MARKER CODE			

Student Personal Identification Number(SPIN)			

TONGA GOVERNMENT

MINISTRY OF EDUCATION AND TRAINING

FORM 2 COMMON EXAMINATIONS

2015

SCIENCE

QUESTION AND ANSWER BOOKLET

Time Allowed: **2 Hours**

INSTRUCTIONS

1. This paper has **FIVE Sections.** ALL Sections are COMPULSORY.

SECTION A:	**Science Skills**	**15 MARKS**
SECTION B:	**Living World**	**25 MARKS**
SECTION C:	**Physical World**	**25 MARKS**
SECTION D:	**Material World**	**20 MARKS**
SECTION E:	**Planet Earth and Beyond**	**15 MARKS**

2. Write your **Student Personal Identification Number (SPIN)** on the top right hand corner of this page and on page 19.
3. Answer **ALL** questions in the spaces provided.
4. Use a black or blue pen for written answers and a pencil for drawings.
5. Write legibly and work neatly.
6. Check that this booklet contains **19** pages.

YOU MUST HAND IN THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL MARKS 100

SECTION A: SCIENCE SKILLS (15 MARKS)

PART ONE: MULTIPLE CHOICE (5 Marks)

Circle the letter of the best answer.

1. The following sign means _____ material.

A. flammable
B. poisonous
C. explosive
D. radioactive

2. Which source of heat used in the laboratory and its flame can be adjusted?
A. conical flask
B. bunsen burner
C. burning candle
D. spirit burner

3. A table of data collected in an experiment is a part of the _____.
A. hypothesis
B. procedure
C. results
D. conclusion

4. A banana tree is planted and its height is recorded every month. What are the independent and dependent variables from the data recorded?

	Independent variable	Dependent variable
A.	Month	Height
B.	Height	Month
C.	Month	Banana
D.	Height	Banana

5. Which of the following instruments will give the most accurate measure of a given volume of water?
A. beaker
B. measuring cylinder
C. conical flask
D. test-tube

PART TWO: MATCHING (5 Marks)

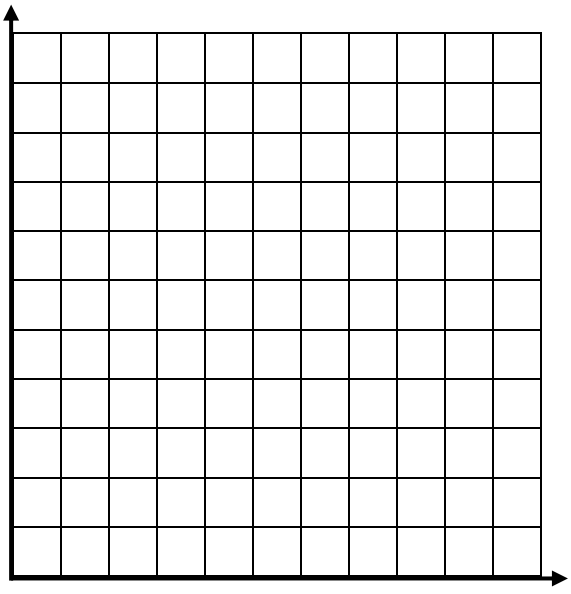
1. Match **Column B** to **Column A** by writing the correct letter on the line before each number.

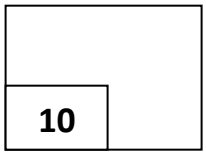
	Column A	**Column B**
_____	(1) Materials	(A) It is an explanation mainly to verify the aim.
_____	(2) Method	(B) An intelligent prediction.
_____	(3) Conclusion	(C) It includes observations, graphs and diagrams.
_____	(4) Title	(D) A step-by-step way of doing the experiment.
_____	(5) Results	(E) Equipment required for the experiment.
		(F) A statement describing the problem to be investigated.

