FULL NAME:	SCIENCE TEACHER:	**10B**

SCIENCE

Year 10 Examination 2010

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*	*Total*
Marks gained										
Marks available	*40*	*3*	*7*	*4*	*4*	*8*	*5*	*5*	*4*	*80*

Question One [3 marks]

Use this table to answer the questions.

Era	Geological period	Millions of years ago	First evidence of:
Cenozoic	Quaternary Tertiary	2 65	humans primates
Mesozoic	Cretaceous Jurassic Triassic	140 180 245	flowering plants birds, flying reptiles mammals
Palaeozoic	Permian Carboniferous Devonian Silurian Ordovician Cambrian	275 350 410 430 500 600	dinosaurs reptiles, winged insects amphibians insects fish animals with shells
Proterozoic	Precambrian Archaeozoic Azoic	2700 3500 4600	fungi, protozoans algae, bacteria no life

(a) Circle the most recent **era**?

Palaeozic **Mesozoic** **Cenozoic** **Proterozic**

(b) How many millions of years ago did dinosaurs first appear?

(c) During which geological period did fish first appear?

(d) What life form first appeared 410 million years ago?

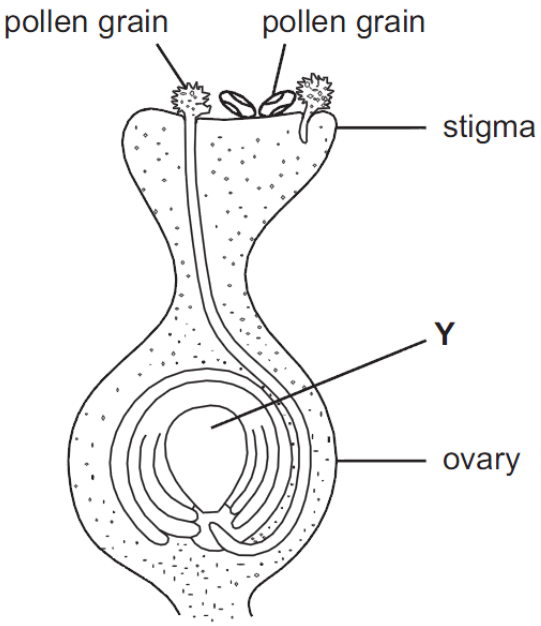
(e) Which appeared first, fish or insects?

(f) Put in order – from **oldest to youngest** – the appearance of: amphibians, primates, mammals and reptiles

OLDEST					YOUNGEST

Question Two [7 marks]

The diagram shows two pollen tubes growing from pollen grains on the stigma of an insect-pollinated flower.



(a) On the diagram, use a label line to carefully label a pollen tube with an **X**.

(b) The male reproductive cell moves down the pollen tube. Describe what happens when it reaches the part labeled Y.

(c) Two of the pollen grains shown in the diagram have not grown pollen tubes. These pollen grains were blown by the wind onto the stigma of this flower from a **wind pollinated** species of plant.

State two ways in which the **flower** from which these pollen grains were blown would differ from the insect pollinated flower.

(i)
(ii)

(d) After the events shown in the diagram, ovaries develop into fruits, which help to disperse the seeds inside them. Describe a feature of **any fruit** that is dispersed by animals **and** explain how it is adapted for animal dispersal. Draw a diagram if it helps explain your answer.

A student carried out an experiment to find out what conditions some lettuce seeds needed in order to germinate. 10 seeds were used in experiments A – E. The table shows his results.

set of seeds	air present	soil present	water present	light present	did the seeds germinate?
A	yes	yes	yes	yes	yes
B	no	yes	yes	yes	no
C	yes	no	yes	yes	yes
D	yes	yes	no	yes	no
E	yes	yes	yes	no	no

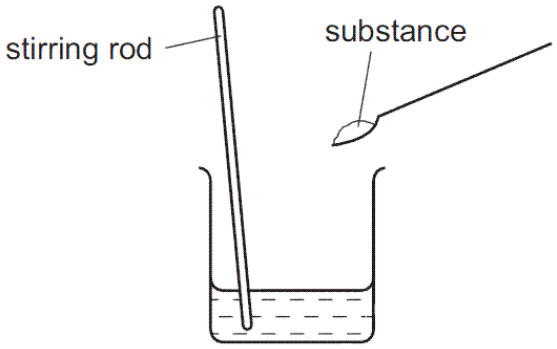
(e) Which 3 conditions did the lettuce seeds need for germination?

