Science Test B

2003
40 min
40 marks

1. Playing Football

(a) Some children are playing football. They take their pulse rates before and after the game.

What does pulse rate measure?

..... 1 mark

(b) The children's pulse rates increased during the game.

Explain why their pulse rates increased as they ran.

.....

..... 1 mark

(c) The children sit down and rest after the game.

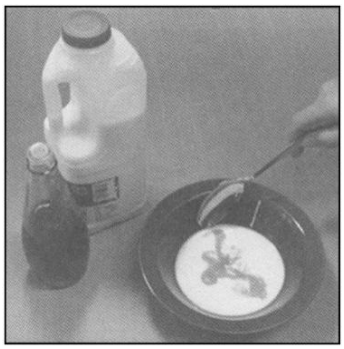
Predict what will happen to their pulse rates over the next 10 minutes.

The children's pulse rates will.....

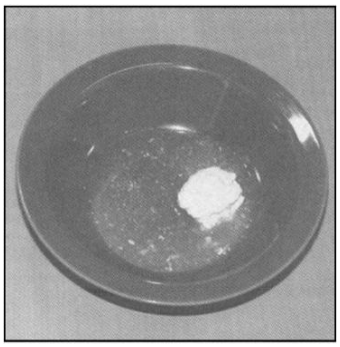
1 mark

2. Mixing Liquids

(a) Some children add vinegar to warm milk. They stir the mixture before it cools down. The mixture changes very quickly.



Before mixing: milk and vinegar



After mixing: liquid and a white solid

This change is not reversible.

Can the children get the milk and vinegar back?

Tick **ONE** box in each row.

		Yes	No
(i)	Can they get the milk back?	☐	☐
(ii)	Can they get the vinegar back?	☐	☐

1 mark

(b) Which of the following suggests that this change is **NOT** reversible?

Tick **ONE** box.

In their test...

they stirred the mixture.	☐	there was liquid left.	☐
a solid formed.	☐	the change was quick.	☐

1 mark

(c) Nizam thinks that the more vinegar they use in the mixture, the bigger the white ball will be.

Complete the sentence below to show how the children could test Nizam's idea.

Put the same amount of milk in three identical containers and then

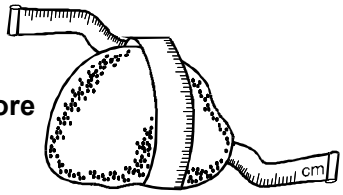
.....

.....

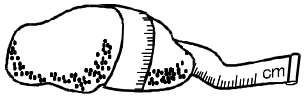
1 mark

(d) The children test Nizam's idea. They try measuring around the white balls. But the balls squash easily and the measurements change.

Before



After



What better method could they use to find out if some of the white balls are bigger than others?

.....

.....

1 mark

3. Bouncing Balls

(a) Some children found out how high a tennis ball bounces on different surfaces.

They dropped a tennis ball from a height of 100cm.

What equipment did they use to measure how high the ball bounces?

.....

1 mark

(b) They measured how high the ball bounced and recorded their results like this.

Surface	*How high ball bounced (cm)*
grass	*40*
tarmac	*51*
concrete	*61*
clay	*47*

How did the children present their results?

Tick **ONE** box.

in a graph ☐ in a bar chart ☐

in a pie chart ☐ in a table ☐

1 mark

(c) Why did they drop the ball from the same height each time?

.....

1 mark

(d) What is the **ONE** factor they **changed** as they carried out their investigation?

.....

1 mark

(e) They carried out a second investigation.

They recorded the height the **same** ball bounced when dropped from **different** heights onto the **same** surface.

Height of drop (cm)	*Height of bounce (cm)*
50	*32*
100	*62*
150	*88*
200	*115*

Use the evidence from their two investigations to suggest which surface they used for their second investigation.