PART THREE: DRAWING GRAPH (5 Marks)

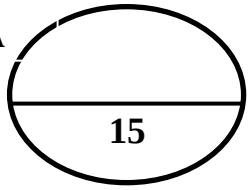
1. Use the data in the table below to draw a graph on the grid provided. Number and label both axes appropriately with units and a correct title included.

Amount of fertilizer (mg)	**Height of plant seedlings (cm)**
0	10
15	25
25	30
35	30
50	30





SECTION A



SECTION B **LIVING WORLD** **(25 MARKS)**

PART ONE **MULTIPLE CHOICE** **(5 Marks)**

Circle the letter of the best answer.

1. Which of the following is NOT a part of an animal cell?
   A. Cell membrane
   B. Cell wall
   C. Nucleus
   D. Cytoplasm

2. Photosynthesis takes place in the _____ of a plant cell.
   A. nucleus
   B. cell membrane
   C. chloroplast
   D. cell wall

3. Most food is digested and absorbed in the _____.
   A. small intestine
   B. large intestine
   C. stomach
   D. mouth

4. What are the names of the single-celled organisms **(I)**, **(II)** and **(III)**?

(I) **(II)** **(III)**

A.	paramecium	amoeba	euglena
B.	paramecium	euglena	amoeba
C.	amoeba	paramecium	euglena
D.	amoeba	euglena	paramecium

5. Which of the following is a function of water in our bodies?
   A. It transports nutrients and waste throughout the body.
   B. It is the medium for transporting oxygen.
   C. It helps to change our constant body temperature.
   D. It allows the volume of our cells to vary.

PART TWO **SHORT ANSWERS** **(20 Marks)**

1. The picture shows three different birds.

Use the following key to identify birds **X** and **Y.**

(I)	straight beak	Oystercatcher
	curved beak	go to **(II)**

(II)	beak curved upwards	Arocet
	beak curved downwards	Whimbrel

i. Bird **X** is _____

ii. Bird **Y** is _____ (2 marks)

2. Some features of birds are listed below.

- Birds have feathers.
- Birds lay eggs.
- Birds have backbones.

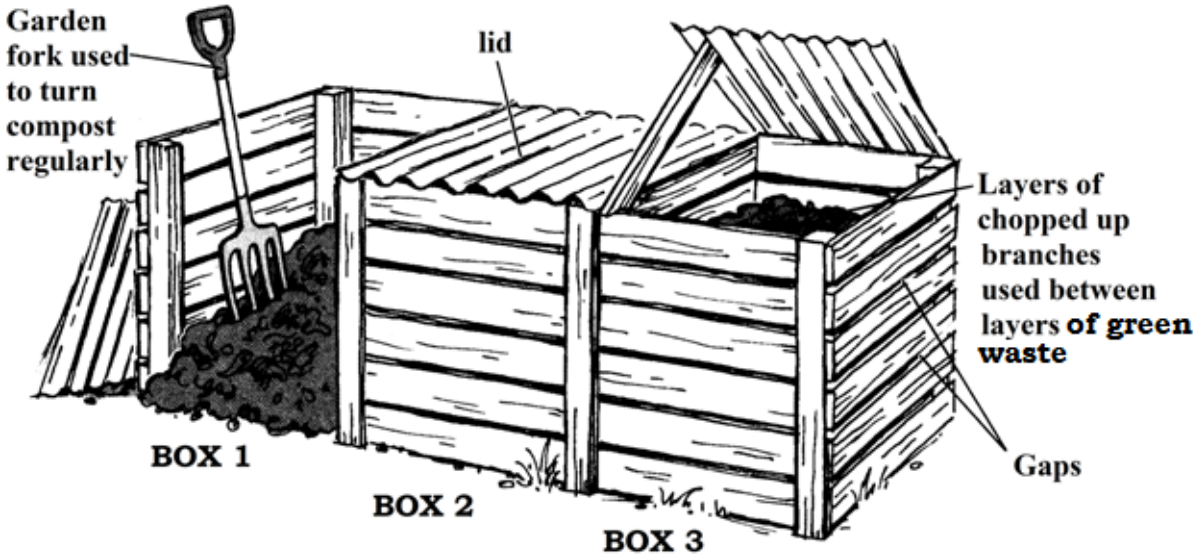
i. Which feature is unique to the birds only?

