.

(a) What is meant by the term weathering.

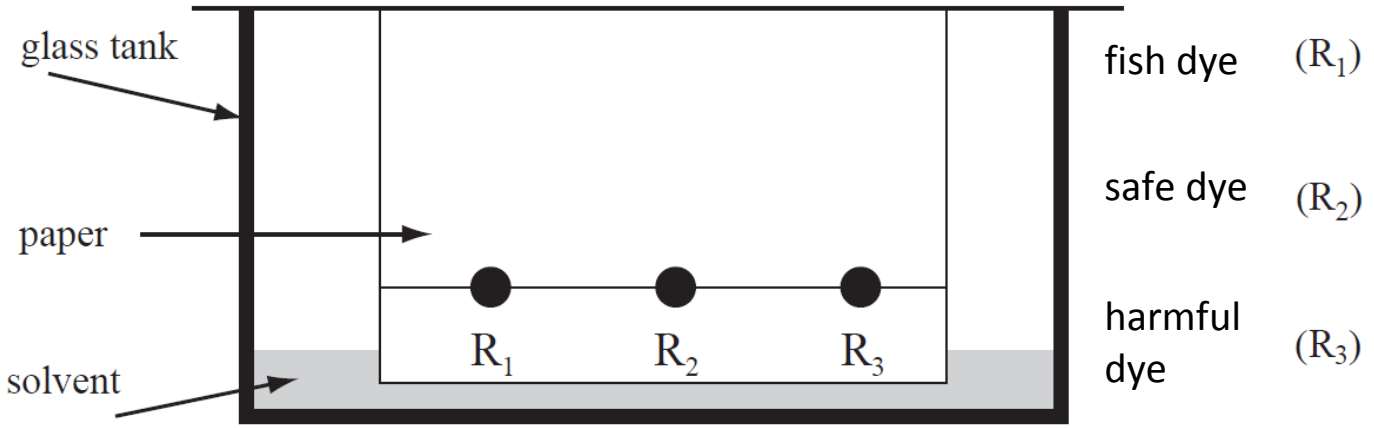
(b) Using the following list, place the different types of weathering in their correct box.

wind ● water ● acid rain ● waves ● air/oxygen ● glaciers

Mechanical/physical weathering	Chemical weathering

Question Five [4 marks]

Salmon bred at a fish farm have a red dye added to their food to improve their appearance. Paul was asked to investigate this dye to make sure it was safe. He was given two other red dyes for comparison and the apparatus below.

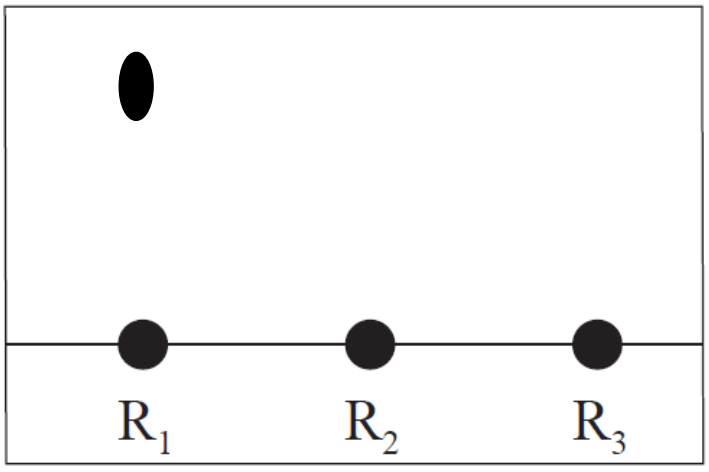


(a) What name is given to this separation technique?

(b) Describe the steps Paul would take to carry out this test.

Paul found that the fish dye (R1) was the same as the harmful dye (R3). R2 was found to be the least soluble dye and each dye was found to be a single colour.

(c) Complete the diagram below to show the **relative positions of all three dyes** after the experiment.



Question Six [1 mark]

