



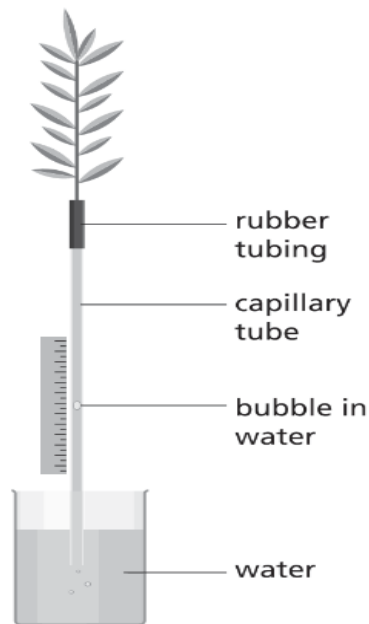
Student's Name: \_\_\_\_\_ Roll No. \_\_\_\_\_ Grade: 8

Marks: 80

Time Duration: 150 minutes

Invigilator's Sign.

**1. Lana investigates the how air temperature affects the rate of transpiration in a plant. She sets up the equipment shown below. Lana measures how far the bubble moves up the capillary tube in different air temperatures. (3)**



a. Write the testable hypothesis that Lana is investigating.

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b. List one control variable for Lana's investigation.

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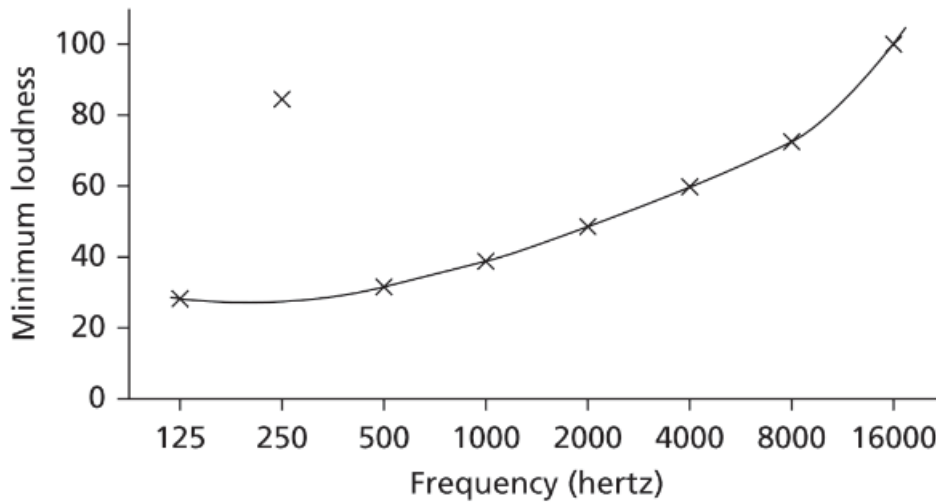
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c. Lana only had time to take one measurement at each temperature. Suggest what Lana could do to check her measurements were reliable.

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2. The graph shows the results of a hearing test for Ahmed. The vertical axis shows the minimum loudness Ahmed can hear for a particular frequency of sound. If the sound is quieter than this value, Ahmed cannot hear it. (3)



a. Describe any pattern you can see in the results. Write your answer in the style of a conclusion.

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b. Which result does not fit this pattern?

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c. Ahmed is 68 years old. Suggest how the graph would change for a healthy 18-year-old person.

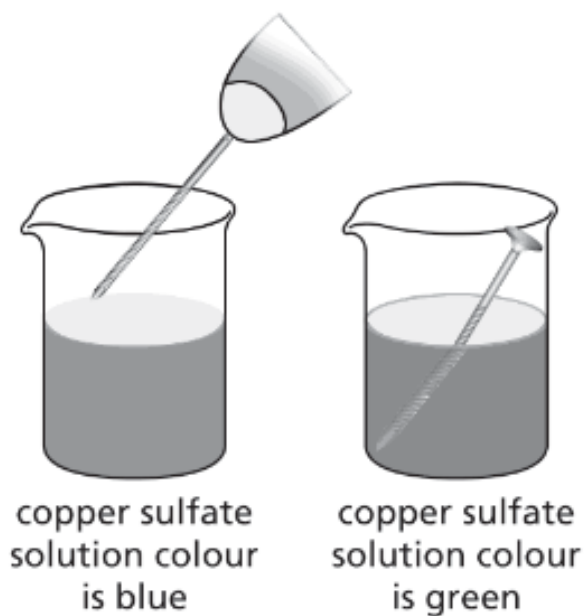
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3. Which of the following statements best describes excretion? Tick one answer only. (1)

- a. The removal of solid waste from an organism.
- b. Getting rid of waste substances from an organism.
- c. The removal of water from an organism.
- d. Breathing out carbon dioxide.