Tick **ONE** box.

grass	☐	tarmac	☐
concrete	☐	clay	☐

1 mark

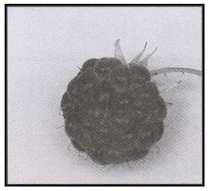
(f) Describe how the **height of the drop** affects the **height of the bounce**.

.....

.....

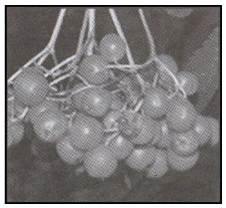
2 marks

4. Seeds



Jade looks at these berries.

Berries contain seeds.



(a) Why do plants produce seeds?

.....

.....

1 mark

(b) Tick **ONE** box to show the **main** way that birds help to disperse the seeds in these berries.

Birds shake the seeds out.	☐	Birds spread the seeds in their droppings.	☐
The seeds catch on the birds' feathers.	☐	Birds carry the seeds in their feet.	☐

1 mark

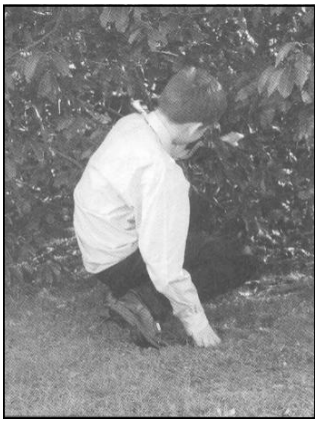
(c) Jade investigates which colour berries show up best.

She hangs different coloured beads on some green plants.

She uses the same number of beads of each colour.

Michael looks for the beads for two minutes.

Jade counts how many beads of each colour Michael finds.



Here are Jade's results.

Colour of Beads	Number found in 2 minutes
Black	19
Brown	12
Green	8
Red	25

(i) Which colour was easiest to see on the plants?

.....

1 mark

(ii) The children think that the colour of the berries might affect the number of seeds dispersed by birds.

How might the colour of berries affect the number of seeds dispersed by birds?

.....

.....

1 mark

5. Evaporation

(a) Rose knows that water and vinegar evaporate.

Tick **ONE** box to show what **evaporation** means.

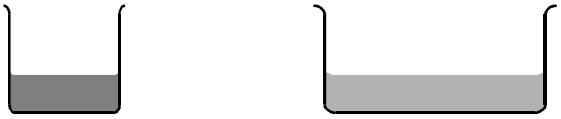
Evaporation is the change from...

gas to liquid.	☐	gas to solid.	☐
liquid to solid.	☐	liquid to gas.	☐

1 mark

(b) Rose sets up a test to find out if more water or more vinegar evaporates over 3 days.

She puts water in one container and vinegar in another container, like this:



Water **Vinegar**

Rose places both containers on the same windowsill.

(i) Use the information above to describe **ONE** thing that is not fair in her test.

.....

1 mark

(ii) Why does it matter if her test is not fair?

.....

.....

1 mark

(c) Rose changes her test to make it fair. She measures the volumes of water and vinegar twice each day to see how much has evaporated.

The table below shows her results.

Day	Time	Volume of water (cm^3)	Volume of vinegar (cm^3)
Monday	10am 3pm	100 99	100 98
Tuesday	10am 3pm	97 94	91 89
Wednesday	10am 3pm	94 86	82 80

Rose wanted to compare water and vinegar to find out which evaporated the most over 3 days.

Use Rose's results to write a conclusion for her test.

.....

.....

1 mark

(d) Rose notices that more water and vinegar evaporated between 10am and 3pm on Tuesday than between the same times on Monday or Wednesday.

Suggest **ONE** possible reason why more water and vinegar evaporated on Tuesday.

.....

1 mark

6. Planet Earth

(a) A long time ago, people thought that the Earth was flat.

Now we know that planet Earth is not flat.

What shape is planet Earth?

.....

1 mark

(b) A long time ago, scientists had different ideas about the Sun and the Earth.

