

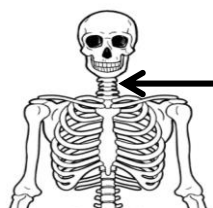
SECTION A [30 MARKS]
ANSWER ALL QUESTIONS

Question 1

[15]

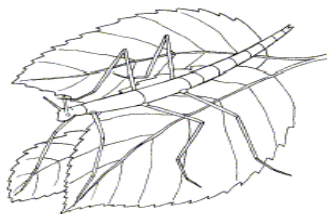
- a) **Direction: For each question, there are four alternatives: A, B, C and D. Choose the correct alternative and circle it. Do not circle more than ONE alternative. If there are more than one choice circled, NO score will be awarded.**

- i. Human skeletal system consists of many types of joints. The movable joint indicated with the arrow below is



- A pivot.
B hinge.
C gliding.
D ball and socket.
- ii. Following are the steps for writing a chemical formula of simple radicals.
- I. Interchange the valencies of the radicals
 - II. Write the valencies of each radical above their symbols
 - III. Determine the valencies of radicals
 - IV. Write the formula of the compound
- The correct sequence of writing chemical formula is
- A I, II, III, IV.
B I, III, IV, II.
C III, II, I, IV.
D III, I, II, IV.
- iii. New roots and stems grow from the tip of roots and shoots respectively. The tissue that enables such growth in plants is
- A parenchyma.
B collenchyma.
C sclerenchyma.
D meristematic.

- iv. The colour of a stick insect resembles the colour of dry leaves as shown in the diagram below.



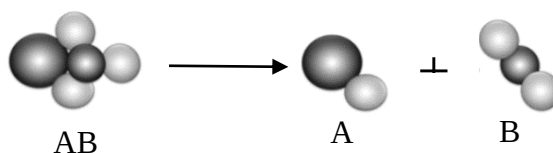
This enables the stick insect to

- A attract a mate.
 - B feed on the leaves.
 - C compete with birds.
 - D hide from predators.
- v. The number of particles in four different atoms are shown below.

Atom	Number of protons	Number of neutrons	Atomic mass
W	5	5	10
X	6	6	12
Y	6	7	13
Z	7	7	14

Identify the two isotopes.

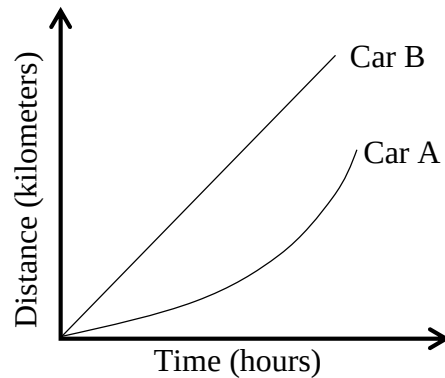
- A W and X
 - B X and Y
 - C Y and Z
 - D Z and W
- vi. During a chemical reaction, the bonds between atoms break and new bonds are formed.



The type of chemical reaction shown in the above equation is

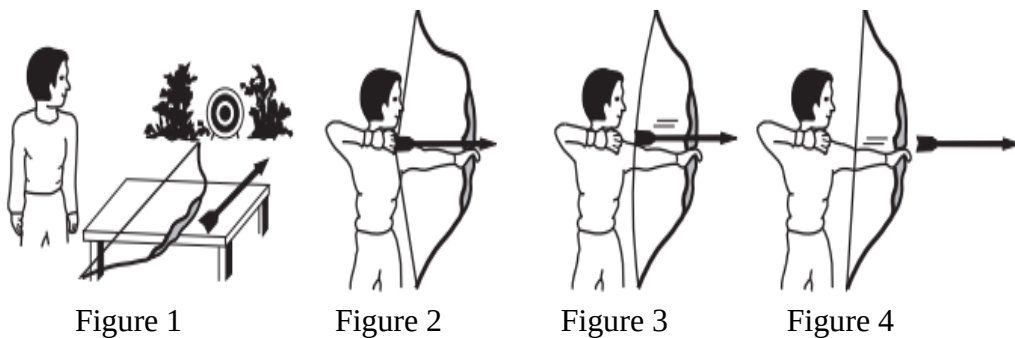
- A substitution.
- B combination.
- C displacement.
- D decomposition.