_____ (1 mark)

ii. Which feature of a bird that is common with all other vertebrates?

_____ (1 mark)

3. The diagram below shows three composting boxes.



a. Use the diagram above and what you have studied to answer the following questions.

(i) Why do boxes have gaps on the sides?

_____ (1 mark)

(ii) The compost is required to turn regularly. Why?

_____ (1 mark)

(iii) Water is often added to the compost. Why?

_____ (1 mark)

(iv) Why compost boxes are placed in warm areas?

_____ (1 mark)

b. **True** or **False**. Write **True** if you think the statement is true or otherwise write **False** on the lines provided. (3 marks)

(i) The boxes have lids mainly to keep away the insects. _____

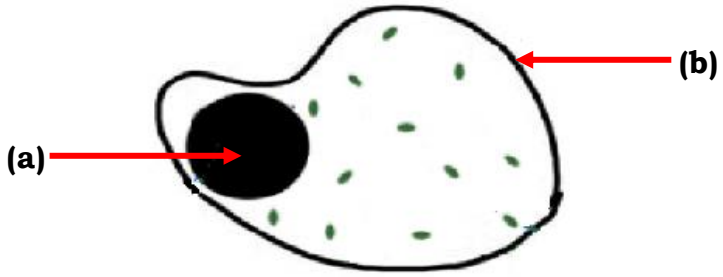
(ii) Layers of chopped up branches are used in composting to reduce the amount of air in the boxes. _____

(iii) The temperature of the compost boxes is higher than the surrounding air because of decomposers. _____

4. Match **Column B** to **Column A** by writing the correct letter on the line in front of each number.

Column A		**Column B**
_____ (1). Iodine	(A).	Are finger-like projections in the small intestine.
_____ (2). Exhalation	(B).	Stage of liver damage causing hepatitis.
_____ (3). Peristalsis	(C).	The removal of waste products produced by cell metabolism.
_____ (4). Villi	(D).	Diaphragm relaxes, ribs move in making chest cavity smaller.
_____ (5). Excretion	(E).	Mineral needed for normal thyroid hormone production.
	(F).	Powerful milking action of muscles in the esophagus. (5 marks)

4. The following is a diagram of a human cheek cell. Label the parts **(a)** and **(b)** and state their functions.



(a): _____ Function: _____

_____ (2 marks)

(b): _____ Function: _____

_____ (2 marks)

SECTION C **PHYSICAL WORLD** **(25 MARKS)**

PART ONE **MULTIPLE CHOICE** **(5 Marks)**

Circle the letter of the best answer.

1. What form of energy is represented by the picture below?

A. Light and heat

B. Atomic and chemical

C. Sound and movement

D. Heat and nuclear

2. Which of these shows the correct energy change?

A. Bell: sound → movement

B. Radio: electrical → sound

C. Friction: heat →stored chemical

D. Car: movement → electricity

3. Which of the following is one way of conserving energy in Tonga?

A. Turn off electric devices when not in use
B. Let tap water runs when brushing teeth
C. Do not fix leakages in fuel tanks.
D. Import more fossil fuels (petrol, diesel).

4. What cause objects to fall towards the earth?

A. Kinetic Energy

B. Potential Energy

C. Chemical Energy

D. Gravitational Energy

5. If a box was pushed with 20N to the right and another 15N acted on it from the opposite side. What will happen to the box?

A. Move towards the right.

B. Move towards the left.

C. Move at 45^{o} to the right.

D. Move at 45^{o} to the left.

PART TWO **SHORT ANSWERS** **(20 Marks)**

1. List TWO ways in which energy can be stored. (2 marks)

   i. _____

   ii. _____

2. The following picture is a girl who competed in one of the past inter-colleges sports competition.

   a. What is the energy conversion involved when the girl was running?

