



# VANDA

## SCIENCE GLOBAL FINALS

### Primary 4 / Grade 4

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 **14** 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) Organic and inorganic matter are found in our everyday lives. Organic matter is matter that is usually derived from living tissues, they can usually be broken down into simpler substances, whereas inorganic matter is not derived from living tissues.

Organic matter	Inorganic matter
Sandstone	Salt
Dead prawn	Fluoride
Yeast	Clam
Cotton	Limestone

The above table consists of 1 item placed incorrectly in each category (organic and inorganic). Which of the following options shows the incorrectly placed objects?

	Organic matter	Inorganic matter
A)	Dead prawn	Clam
B)	Sandstone	Clam
C)	Yeast	Salt
D)	Cotton	Fluoride

Q2) Which of the following phenomena shows that living things respond to changes?

- A) Bread rising while in the oven.
- B) A glass rod bending and breaking under pressure.
- C) Wind blowing onto your face.
- D) A plant growing out of the window.

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Q3) Four students made comments about 3 animals they saw at the zoo.

Betty: Animal A can fly.

John: Animal B feeds its young with milk.

Adam: Animal C lays eggs.

Carol: Animal C has hair on its body.

Which of the following statements is/are true?

- 1) Animal A is definitely a bird.
- 2) Animal C may be a mammal.
- 3) Animal B is a warm blooded animal.
- 4) Animal A is definitely an insect.

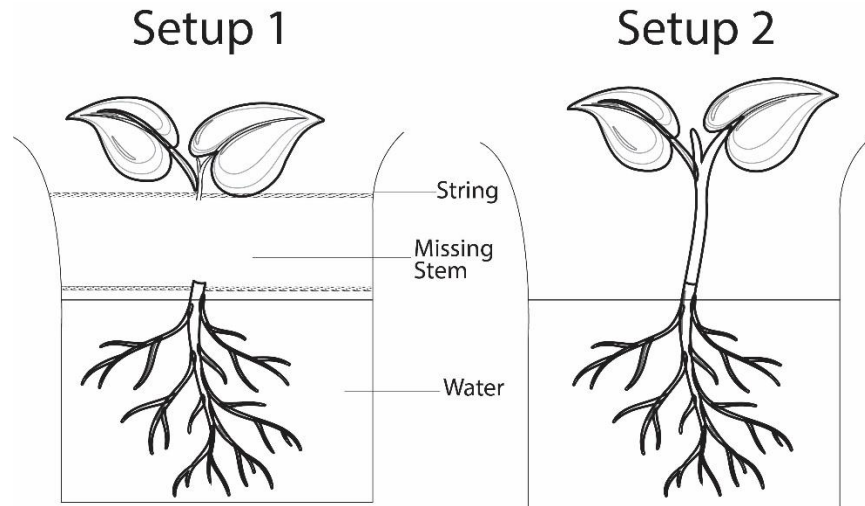
- A) Option 1 and 3 only
- B) Option 3 only
- C) Option 2 and 3 only
- D) Option 2, 3, and 4.

Q4) Which of the following statements are true about the bracket fungus, staghorn fern and hornwort?

- 1) They do not bear flowers.
- 2) They are living things.
- 3) They reproduce by bearing fruits.
- 4) They need moisture to survive.

- A) Option 2 and 4
- B) Option 2 and 3
- C) Option 1, 2 and 4
- D) All of the above

Q5) Alit set up 2 experiments as shown below. He placed both set-ups in an area which was brightly lit and well-ventilated. One of them is the control set-up. He removed part of the plant for set-up 1.



After a few days, he noticed that the plant in Set-up 2 was healthy but the plant in Set-up 1 had died.

What do you think he was trying to find out through this experiment?

- A) To find out if the stem is crucial in photosynthesis.
- B) To find out if the leaves are crucial in photosynthesis.
- C) To find out if the roots can absorb water.
- D) To find out the function of the roots.

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

Refer to the following information and answer questions 6 and 7.

- Q6) Sarah and her family love to go on picnics. They make their own sandwiches and prepare their own drinks before setting out to the picnic. To keep the drinks cold, they use a cooler box to keep their drinks cold. An example of a cooler box is shown below.



What is a key property of the material chosen to make the cooler?

- A) It is a good conductor of heat.
  - B) It is a poor conductor of heat.
  - C) It is strong and heavy.
  - D) It is colourful.
- Q7) Which of the following statements describe how the cooler keeps the drinks cold?
- A) The cooler allows heat from the inside of the cooler to conduct quickly and so, heat reaches the drinks in the cooler faster, therefore keeping it cold.
  - B) The cooler prevents heat from the surrounding air from passing through quickly and reaching the drinks inside, therefore keeping the drinks inside the cooler cold.
  - C) The cooler allows heat from the surrounding air to pass through quickly and reach the drinks inside, allowing a heat gain in the drinks keeping it warm.
  - D) The cooler prevents heat from the surrounding air from passing through quickly and reaching the drinks inside, which causes the cooler to gain heat and the drinks stay cold.