-
-
-

(f) Discuss **one** factor that the student should have kept constant in his experiment.

Question Three [4 marks]

A student added equal amounts of four substances, A, B, C and D, to four separate beakers each with 25 mL of dilute sulfuric acid as shown.



The observations which the student made are shown.

substance	observations	pH of the mixture after any reaction is complete
A	• gas given off which turns limewater milky • colourless solution formed	2
B	• gas given off which turns limewater milky • blue solution formed	3
C	• gas given off which burns with a squeaky pop when ignited • colourless solution formed	3
D	• no gas given off • blue solution formed	4

(a) Circle & explain which experiment neutralised the greatest amount of acid.

A **B** **C** **D**

Explanation:

(b) Circle & explain which one of substances A, B, C or D could have been magnesium carbonate.

A **B** **C** **D**

Explanation:

(c) Circle & explain which one of substances A, B, C or D has reacted with sulfuric acid according to the equation below.

$$H_2SO_4 + CuO \rightarrow CuSO_4 + H_2O$$

A **B** **C** **D**

Explanation:

Question Four [4 marks]

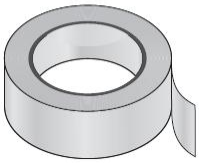
A Scenes of Crime Officer (SOCO) investigated a crime scene. The diagrams show the equipment she might have used to collect the evidence found at the crime scene.

cotton swab

plaster of Paris

scalpel

tweezers



sticky tape

(a) Complete the table to show which equipment she used to collect each of the pieces of evidence found at the crime scene.

Evidence found	Equipment used to collect the Evidence
Dried blood	
Hair	
Wet blood	
Fingerprints	

(b) Some methods used in forensic science are listed below.

A DNA profiling	B Using a light microscope
C Paper chromatography	D Using database records
E Flame tests	F Measuring refractive index

Which method is most likely to be used in each of the following investigations? Write the letter. (One won't be used).

(a)	Matching a fibre from the crime scene with a fibre from a suspects clothing	
(b)	Matching two pieces of broken glass	
(c)	Detecting forgery by comparing two samples of ink	
(d)	Proving that a man is the father of a child	
(e)	Using a description of teeth to identify a dead body	

Question Five [8 Marks]

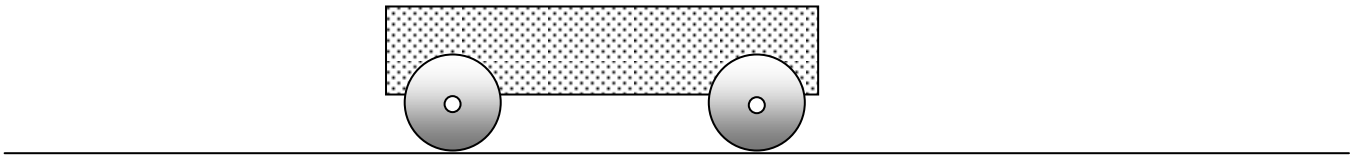
(a) Explain the difference between mass and weight.

(b) Near the surface of the earth, the pull of gravity is about 10 N on each kilogram.

(i) What is the name for the unit represented by N?

(ii) What is your weight if your body has a mass of 55 kg?

When sliding a heavy trolley along the ground you need to overcome friction.

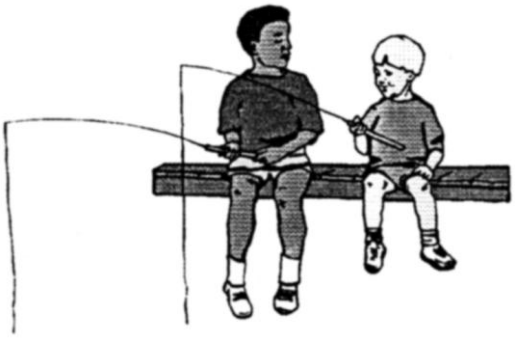


(c) If the frictional force acting against a trolley is 110 N, what is the **size** and **direction** of the resultant force in each of the following cases?