4. The first diagram shows an iron nail being put into some copper sulfate solution. The second diagram shows what it looks like after 20 minutes. (2)



a. Look at the diagrams and write down your observations.

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b. A displacement reaction has taken place. Complete the word equation.

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5. Carlos has a celery stalk with leaves. He cuts the bottom off the stalk. Then he puts the stalk in a glass of water mixed with blue food colouring. Next morning, the celery leaves are blue. Carlos cuts the stalk halfway up and sees small blue circles within the stalk.

a. Explain his observations. (1)

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b. What are the blue circles inside the stalk? (1)

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b. Transport water and minerals up the stem to the leaves.

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c. If plants do not get enough nitrates they don't grow properly. Explain why.

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d. Hussain removes the roots from a plant. Explain why the plant could die after the roots are removed.

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**7. Scientists can find out how well a person's kidneys are working by testing a urine sample for the presence of protein. A scientist is testing some urine samples from patients. The scientist tests each urine sample for protein using Biuret solution. A label on the Biuret solution shows health hazard symbol. (2)**

a. State one way the scientist could control the risks when using Biuret solution.

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The table shows the scientist's results

Urine sample	Colour change with Biuret solution
A	No change
B	Turned Purple
C	Turned Purple
D	No change

b. Which two samples contained protein?

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**8. Which statement best describes DNA? Tick one box only. (1)**

A molecule that carries genetic information.

An acid released by the brain.

A substance that controls growth.

A molecule that carries oxygen.

**9. Pierre and Rajiv are investigating the reactivity of different metals using displacement reactions. This is their method (3)**

- Measure out 10 cm<sup>3</sup> of four different metal sulfate solutions into test tubes.
- Add pieces of different metals to the test tubes.
- Carefully observe what happens.
- Record the results.

	Magnesium sulfate	Zinc sulfate	Iron Sulfate	Copper sulfate
Zinc	No reaction		Reaction	Reaction
Magnesium		Reaction	Reaction	Reaction
Unknown	No reaction	Reaction	Reaction	Reaction
Iron	No reaction	No reaction		Reaction
Copper	No reaction	No reaction	No reaction	

a. Suggest why the boys left some parts of the table blank.

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b. Put the metals in order of reactivity, starting with the most reactive.

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c. Use your knowledge of the reactivity series to name the unknown metal. Give a reason for your answer.

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**10. Gabriella forgets to water her houseplant for three weeks. The leaves become floppy. Explain why. (1)**

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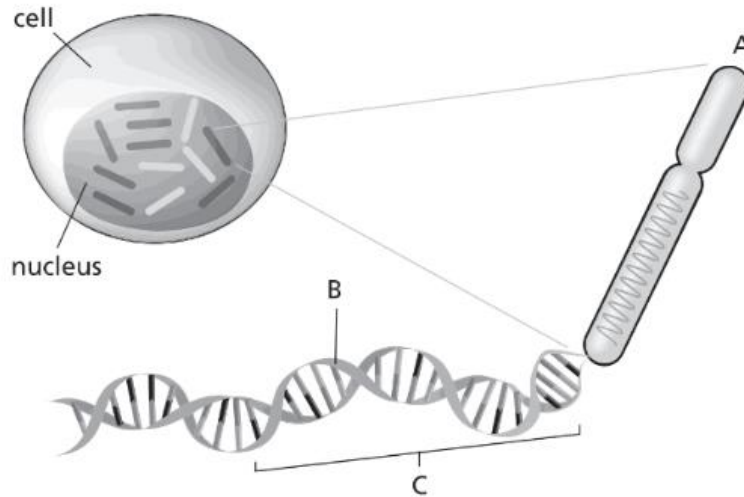
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11. The diagram shows the genetic material found inside the nucleus of a cell.

(3)



a. Which letter shows a chromosome?

\_\_\_\_\_

b. Which letter shows DNA?

\_\_\_\_\_

c. C shows a section of genetic material that controls the development of a specific characteristic. What is the name of C?

\_\_\_\_\_

12. Some trees have small needles instead of leaves. The needles have fewer stomata and a thick waxy cuticle. Explain one way this helps the tree survive.

(1)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. The excretion of urine involves several steps. Complete the table using numbers 1-4 to put the steps in the correct order.

(2)

- The kidney filters urea and water from the blood to form urine.
- Urine travels to the outside of the body in the urethra.
- Urine travels in the ureter.
- Urine is stored in the bladder.

