



GOVERNMENT OF SAMOA

STUDENT EDUCATION NUMBER									

Samoa National Junior School Certificate

GENERAL SCIENCE

2023

QUESTION and ANSWER BOOKLET

Time allowed: 3 Hours & 10 minutes

INSTRUCTIONS

1. You have 10 minutes to read **before** you start the exam.
2. Write your **Student Education Number (SEN)** in the space provided on the top right-hand corner of this page.
3. **Answer ALL QUESTIONS.** Write your answers in the spaces provided in this booklet.
4. If you need more space, ask the Supervisor for extra paper. Write your SEN on all extra sheets used and clearly number the questions. Attach the extra sheets to the appropriate places in this booklet.

SECTIONS		Pages	Time (min)	Weighting
SECTION A	BIOLOGY	2-7	60	34
SECTION B	CHEMISTRY	8-13	60	32
SECTION C	PHYSICS	14-20	60	34
TOTAL			180	100

Check that this booklet contains pages 2-21 in the correct order and that none of these pages are blank.

HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Strand 1: Variety of Life

(6 marks)

For Question 1, clearly circle the LETTER or the correct answer.

1. Which of the following **BEST** defines a pathogen?

- A. A substance that causes an allergic reaction.
- B. A microorganism that causes disease.
- C. A type of cell in the human immune system.
- D. A molecule that helps to fight infections.

SL 1

2. Describe **ONE** symptom of influenza that can affect humans. Include in your answer the name of the microorganism responsible for influenza.

SL 2

3. Explain how the flu vaccination helps prevent influenza.

SL 3

For Question 4, clearly circle the LETTER or the correct answer.

4. Which of the following terms **BEST** describes an individual who has two different alleles for a particular gene?

- A. Homozygous
- B. Heterozygous
- C. Hybrid
- D. mutant

SL 1

5. A plant with yellow seeds (YY) is crossed with a plant with green seeds (yy). Using a Punnett square, determine the probability of the F1 generation producing offspring with yellow seeds and green seeds.

SL 4

6. Describe how sex is determined in humans.

SL 2

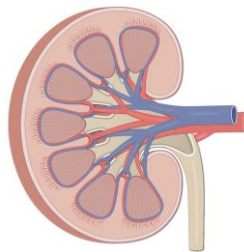
For Questions 7 and 10, clearly circle the **LETTER** of the correct answer.

7. Which of the following **BEST** defines a pathogen?

- A. Bones and cartilage.
- B. Muscles and tendons.
- C. Ligaments and joints.
- D. All of the above.

SL 1

8. Explain the location and function of the organ shown below.



SL 3

9. Describe any **TWO** of the characteristics of life represented by the acronym MRS C GREN.

SL 2

10. Which of the following **BEST** describes fertilization?
- A. The process of the sperm and egg joining together to form a zygote.
 - B. The process of the zygote dividing into two or more cells.
 - C. The process of the zygote implanting in the uterus lining.
 - D. The process of the embryo developing into a fetus.

	SL 1

Strand 4: Plant Biology

(7 marks)

For Question 11, clearly circle the LETTER of the correct answer.

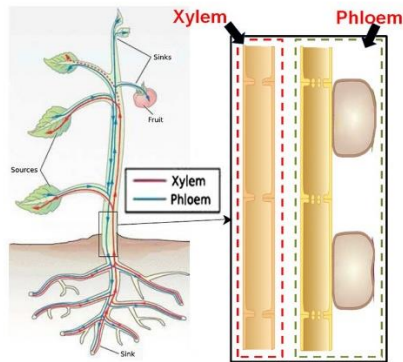
11. Which of the following is a raw material for photosynthesis?
- A. Carbon monoxide.
 - B. Nitrogen gas.
 - C. Water.
 - D. Methane.

	SL 1

12. Explain how sunlight affects the transpiration rate in plants.

SL 3

13. Explain how translocation occurs in plants. Use the diagram below to help you with your answer.



SL 3

Strand 5: Environment **(7 marks)**

14. Define ecosystem.

SL 1

15. Deforestation is one of the major environmental issues faced not only here in Samoa, but also globally.

(a) Describe **TWO** contributing factors to deforestation.

SL 2

(b) Explain **THREE** effects deforestation has not only on the environment but also animals and people.

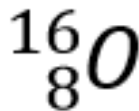
SL 3

Strand 1: The ways materials are structured.

For Questions 16 – 18, clearly circle the LETTER of the correct answer.

16. The element of the Periodic Table shown has a mass number of 16. What is its number of neutrons?

- A. 0
- B. 24
- C. 16
- D. 8



SL 1

17. A substance made up of one type of atom is a/an:

- A. compound.
- B. element.
- C. mixture.
- D. solid.