   _____

   _____ (2 marks)

   b. Why the girl felt a lot warmer after running?

   _____ (1 mark)

   c. i. Name a force that slowed down her running.

   _____ (1 mark)

   ii. How did that force slow down her running?

   _____ (1 mark)

   d. Why is it very important for athletes to train before they compete?

   _____ (1 mark)

3. a. Name another way to obtain electricity other than petrol.

_____ (1 mark)

b. Give two reasons why it is good to use the way you have named in part a?

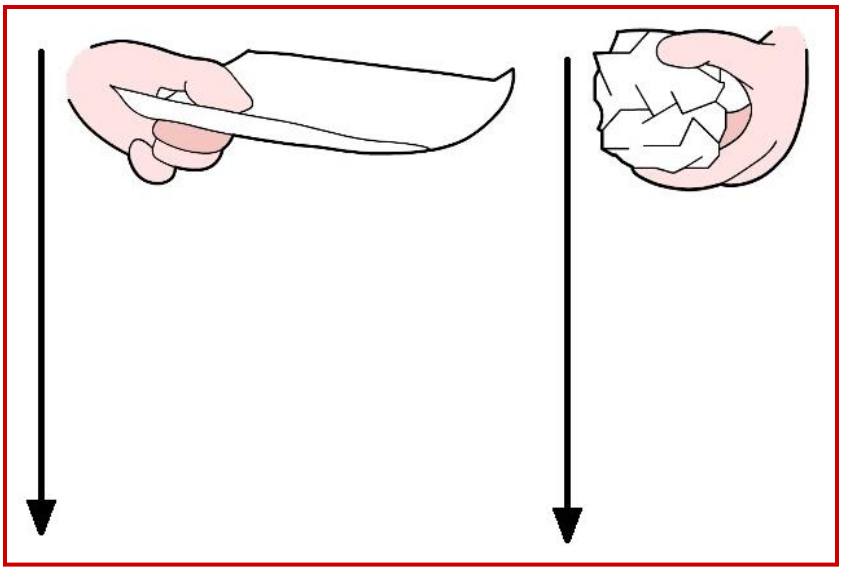
i. _____ (1 mark)

ii. _____ (1 mark)

c. How can we reduce electricity consumption (use) in Tonga?

_____ (1 mark)

4. The picture shows two pieces of paper of the same size and weight. They were dropped from the same height, one flat and one crumpled into a ball.



a. Which piece of paper will reach the ground first?

_____ (1 mark)

b. Give a reason to your answer in part a.

_____

_____ (1 mark)

4. Gravity

a. Is the gravity of the moon less than or more than that of the earth?

_____ (1 mark)

b. Give a reason to your answer in part a.

_____

_____ (1 mark)

5. Forces involved in pedalling a bicycle.

Sprocket of a bicycle

a. What kind of force is used by the leg to cause the sprocket to turn?

_____ (1 mark)

b. What kind of force acts on the chain?

_____ (1 mark)

c. What force does the wheel exert on the road?

_____ (1 mark)

d. Name one other force that the bicycle must try to overcome when moving on the road?

_____ (1 mark)

SECTION D: MATERIAL WORLD (20 MARKS)

PART ONE MULTIPLE CHOICE (5 Marks)

Circle the letter of the best answer.

1. Which of the following will change if you go to the moon?
   A. Mass
   B. Weight
   C. Height
   D. Skin

2. Which of the following methods is the best for measuring volume of an irregular object?
   A. Displacement of water.
   B. Evaporation of water.
   C. Distillation process.
   D. Decantation process.

3. All materials with density _____ will float in water.
   A. less than 10 g/ml
   B. greater than 10 g/ml
   C. less than 1.0 g/ml
   D. greater than 1.0 g/ml

4. What happened to the density of water when we add salt to it?
   A. Decrease.
   B. Increase.
   C. Not affected.
   D. Negative.

5. What will happen to the gas particles in a syringe when it is pressed down?
   A. Become larger.
   B. Collide more often.
   C. Become smaller.
   D. Collide less often.