Now we know that only some of their ideas are true.

Tick ONE box in each row on the table below to say whether each idea is true or false.

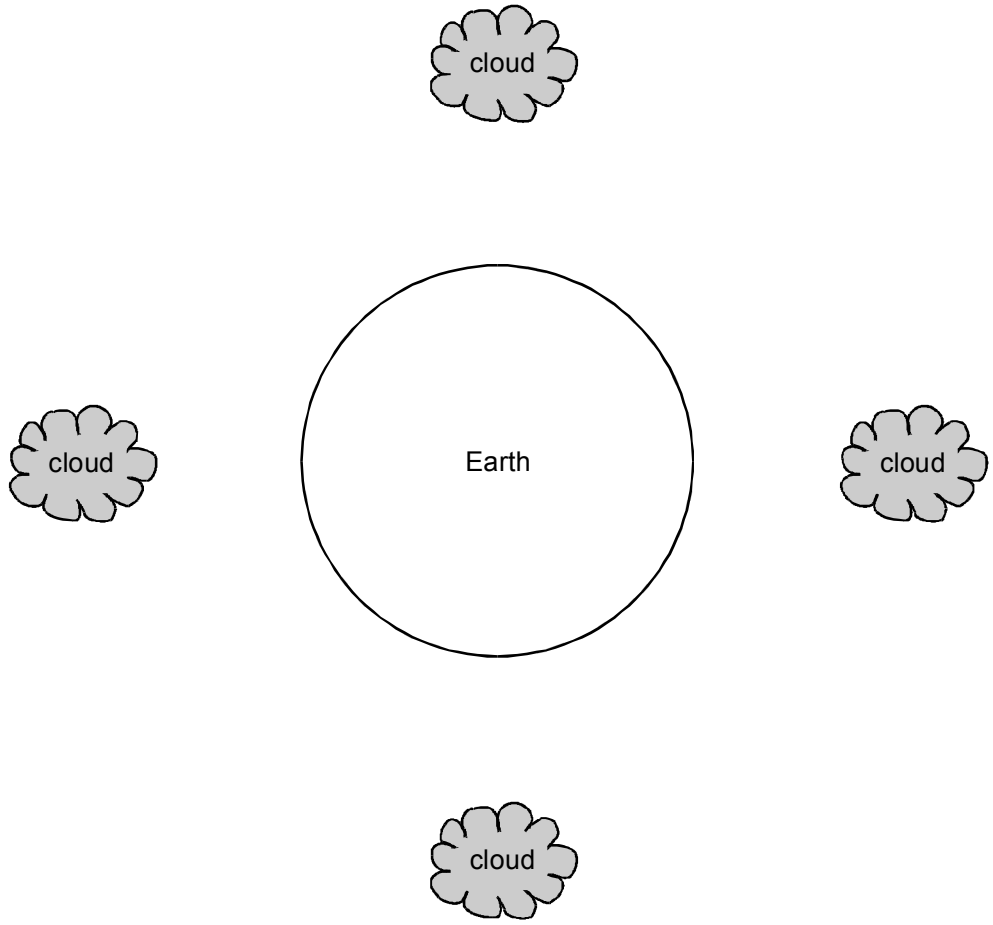
Idea	True	False
The Earth goes around the Sun.		
The Earth spins on its axis.		
The Sun is hidden behind the Moon at night.		
The Sun orbits the Earth.		
Night is dark because thick clouds cover the Sun.		

2 marks

(c) The diagram below shows clouds over different parts of the Earth.

Rain is falling from the clouds.

(ii) Draw an arrow from each cloud to show the direction of gravity acting on the rain.



1 mark

(ii) Explain why you have drawn the arrows in this way.

In your answer write about the force of gravity.

.....

.....

1 mark

7. Edward Jenner

(a) Edward Jenner was a doctor who lived a long time ago.