- vii. Car A and B moved from the same spot and their time of arrival at a particular destination was recorded. Their distance-time graph is as shown below.



What can you conclude from the distance-time graph?

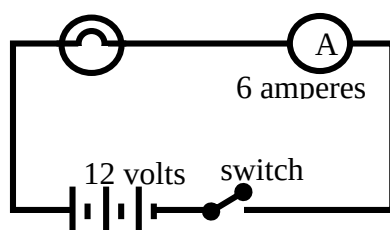
- A Both cars are in the state of uniform motion.
 - B Both cars are moving with the same speed.
 - C Car B is faster than Car A.
 - D Car A is faster than Car B.
- viii. A person uses a bow to shoot an arrow at a target.



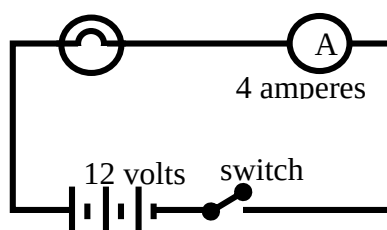
In which figure does the bow and arrow have the greatest amount of potential energy?

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

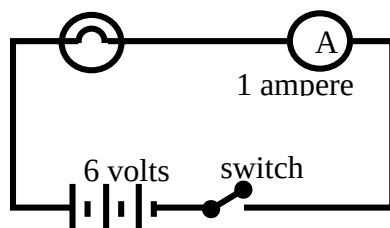
- ix. Four circuits with varied potential difference and current are given below.



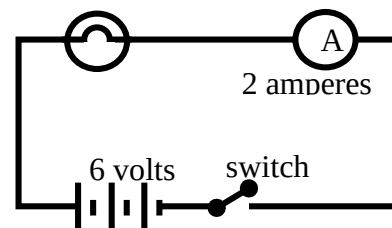
Circuit 1



Circuit 2



Circuit 3



Circuit 4

When the switch is closed, which circuit will offer the greatest resistance to the current flow?

- A Circuit 1
 - B Circuit 2
 - C Circuit 3
 - D Circuit 4
- x. Speed of sound depends on various factors.
- I. **Temperature:** Sound travels faster in mediums with higher temperature
 - II. **Nature of medium:** Sound travels faster in a liquid than in a solid
 - III. **Wind:** Sound travels faster in the opposite direction of wind
 - IV. **Elasticity:** Sound travels faster in higher elastic medium

The factors with the correct descriptions are

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

- xi. The practice of inorganic farming is unsafe for aquatic organisms due to
- A eutrophication.
 - B increased biodiversity.
 - C enhance aquatic habitat.
 - D nutrient balance in water.
- xii. Chlorine gains one electron to stabilise its
- A ionisation energy.
 - B valence electron.
 - C atomic number.
 - D atomic mass.
- xiii. Which of the following technique is best applicable for separating a mixture of water and dust particles?
- A chromatography
 - B evaporation
 - C distillation
 - D filtration
- xiv. Class VIII students observe a mixture of a solid in a solvent. The easiest way to differentiate whether the mixture is homogeneous or heterogeneous is to
- A compare the physical properties of the mixture.
 - B dissolve the mixture in water and observe if it forms a clear solution.
 - C observe if the components of the mixture can be easily separated by filtration.
 - D heat the mixture and observe if the components have different boiling points.
- xv. Which of the following is true about the speed of the light and sound?
- A sound travels faster than light in all media
 - B light travels faster than sound in all media
 - C light and sound travel at the same speed in a vacuum
 - D light and sound travel at the same speed in all media

b) Direction: Fill in the blanks with appropriate words. [5]

i.	When spinning a ball on a string, the force of tension on the string pulls the ball towards the centre. This is called _____ force.	
ii.	The muscle that is branched, striated and works continuously is _____ in nature.	
iii.	Magnets have various applications in our daily lives. The magnet used in an electric bell is _____.	
iv.	Animals that produce better yields and have high resistance to diseases are called _____.	
v.	The primary colours of light are red, blue and green. If a girl wears a red tigo, her tigo will look _____ in green light.	

c) Direction: Match each item in column I against the most appropriate item in column II. Write the correct letter in Column III. [5]