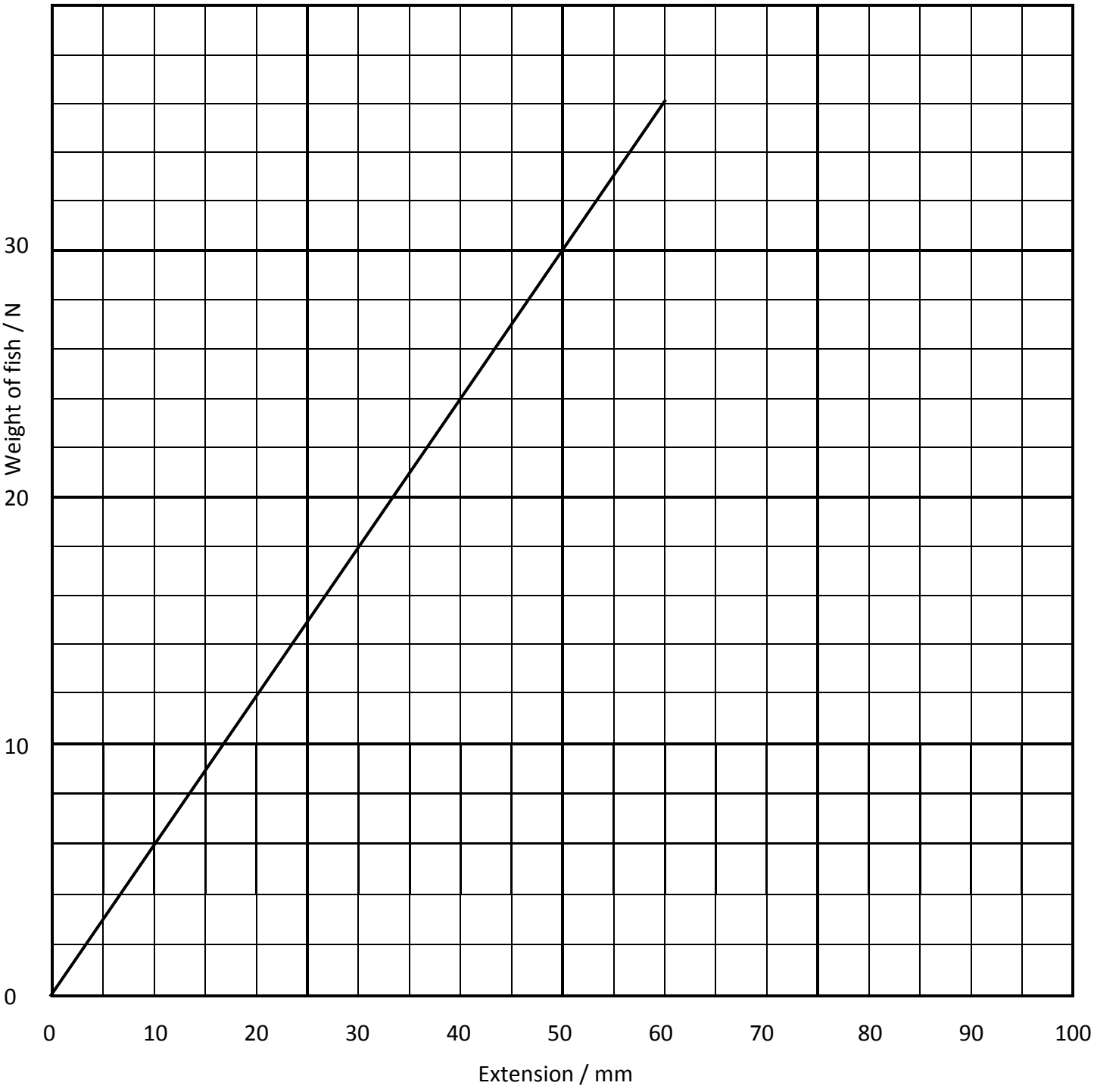
(i) one man pushes the trolley with a force of 110 N to the right.