Jenner noticed that people who suffered from a disease called cowpox did not catch smallpox.

Smallpox is a disease that can kill people.

Picture of Edward Jenner from Senior Biology (1991), King, R.J. and Sullivan, F.M. Pearson Education, Australia.

What do we call it when someone **notices** something important like this?

Tick **ONE** box.

an observation	☐	an effect	☐
an investigation	☐	a measurement	☐

1 mark

(b) Jenner carried out a test. He used cowpox to see if it could stop people catching smallpox. He carried out his test on several people.

Why did Jenner carry out his test on several people instead of on just one person?

.....

.....

1 mark

(c) A micro-organism causes smallpox.

Why do scientists wear masks and gloves when they work with micro-organisms?

.....

1 mark

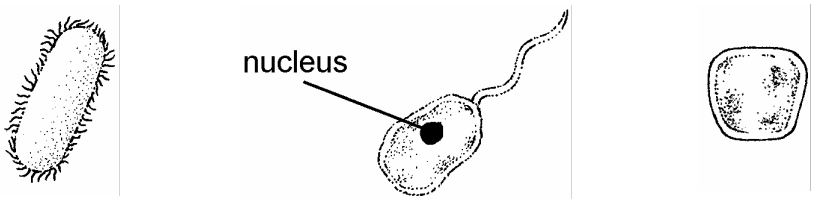
(d) There are many types of micro-organism. Some can help to prevent or cure disease.

Describe **ONE different** way in which micro-organisms can be helpful.

.....

1 mark

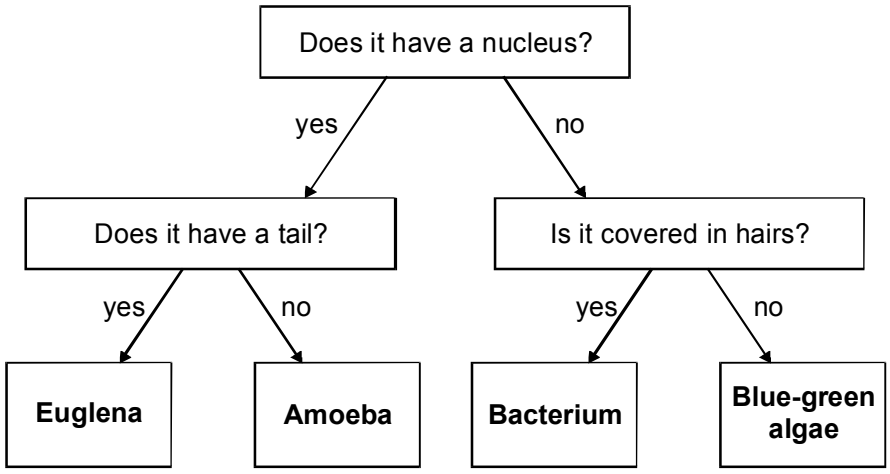
(e) The diagrams below show how three different micro-organisms look under a microscope.



A **B** **C**

Use the key below to help you identify these micro-organisms.

Write your answers under the key.



A is ..... B is .....

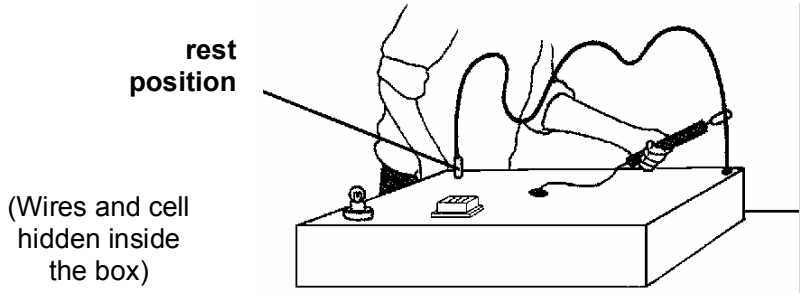
C is .....