Column I	Column II	Column III	
i. Atomic size decreases from left to right across the period	a. conduction	i.	
ii. Separation of a liquid mixture having different boiling points	b. vector quantity	ii.	
iii. Total number of protons and neutrons in an atom	c. nuclear charge	iii.	
iv. Rate of change of velocity	d. mass number	iv.	
v. Cooking utensils are made of metals	e. filtration	v.	
	f. atomic number		
	g. non-renewable		
	h. distillation		

d) Direction: Write TRUE or FALSE against each statement in the space provided. [5]

i.	The method used to prepare lemon grass oil is simple distillation.	
ii.	A plant will wilt on adding saline water. This is due to osmosis.	
iii.	The current rating of fuse should be equal to the current flowing in the circuit.	

iv.	In a vacuum, different colours of light travel at different speeds.	
v.	An iron can be magnetised by stroking it several times with a strong permanent magnet.	
vi.	Growth of a new jade plant from its fallen leaves is an example of sexual reproduction.	
vii.	Instant withdrawal of hand from a hot object is enabled by nerve cells.	

SECTION B [50 MARKS]
ALL QUESTIONS ARE COMPULSORY

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

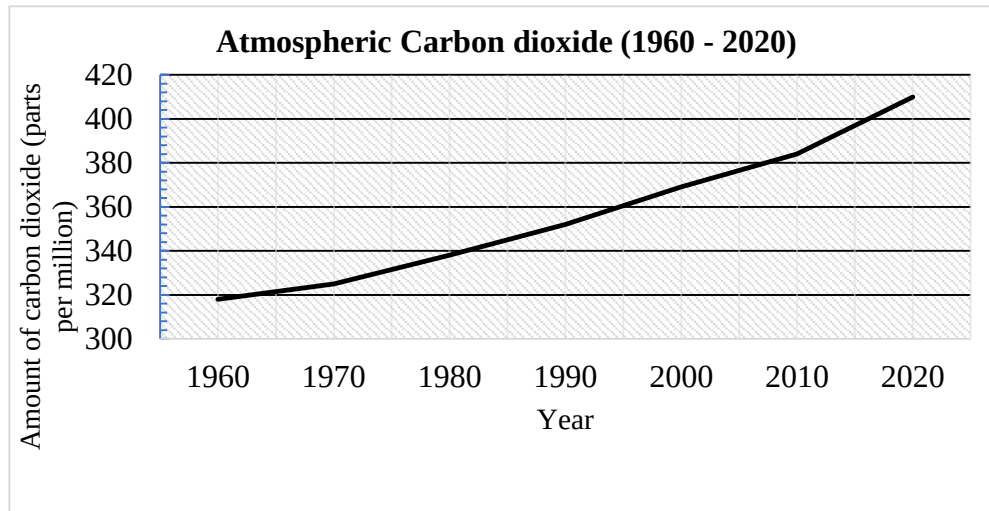
Question 2

- a) Design an experiment to show how lemon can be grown on an orange tree. **[2]**

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- b) Physical health is more important than mental health. Do you agree? Justify with **TWO** points. **[2]**

- c) The graph below shows the concentration of carbon dioxide in the Earth's atmosphere from 1960 to 2020.



- i. What is the trend of carbon dioxide being released over the years? [1]

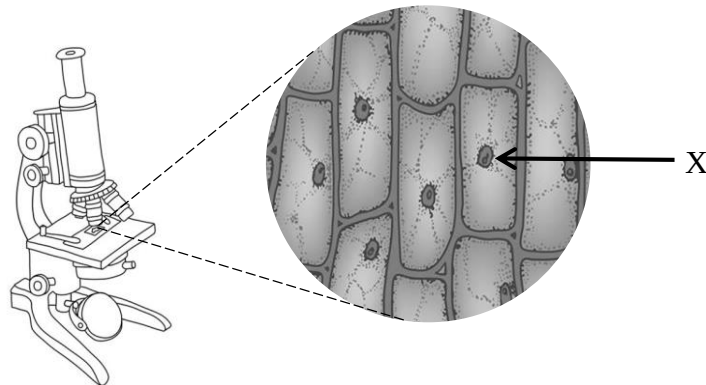
- ii. Frame **TWO** strategies to address this environmental issue. [2]

- d) Generally, people use the phrase ‘Sun rises in the east and sets in the west’. **[2]**
Comment on this statement with **TWO** scientific evidences.