(ii) two men push the trolley with a combined force of 210 N to the right.

Boy and Neil went fishing. They each weighed the fish they had caught on their own Newton balances. The extension of the spring inside each balance was also measured.



Boy's results are shown on the graph below.



(d) If Boy caught another fish, which gave an extension of 40 mm, what would its weight be?

(e) The weights and extensions for Neil's fish are shown in the table below.

Weight of fish (N)	5.0	9.0	16.0	20.0	20.5
Extension (mm)	20	36	64	88	100

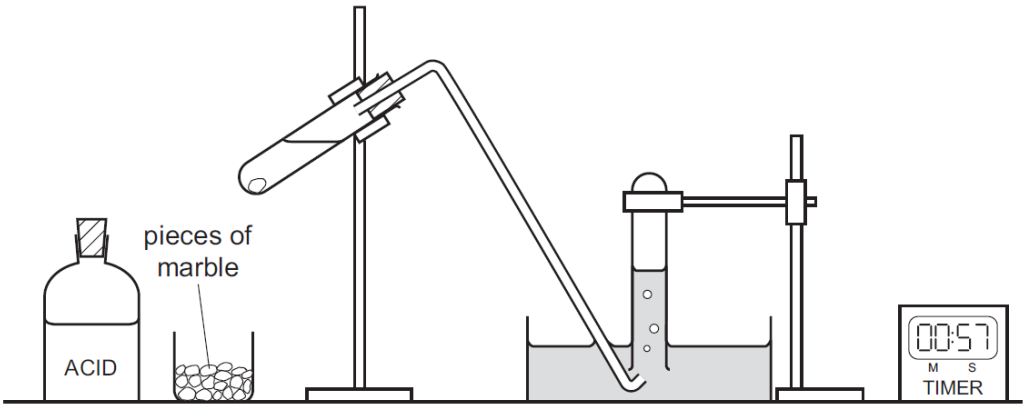
(i) Plot these points **on the same axes**.

(ii) The type of balance Neil is using could be used to weigh other objects. What is the **maximum weight**, which could be *reliably measured* on this balance.

Question Six: [5 Marks]

A series of experiments was done to find out how temperature change affects the speed of reaction.

Marble (calcium carbonate) was reacted with dilute hydrochloric acid at different temperatures.



A test-tube was half-filled with dilute hydrochloric acid.

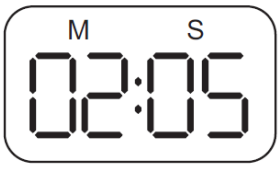
- The acid was gently warmed and its temperature was recorded.
- A small piece of marble was placed in the tube and the cork was quickly replaced.
- A digital clock was started.
- When the gas collection tube was full, the clock was stopped.

experiment number	1	2	3	4
temperature / °C	24	37	49	62
time taken / s	148			22

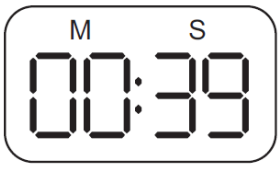
(a) Name two more pieces of apparatus, not shown, that the student will need for these experiments.

(b) What must the gas collection tube be filled with, before each experiment begins?

(c) Read the digital clocks shown for the missing times, and record them in the table.



