



# VANDA

## SCIENCE GLOBAL FINALS

### Primary 3 / Grade 3

Full Name: \_\_\_\_\_ Country: \_\_\_\_\_

School: \_\_\_\_\_ Index Number: \_\_\_\_\_

#### Instructions to Students:

1. Only scientific calculators are allowed during the contest for secondary school/Grade 7 and above students.
2. The duration of this contest is **1 hour**. You may not leave the contest venue within the first half an hour of the paper.
3. This examination paper contains **20** questions and comprises of **18** printed pages, inclusive of the cover page.
4. Each question has only 4 possible answers: **A, B, C** and **D**. You must shade your correct option on the Answer Entry Sheet provided.
5. The total marks for this paper is 70 points:

#### Section A:

Question 1 to 5: +2 points for correct answer, 0 points for no answer and –1 point for wrong answer.

#### Section B:

Question 6 to 10: +3 points for correct answer, 0 points for no answer or wrong answer.

#### Section C:

Question 11 to 20: +4 points for correct answer, 0 points for no answer or wrong answer.

6. You are not allowed to bring the question paper and answer script out of the contest venue.

#### Note:

- 1) You may assume that there is no air resistance throughout the contest, unless otherwise stated.
- 2) All temperatures are in degree Celsius, unless otherwise stated.
- 3) Room temperature is 25°C at 1 atmospheric pressure.
- 4) Gravitational Acceleration is taken to be 9.8 m/s<sup>2</sup>.

## Rough Working



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**Section A:** (Question 1 to 5: +2 points for correct answer, 0 points for no answer and –1 point for wrong answer.)

Q1) The following is a picture of birch trees.



Birch trees are leafless in autumn but have new leaves in spring. Their leaves are shown in the picture below:



<b>Coniferous</b>	<b>Deciduous</b>
Trees that bear cones, have needle-like or scale-like leaves. Seeds are found on the surface of the cones.	Trees which lose their leaves for part of the year. Leaves are flat, broad, able to trap a lot of sunlight and they require lots of water.

Under which family would you classify the birch tree?

- A) Coniferous
- B) Deciduous
- C) None of the above
- D) It can be classified under both groups.

Q2) Which of the following things consist of living things only?

- A) Water, air, rock, mud, grass
- B) Ant, spoon, sand, sugar, snail
- C) Earthworm, bacteria, mushroom, grasshopper, dolphin
- D) Bed, mattress, floor, cake, eraser

Q3) Why do we classify a dog and a mimosa plant as living things?

- 1) They need air, food and water to survive.
  - 2) They respond to changes.
  - 3) They make their own food to survive.
  - 4) They can move from place to place to avoid predators.
- A) Option 1 only
  - B) Option 2 only
  - C) Option 2 and 4
  - D) Option 1 and 2

Q4) Which of the following statements are true about maidenhair fern, liverwort, club moss and hornworts?

- 1) They do not reproduce.
  - 2) They are living things.
  - 3) They are non-flowering.
  - 4) They need moisture to survive.
- A) Option 1, 2 and 4
  - B) Option 1, 2 and 3
  - C) Option 2 and 3
  - D) Option 2, 3 and 4

- Q5) Sally placed 4 different plants in the dark overnight. The next day, she collected the stems from these 4 different types of plants. The 4 plants are the balsam plant, ginger plant, peanut plant and tapioca plant. She measured the circumferences of their stem (the distance around the edge of the stem) and recorded them in the following table.

	Stem S	Stem T	Stem U	Stem V
Circumference	0.6cm	0.5cm	8cm	0.7cm
Colour of Iodine	Brown	Brown	Blue Black	Brown

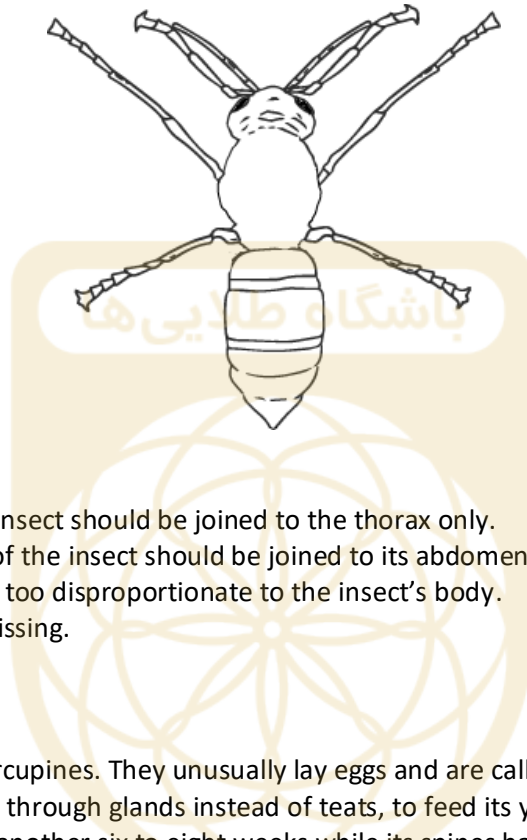
Which of the stems belong to the ginger plant?