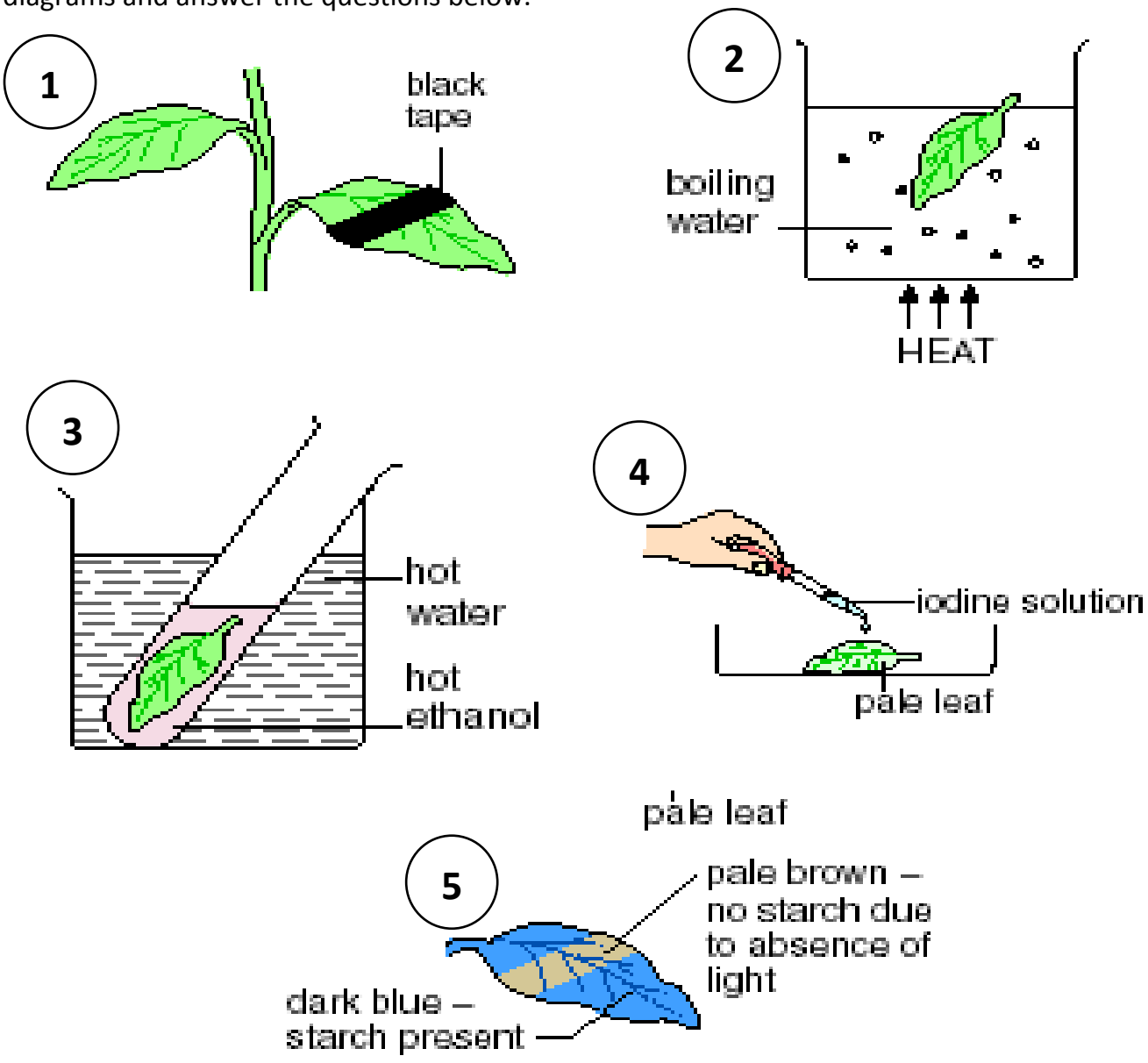
We eat many complex foods which contain mixtures of carbohydrates, fats and proteins. Food tests enable you to find out what food types a food contains.

Complete the table below.

Test for	Reagent used	Positive test
Carbohydrate – Starch	Iodine solution	**(a)**
Carbohydrate – Glucose	**(b)**	Orange/red precipitate
Protein	Biuret reagent	**(c)**

Question Seven [5 marks]

The diagrams below show the five steps used to test a green plant leaf for starch. Study the diagrams and answer the questions below.



(a) Explain why the leaf is placed in boiling water in **step 2.**

(b) Explain why the leaf is placed in hot ethanol in **step 3.**

Testing a leaf for starch is used to prove to that a plant is carrying out photosynthesis.

(c) How does the starch show that the leaf has been photosynthesising?

(d) How is light involved in photosynthesis? Use the information in the diagrams above to explain your answer.

Question 8 [3 marks]

Study the diagram below and answer the following questions.

(a) The diagram shows bees involved in pollination of the flowers. State another method, other than using animals, which plants use for pollination.

(b) The diagram above shows seeds being dispersed (moved away) by the wind. State two other ways in which seeds can be dispersed.

1.
2.

(c) Give two reasons why it is important for seeds to be dispersed.

1.
2.

Question Nine [2 marks]

(a) Red litmus paper is separately put into hydrochloric acid, water and sodium hydroxide solutions. It only changes colour in one of the solutions.

W**hich substance does it changes colour in** and what is the **final colour of the litmus.**

(b) Black tea and coffee both have a pH of around 5, whereas milk has a pH of 6.5.
Explain what would happen to the **pH** and **acidity** of the coffee or tea as you added some milk.

