



**STUDENT NAME:** \_\_\_\_\_ **ROLL NO.:** \_\_\_\_\_

**ROLL NO:** \_\_\_\_\_

**SCHOOL NAME:** **SECTION:**

## **SECTION:**

**PZONGKHAG:** **GENPER:**

## GENDER:

## SCIENCE

## Reading Time: 15 Minutes

## Full Marks: 70

## Writing Time: 1 1/2 Hours

Year: 2021

**For teacher's use only**

Question	Q1	Q2	Q3	Q4	Q5						Q6				Q7	
					a	b.i	b.ii	b.iii	c	d	a	b	c	d	a	b
Mark	10	7	6	7	2	1	1	1	2	1	2	2	2	2	2	1
Mark scored																
Total Score																

**IMPORTANT:** Turn over to read instructions.

## **READ THE FOLLOWING INSTRUCTIONS CAREFULLY:**

1. In this booklet you will find **NINE** questions. You must answer **ALL** the questions.
2. Answers to all the questions must be written neatly in the spaces provided.
3. Do not write during the first fifteen minutes. This time is to be spent on reading the questions.
4. You will have **ONE and HALF** hour to answer all the questions.
5. You will **NOT** be allowed to leave the examination room until the completion of the stipulated time.

(First **FIFTEEN** minutes could be used by the teachers on duty to explain the instructions)

## Section A (30 Marks)

### Question 1

[10]

**Direction: For each question, there are four alternatives: A, B, C and D. Choose the correct alternative and circle it. Do not circle more than ONE alternative. If there are more than one choice circled, NO score will be awarded.**

- i. Every cell organelle has its own function. The organelle which prepares food and can be compared to a kitchen is
  - A mitochondria.
  - B chloroplast.
  - C nucleus.
  - D vacuole.
- ii. In an accident, a man dislocates his knee joint and cannot swing his legs. The movable joint affected is
  - A ball and socket.
  - B gliding.
  - C hinge.
  - D pivot.
- iii. In Bhutan, farmers in the north grow potatoes while farmers in the south grow ginger. These cash crops are grown by vegetative propagation of
  - A leaves.
  - B roots.
  - C seeds.
  - D stems.

iv. Animals living in different habitats have different adaptive features such as:

- I. strong hooves
- II. big horns
- III. long neck
- IV. thick fur

For an animal to thrive at high altitudes, the adaptive features required are

- A I and II.
- B II and IV.
- C I and III.
- D I and IV.

v. The maximum number of electrons a shell of an atom can accommodate can be calculated by using  $2n^2$  rule where 'n' is number of shells. According to the rule, the maximum number of electrons N shell can accommodate is

- A 8.
- B 18.
- C 32.
- D 50.

vi. When a person suffers from a high fever, doctors recommend to put a cloth soaked in cold water on the forehead. This is because the soaked cloth will

- A release heat and reduce fever.
- B absorb heat and reduce fever.
- C hydrate the person and reduce fever.
- D dehydrate the person and reduce fever.

vii. Samdrup lives in Bumthang. He has an urgent meeting to attend at 10 AM in Thimphu. The distance between Bumthang and Thimphu is 104 kms. If Samdrup starts his journey at 6 AM, at what average speed should he travel to reach Thimphu by 10 AM on the same day?

A 24 kms/hr  
B 26 kms/hr  
C 28 kms/hr  
D 30 kms/hr

viii. Air ventilators remove smoke, fumes, dirt, odours and warm air from a closed room.



The best point for fitting the air ventilator on the kitchen wall would be

A Q.  
B P.  
C R.  
D S.

ix. Water heating coils are one of the most common heating appliances used at homes in Bhutan. It converts electrical energy to heat energy and can be easily made with some basic materials.

From the four metals with the same melting point of  $1200^0\text{C}$ , which metal would you chose to make a water heater?

- A Metal W – 3 ohms
- B Metal X – 6 ohms
- C Metal Y – 9 ohms
- D Metal Z – 12 ohms

x. The stars appear to twinkle and change their brightness though they actually do not. This is due to the

- A converging of light.
- B dispersion of light.
- C reflection of light.
- D refraction of light.

## Question 2

[7]

**Direction: Fill in the blanks with appropriate words.**

- i. A bucket tied to a rope is swung in a circular motion. The force produced in the rope is \_\_\_\_\_.
- ii. The part of the ear which collects sound waves from the surrounding is \_\_\_\_\_.
- iii. A farmer observes ladybirds feeding on aphids in her vegetable garden. This is an example of \_\_\_\_\_ pest control.
- iv. Weeding is done in order to prevent \_\_\_\_\_ competition between the weeds and crops.
- v. The number of neutrons in  $_{11}\text{Na}^{23}$  is \_\_\_\_\_.
- vi. A wrist watch uses \_\_\_\_\_ current.
- vii. A green object placed in red light will appear \_\_\_\_\_.