SL 1

18. Which of the following is the name of the element with the symbol **N**?

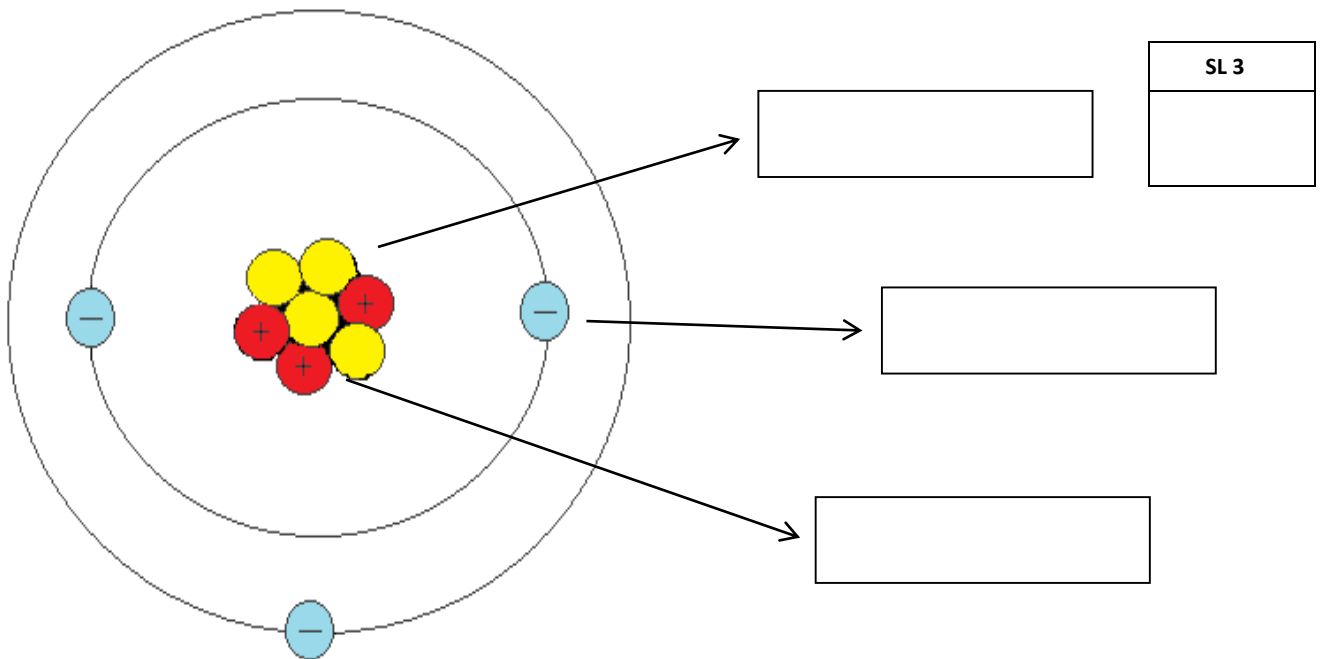
- A. Nitrogen
- B. Neon
- C. Sodium
- D. Nickel

SL 1

19. The elements in Group 1 of the Periodic Table are called **alkali metals**. State **ONE** common physical property of this group and name **ONE** metal in it.

SL 2

20. The following diagram is the atomic structure of Lithium. Label the diagram to show **protons**, **neutrons** and **electrons**.



21. Explain the formation of Lithium ion Li^+ . (Hint: Atomic Number = 31)

SL 3

Strand 2: The properties and uses of groups of substances.

22. A compound sodium fluoride is commonly added to toothpaste. Give the chemical formula for sodium fluoride and state its purpose or use as an ingredient in toothpaste.

Chemical:



Formula: _____

Purpose/Use: _____

SL 2

23. Sodium fluoride is also added in bottled drinking water in small amounts of grams per litre. State **TWO** properties of sodium fluoride which make it ideal to be added to drinking water.



SL 2

24. Explain why excess or high amounts of sodium fluoride in drinking water is harmful.

SL 3

Strand 3: The ways materials changed.

26. When ice melts, it is a chemical change. **TRUE** or **FALSE**?

SL 1

27. The following are examples of chemical changes, **EXCEPT** one. Circle the example that is **NOT** a chemical change.

Burning wood

Rotting apple

Rusting metal

Photosynthesis

Digestion

Baking cake

Shredding papers

Cooking an egg

SL 1

28. The combustion of fuel in gas stoves for cooking of food is a chemical reaction. State what the **TWO** reactants are and what the reaction releases as a result.