- A) S
- B) T
- C) U
- D) V



**Section B:** (Question 6 to 10: +3 points for correct answer, 0 points for no answer or the wrong answer.)

- Q6) The diagram below shows a drawing that Kacy drew of an insect she saw on the jungle trek she went on. Her Science teacher looked at it and said that it was inaccurate. What could be the reason?



- A) All legs of the insect should be joined to the thorax only.  
B) The hind legs of the insect should be joined to its abdomen.  
C) The eyes were too disproportionate to the insect's body.  
D) Wings were missing.
- Q7) Echidnas look like porcupines. They unusually lay eggs and are called monotremes. The female echidna secretes milk through glands instead of teats, to feed its young (called a puggle) which stays in its pouch for another six to eight weeks while its spines harden. Based on the information given above, what other characteristics might an echidna have?
- 1) They are able to regulate their own body temperature.  
2) They have fur on their bodies.  
3) They are cold-blooded.  
4) They give birth to their young alive.
- A) Option 1 and 2  
B) Option 1, 2 and 4  
C) Option 1 and 3  
D) Option 2, 3 and 4

- Q8) Ched was spring cleaning when he noticed that some of the items in his cabinet looked dusty and had a greyish-green 'powder' on it. He made a simple table:

Item	Greyish-green 'powder' present?
Leather shoes	✓
Unused plastic flip-flops	×
Leftover piece of bread	✓
New synthetic leather bag	×
Cardboard box	✓

Which of the following statement(s) is/are true?

- 1) The greyish-green 'powder' is bacteria.
  - 2) Only the items that were never alive did not have the greyish-green 'powder' on it.
  - 3) There would be greyish-green 'powder' on the items if the item could provide it with food.
  - 4) This greyish-green 'powder' would not be present if there was a lack of moisture.
- 
- A) Option 1 and 3
  - B) Option 1 only
  - C) Option 2, 3 and 4
  - D) Option 3 and 4

- Q9) Why are there holes in the bread that we eat?

- A) The baker stretched the dough too much and there were tears in the dough before it was baked.
- B) The good bacteria in the dough were killed in the heat of the oven and produced carbon dioxide which made the holes in the bread.
- C) The yeast added in the dough fed on the sugar in the bread and produced carbon dioxide which left holes in the bread when it is baked.
- D) The yeast reproduced in the bread and made holes in it as it took up space.

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Q10) Some objects were classified in the following groups.

Once alive	Never alive
Photo paper	Water
Makeup cotton pad	Natural rubber boots
Fur rug	Rock
Lego bricks	Lightning rod

Which object(s) is/are grouped wrongly?

	Once Alive	Never alive
A)	Fur Rug	Rock
B)	Lego bricks	Natural rubber boots
C)	Lego bricks	Water
D)	Makeup cotton pad	Water





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**Section C:** (Question 11 to 20: +4 points for correct answer, 0 points for no answer or the wrong answer.)

Q11) Which of the following is not an example of a cycle?

- A) New moon and full moon
- B) Seasons in a year
- C) High tide and low tide of the ocean
- D) Age of a person

Q12) There is a particular species of flower beetle, *Dicronocephalus wallichii*, which digs a hole in the soil to house just one egg. In that nest, it will fill the nest up with cut pieces of dead leaves. Why does it spend the effort to do this?

- A) If the young is developing in nutrient-poor soil, it would still be able to have a source of food.
- B) The dead leaves shield sunlight and helps to keep the nest cool.
- C) The decomposers in the soil break down the leaves and provide sufficient carbon dioxide for the egg.
- D) The dead leaves provide food for the flower beetle adult when it goes back to the nest to check on the eggs.

Q13) Which of the following accurately shows the life cycle of a plant?