2 marks

8. The Steady Hand Game

(a) Sita has made a game. In her game, she has to move a metal ring along a piece of thick wire until it reaches the rest position.

When she is moving it, the metal ring must not touch the wire. If it touches the wire, a bulb will light and a buzzer will make a noise.



The metal ring and the thick wire both let electricity through.

What is the scientific name for materials that let electricity through?

.....

1 mark

(b) Sita made the rest position by covering the wire with an insulating material. When she puts the metal ring down on the rest position, the bulb and buzzer cannot work.

Which materials might Sita have used to **insulate** the wire for the rest position?

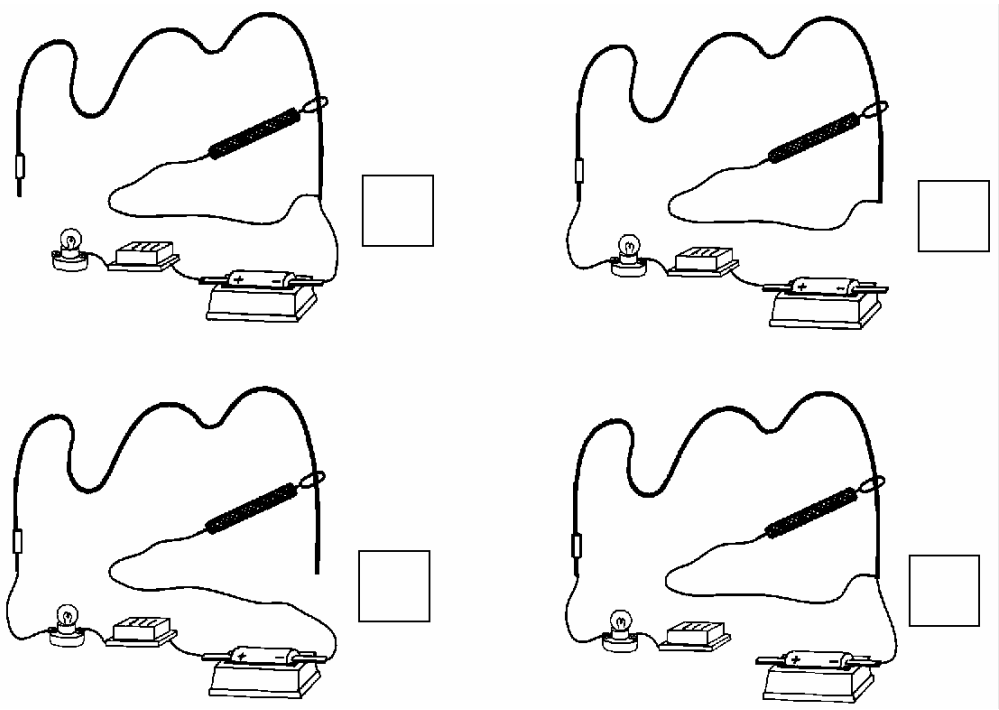
Tick the three correct boxes.

clear sticky tape	☐	copper wire	☐
plasticine	☐	newspaper	☐
steel wool	☐	aluminium foil	☐

2 marks

(c) The bulb and buzzer will only work in Sita's game when the metal ring touches the wire.

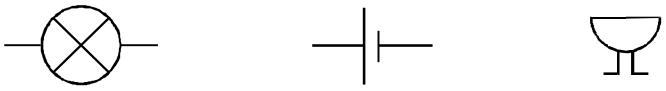
Tick **ONE** box to show which is the correct circuit for her game.



1 mark

(d) To make the electrical circuit for the game, Sita uses a buzzer, a bulb and a cell (battery).

Label the symbols below by writing **buzzer**, **bulb** or **cell**.



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1 mark

(e) Kalinda plays the game. She thinks the buzzer should be louder.

How can Sita change her circuit so that the **same** buzzer makes a louder sound?

.....

1 mark