FIRST MOCK EXAMINATION MARKING SCHEME

SCIENCE

QUESTION 1

(a) i. Title for the experiment

Rectilinear propagation of light. **2 marks**

ii. What happens when the middle board is shifted.

The light is cut off from reaching the observer behind the third cardboard. **2 marks**

iii. Conclusion drawn from the experiment

It can be concluded that, light travels in a straight line. **2 marks**

iv. Applications of the experiment

* Formation of eclipses.

* Understanding how light travels in straight lines helps in designing lenses and optical systems for cameras, telescopes, microscopes, and other imaging devices.

* The rectilinear propagation of light enables the formation of clear and focused images on film or digital sensors, which are the basis of photography and cinematography.

* The study of how light travels helps in optimizing solar energy capture and concentration in solar panels and solar collectors.

2 marks each × any 2 = 4 marks

(b) **i. Identify the cells A and B**

Cell A - Plant cell

Cell B - Animal cell **1 mark each = 2 marks**

ii. Name each of the parts labeled I, II, III, and IV.

I - Vacuole

II - Cell membrane

III - Nucleus

IV - Cytoplasm **1 mark each = 4 marks**

iii. **What is the role of the cellulose cell wall in cell A?**

The cellulose cell wall provides strength and support to the cell. **2 marks**

iv. **State one function each of the parts labeled III and IV**.

Part III (Nucleus) - It controls the activities of the cell. **1 mark**

Part IV (Cytoplasm) - It is the site for chemical reaction in the cell.

It facilitates the movement of substances in and out of the cell

1 mark × any 1 = 1 mark

(c) **i. Identity A, B and C**

A - Pre-molar or Molar (Cheek teeth)

B - Incisor

C - Canine **1 mark each = 3 marks**

ii. **Name the parts labeled I and II in A**.

I - Crown

II - Root **1 mark each = 2 marks**

iii. **State the functions of A, B and C in relation to their diet.**

A (Pre-molar or molar) - Used for grinding and crushing food.

B (Incisor) - Used for cutting food.

C (Canine) - Used for biting and tearing food.

1 mark each = 3 marks

iv. Mention two diseases that affect the diagram above.

* Gum disease

* Tooth decay **1 mark each = 2 marks**

(d) **i. Identify each of the crops A, B, C and D**.

Crop A - Garden egg

Crop B - Cassava

Crop C - Bean

Crop D - Maize **1 mark each = 4 marks**

ii. **Use the principles of crop rotation to draw-up a four year crop rotation plan.**

Year	Plot 1	Plot 2	Plot 3	Plot 4
1	B	C	A	D
2	C	A	D	B
3	A	D	B	C
4	D	B	C	A

4 marks

iii. **What is the importance of crop C in the rotation plan?**

Nitrogen fixing bacteria live in the root nodules of crop C. The activities of these bacteria enrich the soil with nitrates which maintain or improves the fertility of the soil.

1 mark

iv. Give one advantage a farmer is likely to gain by adopting the crop rotation plan.

* Soil erosion is controlled
* Soil fertility is maintained or improved
* Pests are easily controlled.

1 mark × any 1 = 1 mark

QUESTION 2

a. i. Define magnetic field

A magnetic field is a region in space where magnetic forces are experienced by magnetic objects, such as magnets or charged particles.

2 marks.

ii. Properties of magnetic lines of force.

* Magnetic lines of force move from the north pole to the south pole.
* They are closest at the poles.
* They are parallel to each other.
* They can pass through non-magnetic substances placed on their paths.

1 mark each × any 2 = 2 marks

b. i. Tabulate two differences between heat and temperature

Heat	Temperature
It is expressed in joules	It is expressed in degree celcius or kelvin
It is measured with calorimeter	It is measured with a thermometer
It describes how much thermal energy is contained in a body	It describes how hot or cold a body is.
It is a form of energy	It is not a form of energy

0.5 mark each × any 2 = 2 marks

ii. Modes of through which heat can be transferred.

* Conduction
* Radiation
* Convection **1 mark each × any two = 2 marks**

c. **Mass of the fruit.**

Height = 20 m

Potential energy(PE) = 600J
Gravity = 10 m/s^2
mass = ?