- A) Pollination → Fertilisation → Seed dispersal → Germination → Development
- B) Fertilisation → Pollination → Germination → Seed dispersal → Development
- C) Germination → Development → Seed dispersal → Pollination → Fertilisation
- D) Seed dispersal → Germination → Development → Fertilisation → Pollination

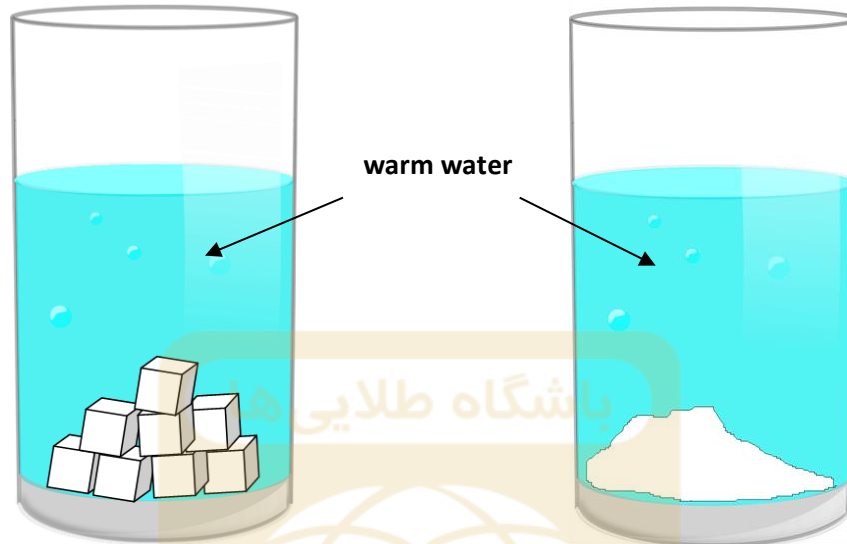
Q14) A scientist collected samples from different parts of a human digestive tract and studied the presence of digestive juices in that part of the body.

Sample	Digestive juices secreted?	Is digestion complete in this part of the body where the sample was taken from?
U	No	Yes
V	Yes	Yes
W	No	No
X	Yes	No
Y	Yes	No
Z	No	Yes

Which of the following shows the correct match of the part the sample was taken from, to the corresponding sample?

A)	Sample V	Stomach
B)	Sample W	Small Intestine
C)	Sample X	Mouth
D)	Sample U	Gullet

- Q15) Jackie did an experiment to find out if sugar dissolves quicker when coarse or fine in texture. She added 2 teaspoons of sugar each, of coarse and fine texture, to 2 separate glasses of warm water of the same temperature. The diagram below shows the experiment.



She then recorded the time taken for the sugar in each glass to completely dissolve while stirring 30 times in each glass and found that the fine sugar crystals took a shorter time to dissolve.

She compared this to a special mechanism in our digestive system, where food is physically changed to enhance the rate of digestion and absorption of digested food.

Which mechanism is this?

- A) Tongue rolling food into small balls
- B) Saliva coating the food
- C) Cutting our food with a fork and knife
- D) Teeth cutting up food

- Q16) Succulents are plants which have parts of them, usually their leaves, that are thick and fleshy, for storage of water. A commonly known succulent is the cactus. Succulents usually grow in arid conditions. Lithops are a type of succulent, stemless and each plant has 2 leaves that are conical and connect directly to tap roots. They grow in clusters. Most of the plant is underground with only the top exposed at the surface of the soil. Because of the way they look, they camouflage and are known as 'living stones'. They originate from southern Africa. Below is a picture of Lithops.



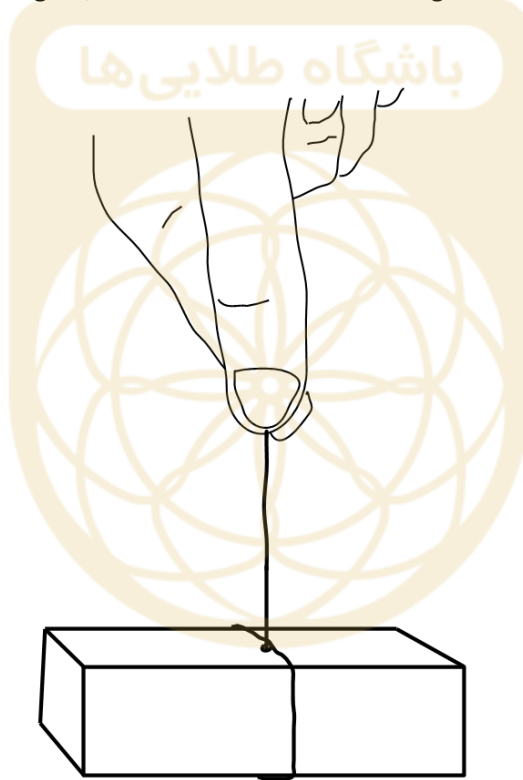
Based on the information above and the picture shown, which of the following statements are true about Lithops?