**14. Anand writes an analogy for the function of the kidneys: 'The kidneys are like a swimming pool filter that removes dirt and debris from the water. Suggest one strength and one limitation of Anand's analogy. (2)**

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**15. In the 1940s, scientists knew that DNA was a very important molecule. However, they did not know about its structure. In the 1950s, two scientists, Franklin and Wilkins, studied DNA using X-rays. Franklin and Wilkins were experts in a technique called X-ray diffraction. Franklin produced an X-ray photograph that gave important clues about the structure of DNA. This allowed two other scientists, Watson and Crick, to produce a 3D model of DNA. (4)**

a. What question were all the scientists trying to answer?

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b. Give one piece of evidence that Watson and Crick used to produce their model.

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c. Explain how the work of Watson and Crick was made possible by other scientists.

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d. Watson and Crick produced a 3D model of DNA. Explain why scientists often use models to represent their ideas in science.

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**16. The table shows the length of a fetus at different times during a pregnancy.**

<b>Time in pregnancy (weeks)</b>	9	12	16	20	24	28	32	34	40
<b>Length of fetus (mm)</b>	60	100	140	190	230	270	300	340	380

a. Draw a line graph to show how the length of the fetus changes during the pregnancy.  
(Show your working on Graph paper) **(5)**

b. When is the fastest period of growth of the fetus? Explain your answer. **(1)**

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c. When is the slowest period of growth of the fetus? Explain your answer. **(1)**

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d. Explain why a doctor might be concerned if a pregnant woman gets a virus. **(1)**

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**17. Opi and Ken are expecting a baby. Sperm cells and egg cells are needed for sexual reproduction. **(3)****

a. What is the general name for a sex cell?

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b. Opi reads a leaflet that says that pregnant women should eat a healthy diet. Explain why.

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c. Opi and Ken have a baby girl. Which one of the following are the sex chromosomes found in a female? Circle the correct answer.

XX                  XY                  XZ                  XF

**18. Oliver and Gabriella want to make some magnesium sulfate. They have been given the following method. (7)**

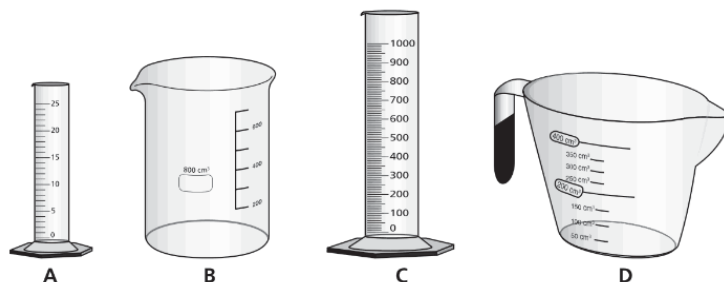
- Add excess metal to 25 cm<sup>3</sup> of dilute acid until no more dissolves.
- Filter off the excess metal.
- Evaporate until some solid appears.
- Leave to cool.
- Filter.

a. Name the starting materials they should use

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The diagram shows four pieces of apparatus that can be used to measure volumes of liquids.



b. Name the piece of apparatus Oliver and Gabriella should use to measure out the acid. Give a reason for your choice.

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c. What does 'excess metal' mean?

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d. Gabriella wants to see the crystals. She wants to continue heating when the solid starts to appear, but Oliver disagrees. He says to get good crystals you must leave the solution to cool. Why is Oliver correct?

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e. Oliver is about to pour the mixture into the filter funnel when Gabriella stops him because he has forgotten the filter paper.

i. Where should the filter paper be?

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ii. Explain why the mixture needs to be filtered.

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f. Write a word equation for the reaction.

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**19. Before starting the practical work the girls do a risk assessment. Dilute sodium carbonate solution and dilute hydrochloric acid are both classified as low hazard! Blessy and Mia are not sure how to carry out the experiment so they do a trial experiment. Mia measures out 25 cm<sup>3</sup> of hydrochloric acid and pours it into a beaker. Blessy then adds 25 cm<sup>3</sup> of sodium carbonate solution and observes the reaction. They evaporate the mixture until some solid appears before leaving it to cool.** (2)

a. What does Blessy observe?

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b. How do they know when the reaction is over?

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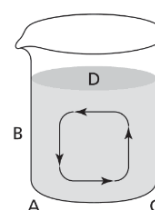
**20. Look at the diagram of coloured liquid in a beaker. At which point should a source of heat be placed to produce the movement of liquid shown by the arrows? Tick the correct answer.** (1)