PE = mass × gravity × height
600 = m × 10 × 20 **1 mark**
600 = 200m
m = 3 kg
1 mark

d. i. **Three macronutrients needed by plants.**
* Nitrogen
* Phosphorus
* Potassium
* Magnesium
* Calcium
* Sulphur **1 mark each × any 3 = 3 marks**

ii. Explanation of refraction of light.
Refraction of light is a phenomenon that occurs when light passes through a medium with a different optical density, such as air to water or glass. As light travels through the interface between the two mediums, its speed changes, causing the light rays to bend or change direction.
2 marks

QUESTION 3

a. i. What are cultural practices?
Cultural practices refer to the traditional methods and techniques that farmers and agricultural communities employ to cultivate crops, raise livestock, and manage their agricultural systems.
2 marks

ii. Importance of pruning
* Encourages new growth.
* Improves air circulation.
* Enhances fruit production.
* Controls plant size and shape.
* Reduces risk of disease. **1 mark each × any 3 = 3 marks**

b. Digestion process of protein.

When you eat protein-rich food, your stomach's acid denatures the proteins, then enzymes break them into smaller peptides in the stomach, and finally in the small intestine, more enzymes break the peptides into individual amino acids that your body absorbs and uses for various functions.

3 marks

c. i. What is compost ?

Compost is a nutrient-rich, organic material that forms through the decomposition of organic waste, such as food scraps, yard trimmings, and other biodegradable materials.

2 marks

ii. Importance of using green manure.

* Building soil organic matter and soil structure.
* Supplying nitrogen and other nutrients to a crop.
* Preventing leaching of soluble nutrients from the soil.
* Providing ground cover to prevent damage to soil structure.
* Bringing crop nutrients up from lower soil profiles.
* Smothering weeds and preventing weed seedling growth.

1 mark each × any 3 = 3 marks

d. Correct order for life cycle of a housefly.

Egg -> Larva -> Pupa -> Adult **2 marks**

QUESTION 4

a. i. Differentce between primary and secondary consumer in the ecosystem.

Primary consumers are organisms that directly feed on producers (plants or autotrophic organisms) in an ecosystem. They are herbivores that consume plant material as their primary food source. Examples include grasshoppers, rabbits, and deer.

On the other hand, secondary consumers are organisms that feed on primary consumers. They are carnivores or omnivores, which means they primarily eat other animals. Examples of secondary consumers include snakes, wolves, and humans.

1.5 marks ecah = 3 marks

ii. **Explanation of the function of decomposers.**

The primary function of decomposers is to recycle nutrients back into the ecosystem. When they break down organic matter, they release essential nutrients like carbon, nitrogen, phosphorus, and other minerals back into the soil. These nutrients can then be taken up by plants, starting the cycle again and supporting the growth of new organisms.

2 marks

b. i. **<u>Difference between atomic number and mass number of elements.</u>**

Atomic Number:
The atomic number of an element represents the number of protons in the nucleus of its atoms. It uniquely identifies each element and determines its chemical properties. In a neutral atom, the atomic number also equals the number of electrons surrounding the nucleus, as the positive charge of the protons is balanced by the negative charge of the electrons. The atomic number is denoted by the letter "Z" and is usually found above the element's symbol in the periodic table.
Mass Number:
The mass number of an element is the total number of protons and neutrons present in the nucleus of one of its atoms. It is represented by the letter "A." Since protons and neutrons have nearly the same mass, the mass number can be thought of as the total number of nucleons (protons and neutrons) in the nucleus.

1.5 mark each = 3 marks

ii. <u>Characteristics of homogeneous mixtures.</u>

* Homogeneous mixtures have a consistent and uniform composition throughout.

* Since the components are uniformly distributed, homogeneous mixtures appear transparent or clear, allowing light to pass through without scattering.

* There are no distinct boundaries or phases between the different components in a homogeneous mixture. It appears as a single phase due to the even distribution of particles.

* The particles of the components in a homogeneous mixture are well-mixed and do not settle down over time, even when left undisturbed.

* Homogeneous mixtures are stable. Once prepared, these mixtures remain stable and do not separate into individual components. The intermolecular forces between the particles keep them evenly distributed.

1 mark each × any 2 = 2 marks

c. <u>How plaques are formed on the teeth.</u>

Plaques are formed on teeth when bacteria in the mouth combine with food particles, leading to a sticky film that sticks to the teeth and causes decay.

2 marks

d. **<u>Properties of the planet Neptune.</u>**

* Neptune is the eighth and farthest known planet from the sun in our solar system.
* It is the fourth-largest planet by diameter and the third-largest by mass among the planets
* Neptune is an ice giant, primarily composed of hydrogen, helium, and traces of methane, which gives it its blue colour.
* Neptune has 14 known moons

1 mark each × any 3 = 3 marks

QUESTION 5

a. **i. Difference between mixed farming and mixed cropping.**

Mixed Farming:

Mixed farming refers to a type of agricultural system where different crops and livestock are cultivated and raised on the same farm. This approach involves integrating crop production and animal husbandry.