- 1) They do not have leaves to minimise water loss through transpiration.
  - 2) The 'flat tops' on the plant are cells that act like windows, allowing sunlight to enter deep into the plant where there is more chlorophyll.
  - 3) They draw moisture from mist or fog.
  - 4) They are flowering plants.
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- A) Option 1 and 3
  - B) Option 2, 3 and 4
  - C) Option 1, 2 and 3
  - D) All of the above.

Q17) John loves trekking in the forests. This time, he has forgotten to bring his compass to navigate through the forest on his trek. Without navigation he is unable to reach the main path which will lead him back to the exit. He knows he has to head North to get there. He has some items in his backpack which could be utilised. They are listed below.

- 1) Measuring tape
- 2) Scissors
- 3) Spare bar magnet
- 4) Small ball of hemp string
- 5) Plastic bags
- 6) Coloured ribbons

He chose the spare bar magnet, small ball of hemp string, used the scissors to cut some string and tied it to the bar magnet, so that it looked like the diagram below.



What was the rationale behind what he was making?

- A) A freely suspended magnet will always come to rest at an east-west direction.
- B) He would be able to see the magnet's magnetic field and know where the North Pole is.
- C) The freely suspended magnet will always come to rest in the north-south direction.
- D) Wherever the magnet was pointing would be the direction he needs to head in.

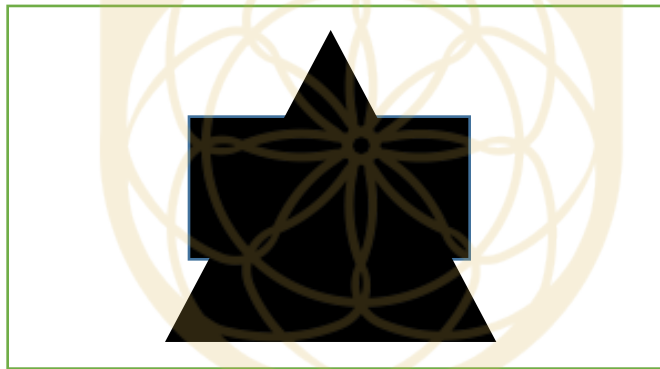
Refer to the following diagram for questions 18 and 19.

- 18) Jerry placed 3 cardboard shapes as shown below, in front of a light source. They are arranged in a straight line one behind the other. The base and height of the triangle, length of the rectangle and the diameter of the circle are all 4 cm.



Diagrams are not drawn to scale

He then observed the shadows formed on the white screen. This is what he saw.

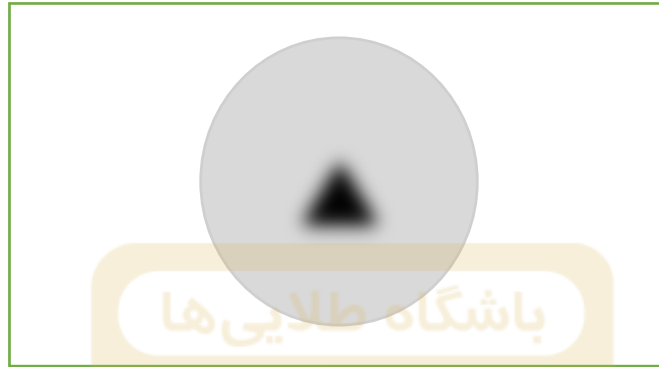


Which of the following is the correct arrangement of the cardboard shapes from the closest to the light source, to the furthest from the light source?

	<b>Closest to the light source</b>	<b>In the middle</b>	<b>Furthest from the light source</b>
A)	Triangle	Circle	Rectangle
B)	Circle	Rectangle	Triangle
C)	Rectangle	Triangle	Circle
D)	Triangle	Rectangle	Circle

- Q19) This time, Jerry cut out the same shapes with the same dimensions and he arranged the shapes one behind the other in a different arrangement compared to the experiment in Q18. However, he used different materials. He used wood, rice paper and cling wrap.

This is what he saw on the screen.



Which of the following is the correct arrangement of the cardboard shapes from the closest to the light source, to the furthest to the light source, and the correct match of its corresponding materials?

	<b>Closest to the light source</b>	<b>In the middle</b>	<b>Furthest from the light source</b>
A)	Rice paper circle	Cling wrap rectangle	Wooden triangle
B)	Wooden circle	Rice paper triangle	Rectangular cling wrap
C)	Cling wrap circle	Wooden rectangle	Rice paper triangle
D)	Cling wrap circle	Wooden triangle	Rice paper rectangle

- Q20) Prema filled up a kettle with water and put it to boil on the stove. When the water was boiling, she observed that there are white 'clouds' forming further away from the spout of the kettle. What are these white 'clouds'?

- A) Dry steam
- B) Air
- C) Water droplets
- D) None of the above

## Rough Working





## Rough Working



## Rough Working