- e) Smoking in public places is restricted. Give **ONE** scientific reason for imposing such a restriction. **[1]**

Question 3

- a) The diagram below illustrates the observation of a tomato peel under a microscope.



- i. Explain **ONE** importance of part X. [1]

- ii. How is part X different from mitochondria? [1]

- b) Despite the government's restriction on harvesting Cordyceps during off seasons, some people continue harvesting it throughout the year.

- i. How is this a threat to the sustainability of Cordyceps? [1]

- ii. It is important to use natural resources judiciously. Do you agree? Support your stand with **TWO** points. [2]

- c) The atomic size of aluminium is slightly smaller than the size of sodium. With reference to this statement, what can you conclude about the electronegativity of atoms across the period? [2]

- d) Most of the electrical appliances are connected with earth wire. How does this prevent from electric shock? [1]

- e) Show with the help of a ray diagram how an image is enlarged with a hand lens. [2]

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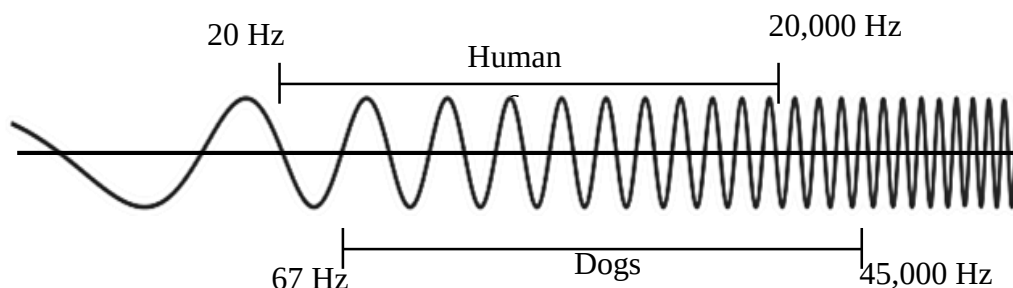
Question 4

- a) Is freezing of water an endothermic or exothermic reaction? Explain. [2]

- b) Balance the chemical equations given below. [1]

i.	$\text{Mg} + \text{O}_2 \longrightarrow \text{MgO}$	
ii.	$\text{H}_2\text{SO}_4 + \text{NaOH} \longrightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$	

- c) The diagram given below shows the frequency of sound and the average audible range of dogs and humans.



Complete the table below to show the audibility of sound. Indicate with a (✓) for audible and (✗) for not audible. [2]

Device	Frequency (Hz) produced by the device	Human	Dog	
Whistle 1	23,000 – 54,000	()	()	
Whistle 2	3,000 - 5000	()	()	

- d) An unknown element is represented as ${}_{17}\text{X}^{35}$.

- i. Write the electronic configuration of the element. [1]

- ii. What is the valency of the element? [1]

- e) Ohm's law states that the voltage across a conductor is directly proportional to the current. Using the symbols given below, draw the circuit diagram to infer the law. [2]

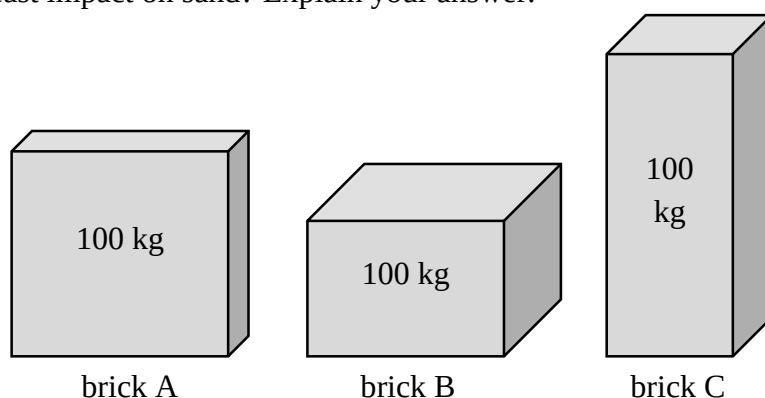
Switch		Wire	
Cell		Voltmeter	
Ammeter		Resistor	