experiment 2



experiment 3

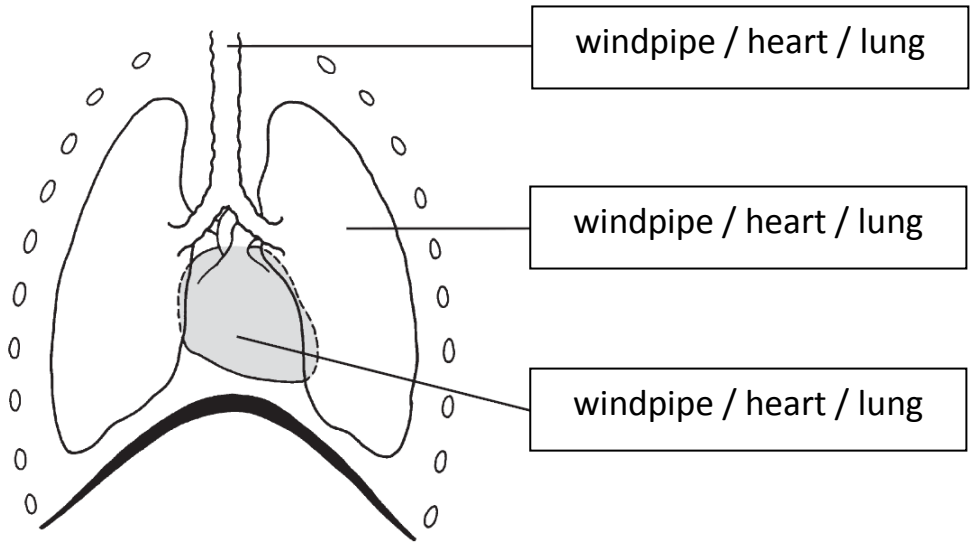
(d) Suggest one change to the method to improve the accuracy of the experiment.

(e) Use the information to show how the speed of reaction is affected by change of temperature.

Question Seven: [5 Marks]

The diagram shows parts of the body.

(a) Complete the labels by circling the correct word in each box.



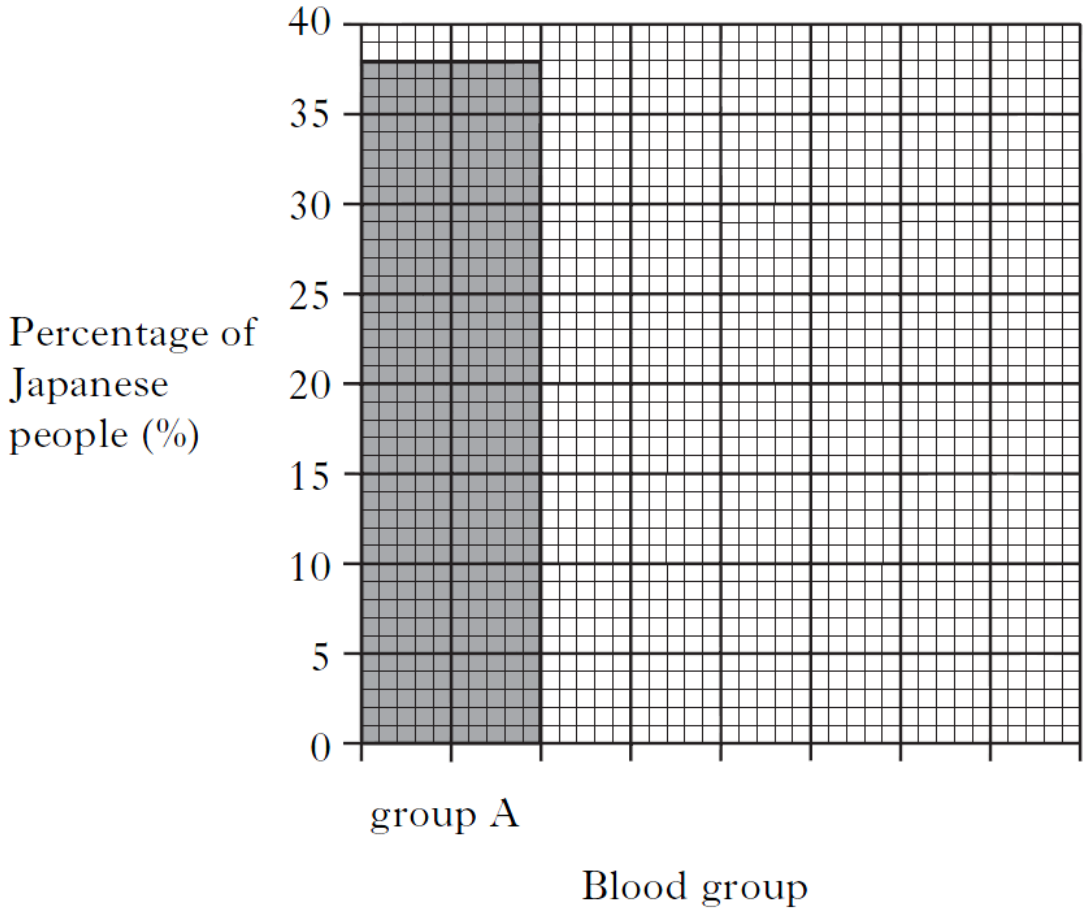
(b) What is the function of the heart?