**Question 3****[6]**

**Direction: Match each item in column I against the most appropriate item in column II. Write only the alphabet against the number in the space provided below.**

Column I	Column II
i The base which undergoes complete ionization	a radiation
ii Preparation of lemon grass oil	b NaCl
iii Common salt	c speed
iv The quantity with both magnitude and direction	d water
v The fastest mode of heat transfer	e distillation
vi Renewable energy	f velocity
	g NaOH
	h decantation

i	
ii	
iii	
iv	
v	
vi	

**Question 4****[7]****Direction: Write TRUE or FALSE against each statement in the space provided.**

- i. Cardiac muscle is involuntary in nature and it works non-stop.  
(\_\_\_\_\_)
- ii. Diffusion is an example of active transport. (\_\_\_\_\_)
- iii. A convex lens is thinner at the center and thicker at the edges.  
(\_\_\_\_\_)
- iv. A fuse is always connected in series to the live wire. (\_\_\_\_\_)
- v. According to Ohm's law, voltage and current are inversely proportional.  
(\_\_\_\_\_)
- vi. Peristalsis helps in the movement of food through the esophagus.  
(\_\_\_\_\_)
- vii. In grafting, the plant receiving the bud or shoot is called stock.  
(\_\_\_\_\_)

## Section B (40 Marks)

**Direction:** Answer the following questions in the spaces provided. The marks for each question are given in the brackets [ ].

### Question 5 [8]

a. Draw a plant cell and label any **TWO** cell organelles that are found **ONLY** in a plant cell. [2]

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b. The diagram given below represents air pollution.



i. Write any **TWO** activities that cause air pollution. [1]


ii. Mention any **TWO** health impacts of air pollution.

[1]


iii. As a student what can you do to minimize air pollution? Give **TWO** points.

[1]


c. “..... *Although chilli is indispensable to Bhutanese diet, Lyonchhen Dr Lotay*

[2]

*Tshering said that the cabinet did not lift the ban on its import because .....*”

- Kuensel (January 30, 2021)

The import of chilli from India is still banned in Bhutan. Give **TWO** reasons.


d. Ducks are more suited to live in water than hens. Justify with **ONE** point. [1]


## Question 6 [8]

a. The government of Bhutan has lifted the ban on the sale and use of tobacco products. [2]  
Is this a wise decision? Justify with **TWO** points.


b. Roots absorb water through the process of osmosis. [2]

Using *pumpkin, knife, water, pins, beaker, marker pen and salt solution* design an experiment with a labelled diagram to demonstrate the process.

c. Bhutan's constitution mandates that a minimum of sixty percent of country's land should be maintained under forest cover for all the times to come. Can Bhutan maintain the required forest coverage with increasing modernization and development? Give **TWO** reasons. [2]


d. Write the chemical formula of the compound formed when the following radicals combine. [2]

- $\text{Ca}^{2+}$  and  $\text{NO}_3^-$
- $\text{NH}_4^+$  and  $\text{Cl}^-$

i.	
ii.	

### Question 7 [8]

a. In the chemical reaction,  $\text{A} + \text{BC} \longrightarrow \text{AC} + \text{B}$ , the total mass of the reactants is 100 g. What will be the total mass of the products? Justify your answer. [2]


b. Due to COVID-19 pandemic, wearing of face masks is now compulsory. How does a facemask prevent the entry of corona virus? [1]


c. While working in a garden at home, you are stung by a bee. What home remedy will you use? Why? [2]


d. Give a scientific reason for the following: [2]

- People use flat ropes to carry loads.
- Velocity of a person walking in a circular path is zero.

i.	
ii.	

e. Between the two safety devices given below, which one do you prefer to use? Give [1]  
**ONE** reason.



Miniature circuit breaker (MCB)



Fuse


**Question 8 [8]**

a. Suggest a way to increase pitch in the following musical instruments: [2]

- Guitar
- Flute

i.	
ii.	

b. If the Sun suddenly disappears, will the planets in the solar system still travel in the same orbits? Justify with **ONE** point. [2]


c. Though the atoms are composed of positively and negatively charged particles, the overall charge of an atom is neutral. Give **ONE** reason. [1]

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d. Using your knowledge of electricity and magnetism, design a tool to fix a dented car. [2]



e. Name the gas formed when a metal reacts with an acid.

[1]


**Question 9 [8]**

a. A man weighs 720N on Earth. What would be his weight on the Moon?

[1]


b. Most of the local crops in Bhutan are now replaced by the hybrid crops. Is it a good

[2]

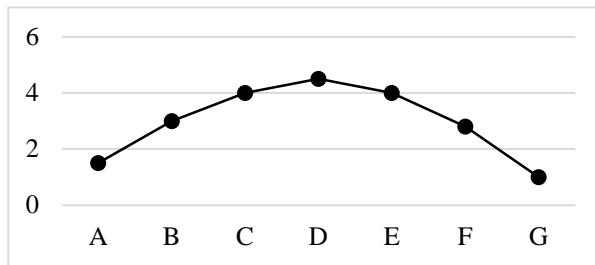
trend? Justify with **TWO** reasons.


c. Three tube lights of 50 watts each and a geyser of 500 watts are connected to 220V. [2]  
These appliances are used on an average of 10 hours a day. If the cost of the energy is Nu. 2.5 per kWh, calculate the electricity bill for a day.

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d. What is focal length? [1]


e. The graph given below represents a *deygor* thrown by Pema during a local festival. Pema stood at point A to throw the *deygor* and it landed at point G. Study the graph and answer the following questions.



i. At what point is the potential energy maximum? Why? [1]


ii. Where will the *deygor* have lesser kinetic energy, point E or F? Why? [1]