A

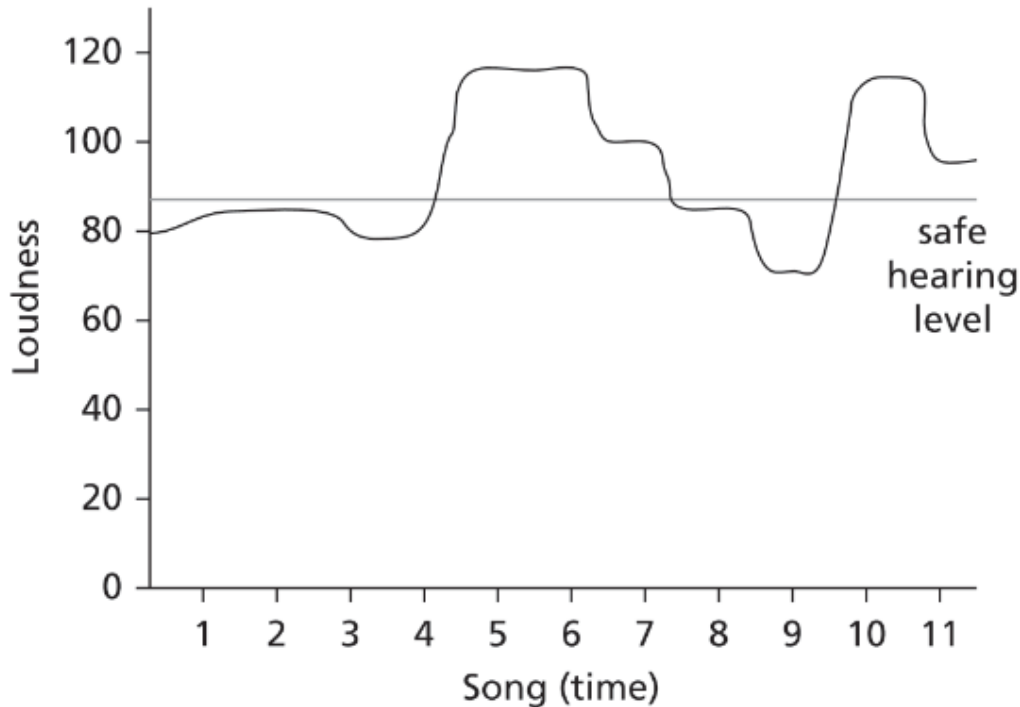
C

D

B



21. Aiko is a sound technician for a rock band. The band like to turn up the sound very high and play lots of electric guitar music. Aiko measured the loudness of one of the concerts. The concert lasted two hours and the loudness changed depending on the song that was being played. Look at the graph of loudness against time. (3)



a. The horizontal line shows the maximum loudness that is completely safe for humans. Was this concert completely safe for everyone who went to it? Explain your answer.

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b. Suggest two things that Aiko could do to protect her hearing.

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c. Explain to Aiko why protecting her hearing is important.

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22. The picture shows a waterfall in a rift valley in Iceland.

(2)



Suggest two types of evidence that could be found in Iceland to support the theory of plate tectonics.

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23. Doctor Strange was visited by a family. Some of them were having problems hearing some sounds. The doctor decided to test each family member's hearing by measuring the highest frequency sound they could hear. The loudness of each sound was kept the same. The results are shown in this table. (2)

Name	Age	Highest frequency that can be heard (Hz)
Gabriella	74	9000
Carlos	50	16 500
Safia	44	18000
Lily	24	8000
Ahmed	17	20 000

a. Describe any pattern you can see in the results.

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b. Which result does not fit this pattern?

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**24. Sort the following sentences into order to describe how fossils can support the theory of tectonic plates. Write the numbers 1 to 5 in the boxes. (2)**

- a. The animals die and their remains are buried under layers of rock.
- b. People discover fossils of the same animals on two continents that are separated by thousands of kilometers of ocean.
- c. Animals that live on land evolve on the supercontinent.
- d. The supercontinent breaks apart and the continents drift apart from each other.
- e. The weight of the rock layers causes the remains to form fossils.

**25. Scientists have discovered that tidal forces due to the orbit of the Moon also have an effect on the movement of tectonic plates. Use the effects of forces that produce ocean tides on Earth as a model to suggest (2)**

a. How these forces can also affect the Earth's mantle.

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b. We see effects every day from ocean tides. Suggest one limitation with using the ocean tide model to describe how tidal forces affect tectonic plates.

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**26. Answer the following questions.**

a. A man and woman have two daughters. Although the daughters are sisters, they do not look identical. Explain why. (1)

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b. Name one of the drugs in tobacco smoke that reduces the amount of oxygen the fetus gets. (1)

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c. Describe two harmful effects that a pregnant woman can cause to the fetus if she smokes during pregnancy. (2)

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27. Why can't you get good destructive interference if the two original waves are not identical? (1)

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28. The table below gives descriptions of features of a hydrangea plant. Tick the correct column to show whether each feature is an example of inherited (genetic) or environmental variation. (3)

Description of feature	Example of inherited variation	Example of environmental variation
Flat, pointed leaves		
Leaves that have turned yellow due to lack of magnesium in soil		
Blue flowers due to acidic soil		

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