PART TWO **SHORT ANSWERS** **(15 Marks)**

1. Sione has two liquids **X** and **Y**. He wants to find out which one of the two liquids has greater density.

   a. Describe a method which can be used to get what Sione wants.

   _____

   _____ (2 marks)

   b. Sione had found out that liquid **Y** has a density greater than that of the sea water.

      i. What will happen if a boiled egg will be dropped into a container full of liquid **Y**?

      _____ (1 mark)

      ii. Give a reason to your answer in part i?

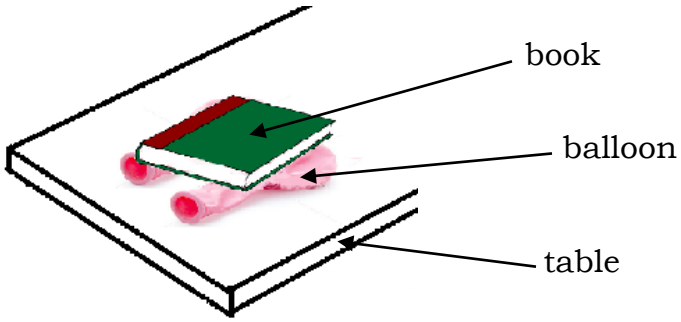
      _____ (1 mark)

      iii. Arrange the following liquids from the least density liquid to the most density liquid.

      Water, Liquid **Y**, Kerosene, Sea water.

      _____ (2 marks)

2. A Form 2 teacher asked one of her student to place a book on top of two balloons then pump air into them.



   i. Give one observation the student will make in this activity.

   _____ (1 mark)

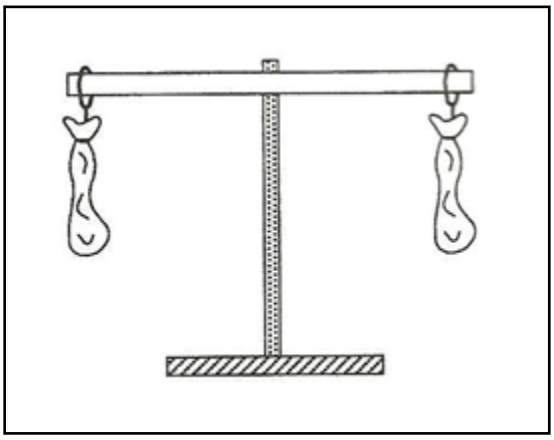
   ii. What property of air does this activity show you?

   _____

   _____ (1 mark)

8

3. Two equal sized balloons were tied to opposite ends of a balance as shown. One of the balloons was untied and got pumped with air. This balloon was tied back to the balance.



a. Draw in the box below how the balance and the balloon look like AFTER one balloon was blown.

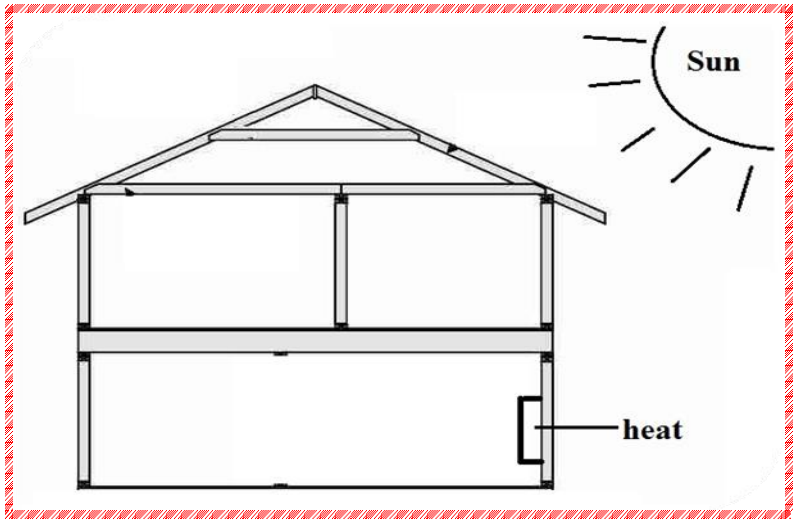
(2 marks)

b. What does the observation drawn above tells you about air?