Two reactants: _____

Releases: _____

SL 2

29. The list below are factors that affect the rate of a chemical reaction:

Temperature, concentration of reactants, physical state of reactants, catalyst, reactivity of reactants

Match the correct factor to the explanation of how they affect the rate of a chemical reaction below:

(a) The more concentrated the faster the rate. _____

(b) The greater the surface area the greater the rate. _____

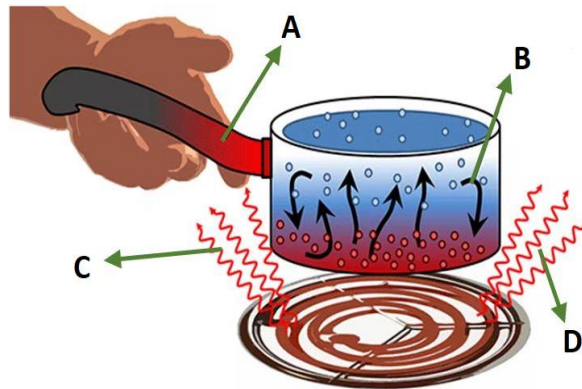
(c) The lower the temperature the slower the rate. _____

SL 3

Strand 1: Energy (Waves)

(9 marks)

For Questions 31 and 32, clearly circle the LETTER of the correct answer.

31. Which letter in the diagram below best defines the *Radiation* process?

- A. A
 B. B
 C. C
 D. D

SL 1

32. Which of the following materials is an example of an insulator of heat?

A.



B.



C.

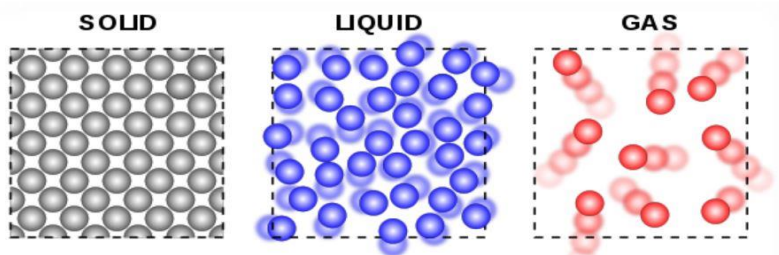


D.



SL 1

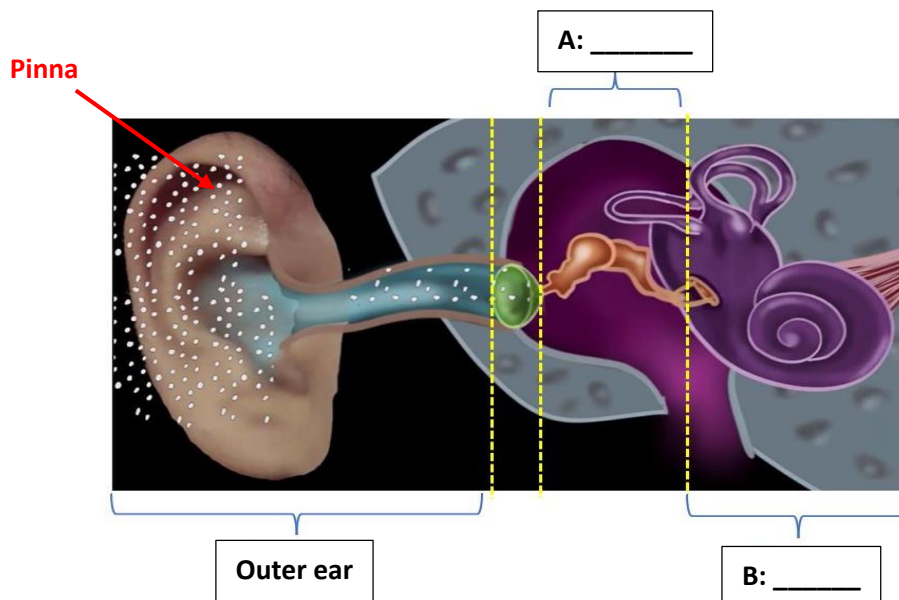
33. Observe the different behaviour of particles in three different stages as shown in Figure below.



State **TWO** different behaviour of particles in solids

SL 2

34. The human ear can be divided into 3 different parts. Name the missing parts labelled A and B from Figure below.



A: _____

B: _____

SL 2

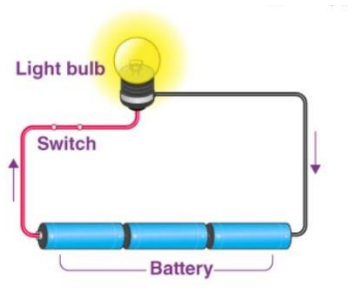
35. Describe the main function of Pinna in receiving sounds for a human ear.