Q8) Which of the following is not an example of matter?

- A) Wind
- B) Rice
- C) Stone
- D) Shadow

Q9) Lily brewed a cup of tea and covered it with a glass lid. She noticed after a few mins there were water droplets forming on the underside of the glass lid.

Which process(es) were involved in this observation, from the moment she has poured the hot water into the cup until she covers the lid?

- 1) Melting
  - 2) Condensation
  - 3) Evaporation
  - 4) Sublimation
- 
- A) Option 2 and 3
  - B) Option 1 and 2
  - C) Option 1, 2 and 3
  - D) Option 1, 2, 3 and 4

Q10) Which of the following does not involve heat gain?

- A) Formation of clouds
- B) Boiling water
- C) Dry Ice solid becoming gas
- D) Ice cream melting in the sun

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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 incorrect about the life cycles of a dolphin and a shark?

- A) Dolphins give birth to young alive.
- B) Both sharks and dolphins have a 3-stage life cycle.
- C) All sharks lay eggs.
- D) The mother nurses and cares for the new-born calf.

Q12) The young of some sharks, like the shortfin mako and the sand tiger shark, eat their siblings while in their mother's womb.

Female sand tiger sharks, like many animals, mate with multiple males. This results in young being fathered by different males. In order to ensure that the young being born is one of maximum fitness, nature selects the first-hatched embryo to cannibalise its siblings when in the womb, so that it can grow exponentially.

Why is there a need for this to happen?

- A) There are specific nutrients provided by the other embryos which the first hatched embryo requires for survival.
- B) There is insufficient space in the mother shark's womb.
- C) There is absolutely no nutrition provided by the mother shark.
- D) This is to ensure the species' continuity, as the fittest offspring will pass down its DNA which is considered the 'best' quality to future offspring.



- Q13) Would it be possible to use a permanent magnet instead of an electromagnet in a junkyard, as shown below? Why?



- A) Yes, as the permanent magnet is stronger and is able to hold more junk items at one time.
- B) No, it is permanent and cannot fulfil its purpose of moving junk items to its respective areas.
- C) Yes, it is cheaper and easier to use, and can transport more junk items at one time.
- D) No, the permanent magnet and the electromagnet works the same and has the same strength, it is not necessary to use a permanent magnet.

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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?
A	No	Yes
B	Yes	Yes
C	No	No
D	Yes	No
E	Yes	No
F	No	Yes

Which of the following correctly shows the sequence of food moving through the digestive system?

- A) B → E → D → C → A → F
- B) D → C → E → B → F → A
- C) A → F → C → D → E → B
- D) C → E → D → B → F → A

Q15) Which of the following is a natural source of light?

- A) Torchlight
- B) Moon
- C) Sky
- D) A star

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.

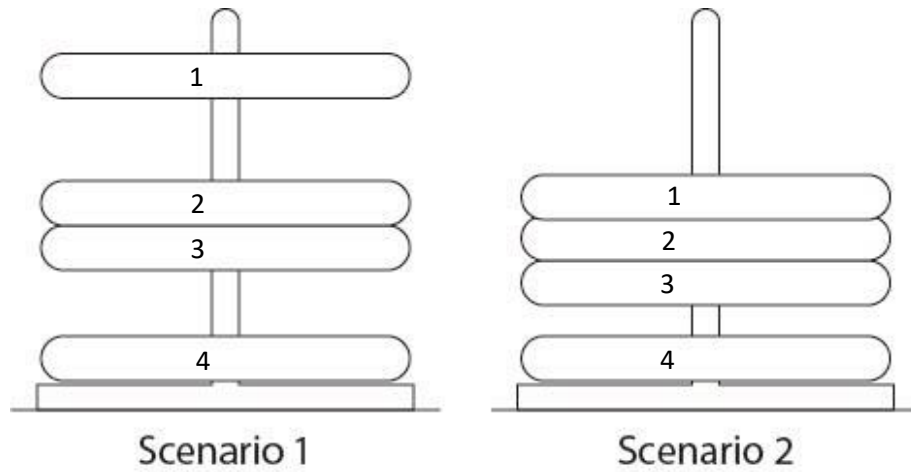


Based on the information above and the picture shown, which of the following statements are true about Lithops?

- 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.

- A) Option 1 and 3
- B) Option 2, 3 and 4
- C) Option 1, 2 and 3
- D) All of the above.