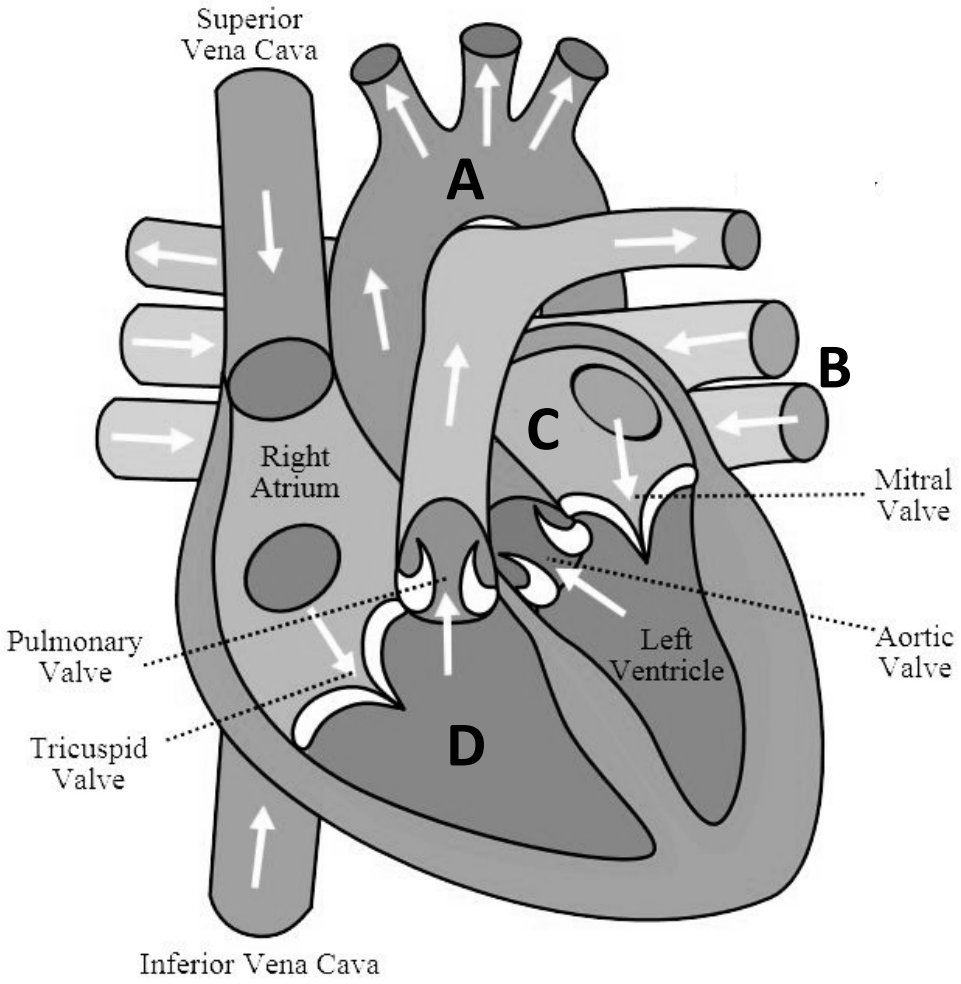
Question 10 [5 marks]

(a) There are three main types of blood vessels: arteries, veins and capillaries. Compare and contrast **TWO** of these. You could use the following ideas to help you.

● vessel wall ● size ● carries blood to…● carries blood from... ●
● contains lots of.. ● contains little … ●

You may also like to include diagrams in your answer.

(b) Using the diagram, label the parts A – D.



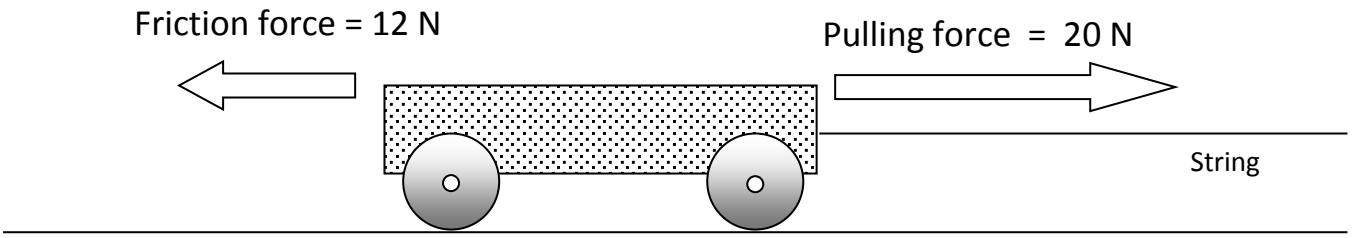
Part	Name of part
A	
B	
C	
D	

(c) Describe the functions (jobs) of the following parts:

1. Pulmonary artery
2. Vena Cava

Question Eleven [3 marks]

Connie was pulling a trolley across the lab bench with a string and Sam was measuring how fast it was going. A diagram showing the two horizontal forces operating on the trolley is drawn below.



(a) Calculate the resultant horizontal force acting on the trolley.

(b) Describe the motion of the trolley, including the direction it moves.

(c) If a piece of dirt got stuck in one of the wheels and caused the **friction force** to increase to 14N, how would this affect the motion of the trolley? Explain your answer.

END OF PAPER B

NOW DO PAPER A OR C