SL 3

Strand 2: Electricity

(8 marks)

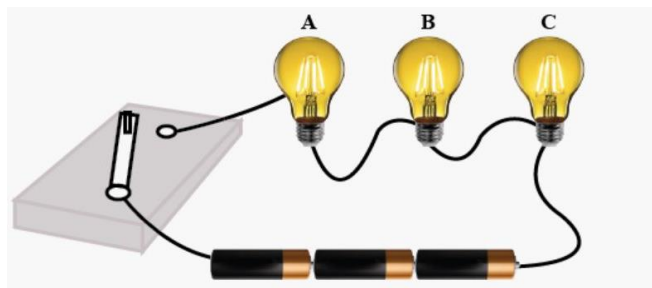
36. Below is an example of a simple circuit. Answer **TRUE** or **FALSE**.



Answer: _____

SL 1

37. Describe what will happen to the series circuit below, if bulb A is removed.



SL 3

Strand 3: Magnetism

(8 marks)

39. Draw the magnetic field lines around the bar magnet below.



SL 2

40. Explain why like-poles repel and unlike poles attract.

SL 3

41. List **THREE** factors that electricity or electric fields from magnetism depend on.

- (a) _____
- (b) _____
- (c) _____

SL 3

Strand 4: Forces and Motion

(9 marks)

42. Answer TRUE or FALSE.

Newton's First law of motion states that if an object is at rest, it will stay at rest unless NET force acts on it. If an object is in motion, it will stay in motion unless a NET force acts on it.'

Answer: _____

SL 1

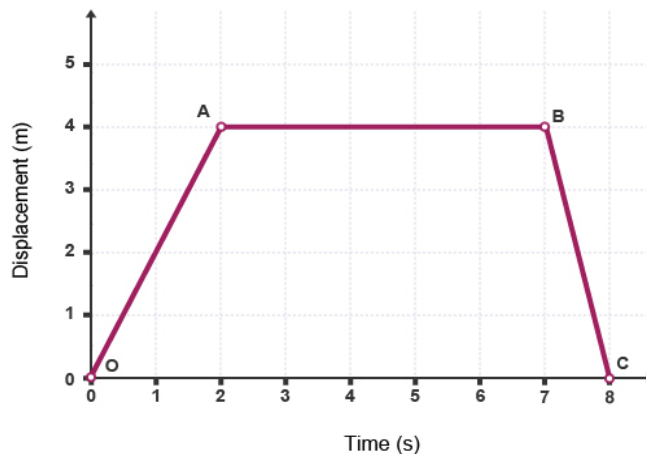
43. The picture below illustrates a linear motion.



Answer: _____

SL 1

44. The graph shown below is a Distance-time graph showing 3 different motions of a sports car in three different periods of time.

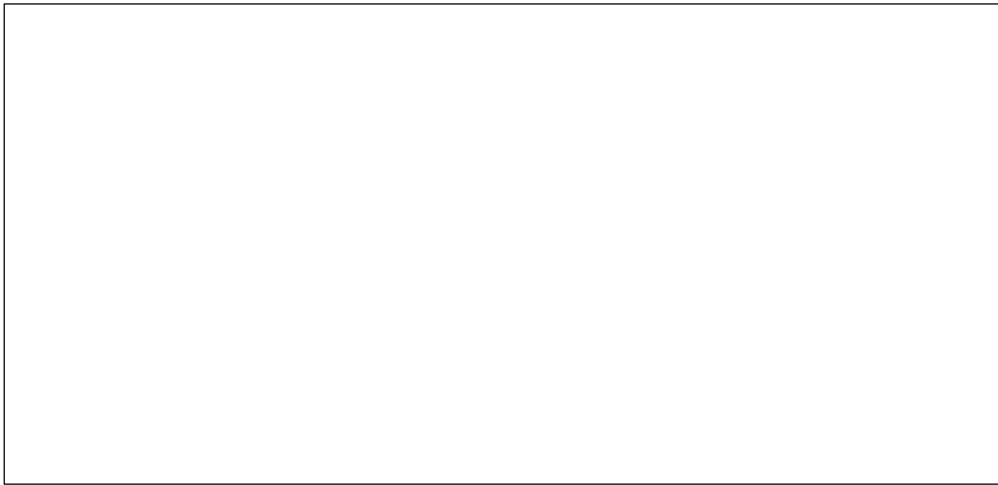


State the motion of the sports car from;

- (i) 0s to 2s period of time: _____
- (ii) 2s to 7s period of time: _____
- (ii) 7s to 8s period of time: _____

SL 3

45. Calculate the speed of the sports car it traveled in the first 2 seconds.



SL 3

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(For Scorers only)

SECTIONS		Weighting	Scores	Check Scorer	AED Check
SECTION A	BIOLOGY	34			
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SECTION C	PHYSICS	34			
TOTAL		100			