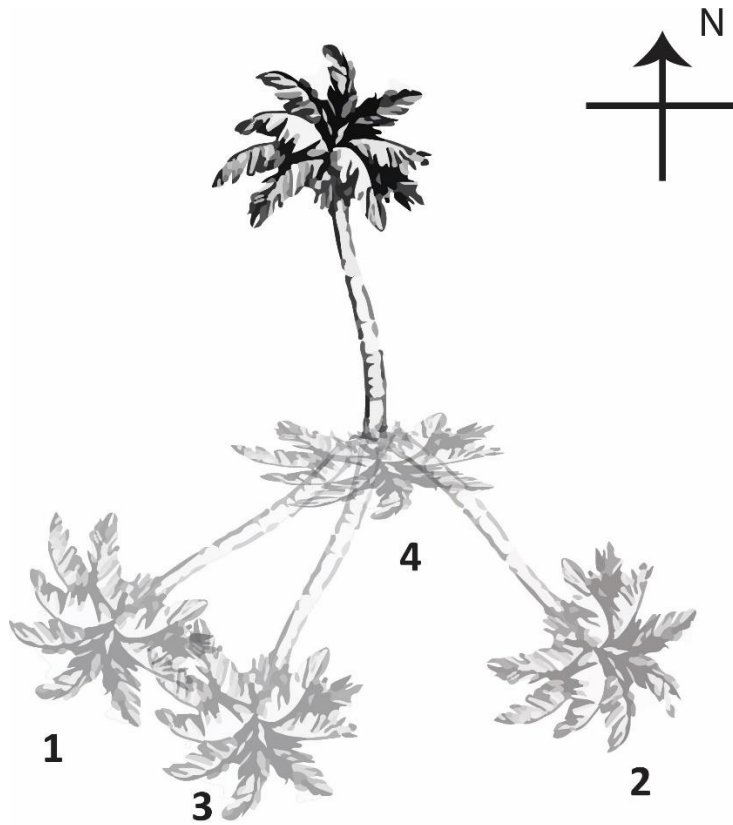
Q17) Jessie placed 4 rings onto the levitation tower as shown in the diagrams below, she arranged it differently in 2 separate scenarios.



She says that one of the discs used is a non-magnetic material.  
Which disc is this?

- A) 2
- B) 1
- C) 3
- D) 4

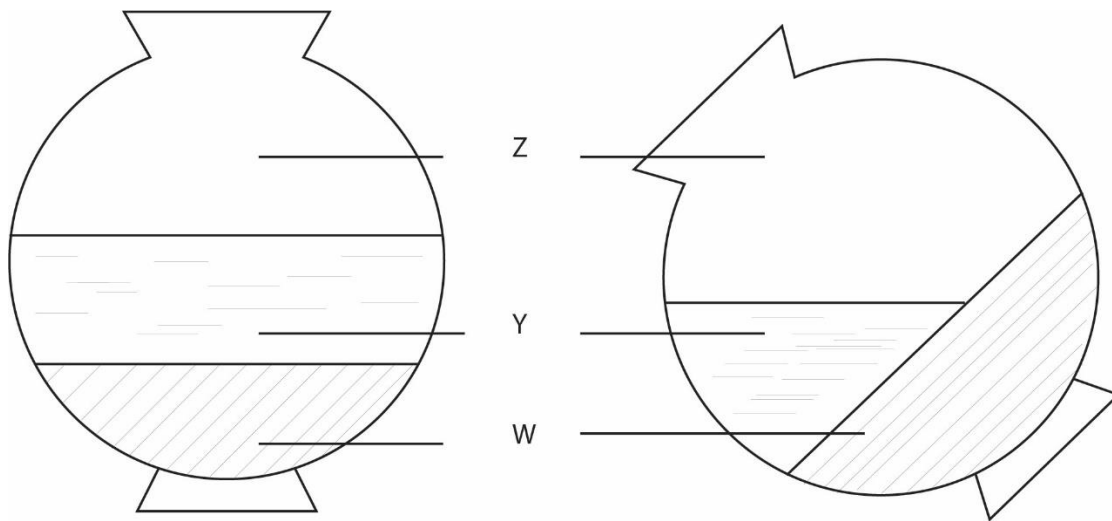
Q18) A coconut tree is under the sun in the day time as shown in the diagram below.



Which positions of the shadows correctly match their time of the day?

	10am	11:30am	12 noon	2:30pm
A)	1	4	3	2
B)	2	3	4	1
C)	1	3	4	2
D)	3	4	2	1

Q19) Meng Xi has two vases filled with 3 substances W, Y and Z. Both vases are sealed with an airtight lid. What could these substances be?



	<b>W</b>	<b>Y</b>	<b>Z</b>
A)	Snow	Thick jelly	Hydrogen
B)	Ice	Mud	Mercury
C)	Coffee	Molten iron	Water vapour
D)	Cement	Milk	Air

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