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- f) The gravity on the Earth is greater than on the Moon. Why? [1]

Question 5

- a) The diagram below shows three bricks resting on sand. Which brick would have the least impact on sand? Explain your answer. [2]



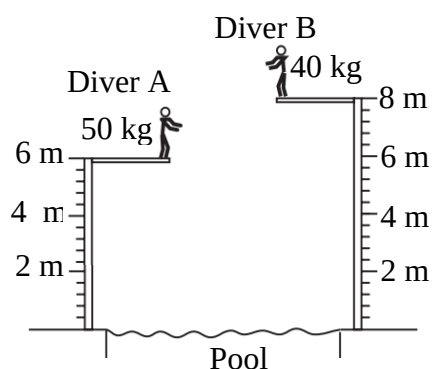
- b) An element with 16 protons gains one electron to become stable.

- i. Is the element a metal or a non-metal? [1]

- ii. Does it acquire a positive or a negative charge? [1]

- c) 'Fluid friction increases with the viscosity of the liquid'. Support the statement with a suitable example. [2]

- d) The diagram below shows two divers ready to dive into a pool.



- i. Which diver has more potential energy? Write **ONE** reason. [1]

- ii. Calculate the potential energy of diver A. [2]

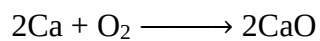
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- e) Salt is added in the water until no more salt can be dissolved. Suggest **ONE** way to increase the solubility. [1]

Question 6

- a) Calcium and oxygen combine chemically to form calcium oxide. Prove the law of conservation of mass using the equation given below. [2]

[mass of Ca=40g, mass of O=16g]



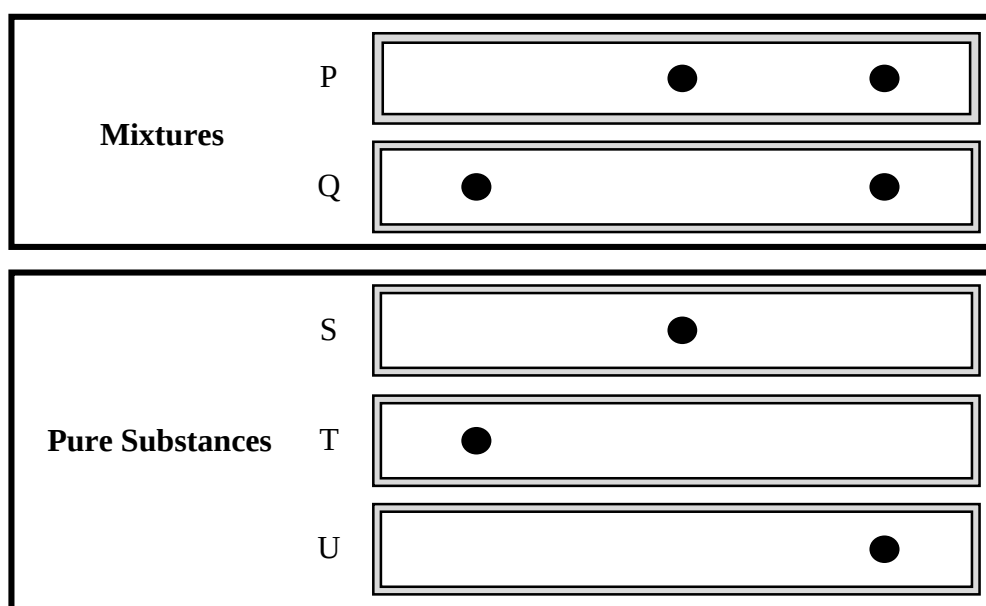
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- b) Rusting of iron is a slow process that takes place in the presence of oxygen and moisture. Mention **TWO** reasons why it a chemical change. [2]

- c) Though H_2 and He are gaseous elements, they have different properties. How are they different in terms of reactivity and atomicity? [1]

	H_2	He	
Reactivity			
Atomicity			

- d) Figures below show the results of a chromatography experiment.



- i. Identify the pure substances in mixture P. [1]

- ii. Write **ONE** application of chromatography in forensic. [1]

- e) Asexual reproduction is more efficient than sexual reproduction. Do you agree? **[2]**
Support your answer with **TWO** points.

- f) Compare the size of a Na atom with Na ion. **[1]**