Mixed Cropping:

Mixed cropping, on the other hand, is a specific planting technique where two or more crop species are grown together in the same field simultaneously.

1.5 mark each = 3 marks

ii. **Disadvantages of shifting cultivation.**

* Shifting cultivation can lead to deforestation, soil erosion, and loss of biodiversity, as it involves clearing land for cultivation and then moving on to a new plot once the soil fertility declines.

* Continuous shifting of cultivation sites can lead to soil exhaustion and reduced agricultural productivity over time, making it difficult to maintain a stable food supply for growing populations.

* The clearing of land and destruction of natural habitats for shifting cultivation can reduce the ecosystem services provided by forests, such as water regulation, carbon sequestration, and soil conservation.

* Shifting cultivation can make communities more vulnerable to the impacts of climate change, as it may become challenging to predict suitable periods for cultivation due to changing weather patterns.

1 mark each × any 2 = 2 marks

b. **i. Energy transformation for playing a guitar**

Chemical energy -> Kinetic energy -> Sound energy **1 mark**

ii. **Energy transformation for rubbing your palms together**

Chemical energy -> Kinetic energy -> Heat energy **1 mark**

c. i. **State the two conditions on which Newton's 1st law of motion is dependent.**

* Objects at rest: When an object is at rest, velocity (v= 0) and acceleration (a = 0) are zero. Therefore, object continues to be at rest.

1 mark

* Objects in motion: When an object is in motion, velocity is not equal to zero while acceleration is equal to zero (a = 0). Therefore, object will continue to be in motion with constant velocity and in the same direction.

1 mark

ii. Incineration as a way of managing waste.

Incineration is a waste management process that involves the controlled burning of solid waste materials at high temperatures. This method is used to reduce the volume of waste and generate energy in the form of heat or electricity.

2 marks

iii. **Properties of suspension.**

* Suspension is a heterogeneous mixture
* Suspension particles are larger than in solutions
* Suspension particles can be separated by filtration
* Particles can settle over time
* Particles scatter light, causing it to appear opaque or cloudy.

1 mark each × any 2 = 2 marks

d. **What is an eukaryote cell?**

An eukaryotic cell is a type of cell that possesses a defined nucleus enclosed by a membrane, along with other membrane-bound organelles such as mitochondria, endoplasmic reticulum, and Golgi apparatus.

2 marks

QUESTION 6

(a) (i) Examples of immiscible liquids;

* Water and kerosene
* Oil and water
* Water and benzene
* Water and carbon tetrachloride
* Ethanol and olive oil
* Acetone and vegetable oil. **1 mark each × any 2 = 2 marks**

Examples of miscible liquids;

* Water and alcohol
* Oil and alcohol
* Water and vinegar
* Methanol and acetone
* Ethanol and acetone **1 mark each × any 2 = 2 marks**

(ii) Name one apparatus in the separation of two immiscible liquids.

Separating funnel **1 mark**

(b) (i) What are seedbeds?

A seedbed is any piece of tilled land onto which crops are planted.

OR

Seedbed refers to the specific area or bed of soil that has been prepared and optimized for sowing seeds or planting seedlings. **1 mark**

(ii) State three main types of seedbeds.

* Raised bed
* Sunken bed
* Flat bed **1 mark each = 3 marks**

(c) (i) What is energy conservation?

Energy conservation is a process of reducing or eliminating wasteful uses of energy and resources OR Energy conservation is the judicious and wise use of our sources of energy without wasting them.

1 mark

(ii) State two ways of conserving energy.

* Ironing cloth in bulk
* Using energy saving lamps.
* Switching off electrical appliances when not in use
* Closing all windows and doors when using air- conditioner
* Avoid using faulty electrical appliances

1 mark each × any 2 = 2 marks

(d) **What is the 3R principle in sustainable waste management?**

* Reduce
* Reuse
* Recycle **1 mark each = 3 marks**

OBJECTIVES

1. C	**6. C**	**11. B**	**16. B**	**21. B**	**26. C**	**31. A**	**36. C**
2. A	**7. D**	**12. B**	**17. C**	**22. B**	**27. D**	**32. B**	**37. C**
3. C	**8. A**	**13. B**	**18. B**	**23. B**	**28. C**	**33. B**	**38. D**
4. C	**9. C**	**14. C**	**19. B**	**24. B**	**29. D**	**34. A**	**39. C**
5. A	**10. C**	**15. B**	**20. C**	**25. D**	**30. A**	**35. C**	**40. B**