_____ (1 mark)

4. Answer the following from the diagram below.

The diagram shows a cross-section of a house.



a. What is the name of the process by which heat energy is transferred through the walls of the house?

_____ (1 mark)

b. What is the name for materials that do not allow heat energy to pass through them easily?

_____ (1 mark)

c. What is the name of the process by which air moves and carries heat energy with it?

_____ (1 mark)

d. What is the name of the process by which energy reaches the walls of the house directly from the Sun?

_____ (1 mark)

SECTION E: PLANET EARTH AND BEYOND (15 MARKS)

PART ONE MULTIPLE CHOICE (5 Marks)

Circle the letter of the best answer.

1. When the Sun, Earth and Moon are in a straight line, with the Earth in the middle, the event is called _____.
   A. a full moon
   B. a new moon
   C. an eclipse of the sun
   D. an eclipse of the moon

2. You can see many distant stars if you use a _____.
   A. calendar
   B. microscope
   C. telescope
   D. hand lens

3. A full moon can be seen about once every _____.
   A. night
   B. month
   C. season
   D. year

4. Which of the following contribute to the formation of Tonga's soil?
   A. Rain
   B. People
   C. Action of living things
   D. Seasons of the year

5. The pull of gravity on Earth is a direct result of the
   A. magnetic field of the earth.
   B. mass of the earth.
   C. rotation of the earth on its axis.
   D. earth revolving around the sun.

PART TWO **SHORT ANSWERW** **(10 Marks)**

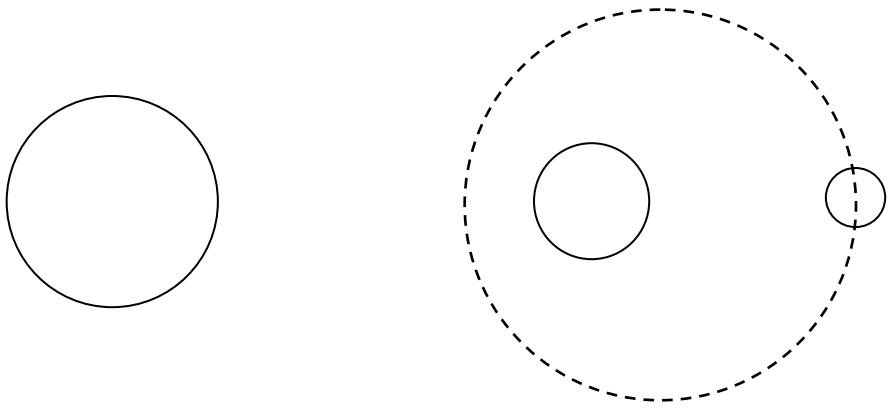
1. Match up the following events with the time period involved. Write the letter of the time in the space beside each event.

EVENT		**TIME PERIOD**
One tidal cycle	____	A. 23 hours 56 mins
One rotation of Earth	____	B. 12.5 hours
One orbit by Earth	____	C. 27 days 7 hours
One lunar cycle	____	D. 365.2 days
One rotation of the moon	____	

(5 marks)

2. a. Complete the diagram in the box below to show how a lunar eclipse occurs. Label the Sun, Earth and the Moon. Also include the umbra, penumbra and the light rays. (3 marks)

Diagram of a Lunar eclipse



b. At which phase of the Moon can a lunar eclipse occur?

_____ (1 mark)

c. From your diagram, what does the moon look like as it passes through the umbra?

_____ (1 mark)

Student Personal Identification Number(SPIN)			

SCIENCE

FORM 2 COMMON EXAMINATION

2015

SECTIONS	MARK	CHECK MARK	TOTAL
SECTION A			15
SECTION B			25
SECTION C			25
SECTION D			20
SECTION E			15
TOTAL			100