There are four different blood groups called group A, group O, group B and group AB. For Japanese people, the most common blood group is A, with 38% having this type of blood. 30% of Japanese people have blood group O and 22% have blood group B. The remaining 10% have blood group AB.

(c) Use this information to complete the table below.

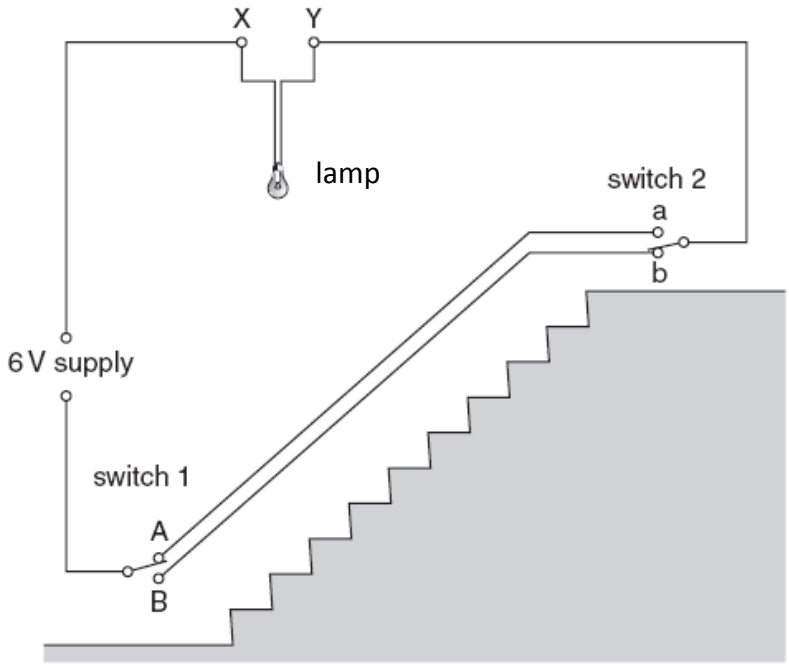
Blood group	Percentage of Japanese people (%)

(d) Use this information to complete the bar graph.



Question Eight: [4 Marks]

A toymaker wires a circuit in a toy house, so that a lamp can be switched on using either switch 1 at the bottom of the stairs or switch 2 at the top of the stairs.



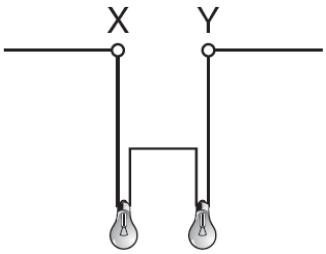
(a) When switch 1 is in position **A**, what is the position of **switch 2** so that the lamp is lit?

a or b (circle answer)

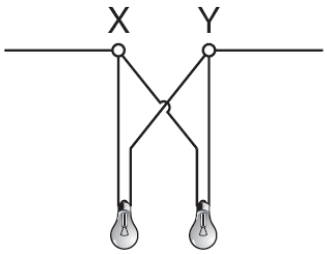
(b) When switch 2 is in position **b**, what is the position of **switch 1** so that the lamp is lit?

A or B (circle answer)

(c) The toymaker decides he wants to have two identical lamps in the circuit with the 6 V supply.



connection 1



connection 2

Which of the following means of connecting the lamps between X and Y, is the best? Give two reasons for your answer.

1.
2.

NOW CHECK YOUR ANSWERS