PRIMARY TEACHERS MOCK EXAMINATION
SCIENCE MARKING SCHEME

SECTION A: (60 MARKS)

1. **Complete the following lesson plan for standard six by filling in the blank spaces**.

Topic: Reproduction in plants

a) **Subtopic**

Parts of a flower **(1 mark)**

b) Knowledge objective

- By the end of the lesson the learner should be able to name the parts of a flower

(1 x 2 = 2 marks)

c) **Learning resources**

i) **Flowers**

ii) Scapel / Razor blade

iii) Hand lens

(2 x ½ = 1 mark)

d) **Lesson presentation**

Introduction

Teachers activities	**Learners activities**
Teacher displays materials for activity and gives instructions	Learners identify / observe materials and take instructions
Development	Learners observe internal parts of a flower
Guide learners to observe internal parts of a flower	Learners discuss parts of a flower
Guide learners to discuss the parts of a flower	

e) Development

i) Guides learners to observe external parts of a flower	i) Observe external parts of a flower
ii)	
iii) Guide learners to draw and label parts of a flower	Learners draw and label parts of a flower
iv)	
conclusion - Review main parts of a flower	note main parts of a flower

2. **During a science lesson on HIV and AIDS, a standard VI learner asked the teacher the importance of testing for HIV and AIDS.**

a) **Name one scientific attitude this learner had developed**

- Curiosity **(Any 1 x 1 = 1 mark)**

b) **Reasons why testing for HIV and AIDS is important**

- To stay without fear and reduce anxiety.
- If infected, seek medical intervention.
- Knowing status helps one to protect yourself and sexual partners.
- If infected, helps one to protect themselves from infection.
- If diagnosed early, it gives one a better chance to a long and healthy life.
- If infected, one can get counseled.
- To help one plan for future

(Any 4 x 1 = 4 marks)

c) **Reasons why it is sometimes necessary for the teacher to redirect questions asked by learners in class back to them**.

- Enhance learners participation
- To develop learners communication skills.
- To find out how much learners know
- To help learners to better understand question asked.
- To increase the learners understanding
- To help learners to actively think.

(Any 3 x 1 = 3 marks)

d) **The teacher divided the class into groups to discuss the importance of testing for HIV**

i) **Precaution the teacher should give to the learners before the discussion**

- To avoid personalizing the discussion (OWTTE)

(1 mark)

ii) Other suitable practical method of teaching this content

- Role play / dramatization

(1 mark)

e) **Care and support measures that should be offered to persons living with HIV and AIDS**.

- Prompt medical attention or treatment
- Access to antiretroviral therapy
- Adequate and balanced diet to boost their immune system
- Love and care
- Good hygiene because their immunity is low.

(Any 2 x 1 = 2 marks)

3. Standard seven pupils wanted to find out which materials conduct electricity. The following materials were available for the investigation.
Torch cells, bulbs, pieces of copper wire, pieces of aluminum, plastic paper, glass wood and rubber.

a) Draw and label a set up which can be used to check whether the materials conduct electricity.

b) **Instructions that the teacher would give to the pupils to enable them carry out the**

investigation using the set up.

- Connect cells, bulb and copper wire and leave a gap
- Close the gap to complete the circuit using the various materials given, one at a time.
- Observe whether the bulb lights or not

(3 x 1 = 3 marks)

c) **Skills which the learners would develop as they carry out the investigation.**

- Observation
- Manipulation
- Classification
- Drawing and labeling / recording

(Any 2 x 1 = 2 marks)

d) **Reason why it may be necessary to conduct this investigation in groups**

Due to the cost of bulbs, cells and wires / limited number of materials

(1 x 1 = 1 mark)

e) **State the energy transformations in the investigation**

Chemical energy $\xrightarrow[\text{By chemical reaction}]{\text{converted}}$ Electric energy

conversion

$\longrightarrow$ Heat energy

In bulb filament + Light energy

(4 x ½ = 2 marks)

4. **An investigation was carried out by a group of learners to determine the effect of the length of the string on the period of the swing of a pendulum.**

a) **Formulate the problem that the learners will be answering by doing this investigation**

- Does the length of the string affect the period of the swing of a pendulum? **(1 mark)**

b) **For the problem in 4 (a) above, suggest a hypothesis**

- The length of the string does not affect the period of the swing of a pendulum

  Or
- The length of the string affects the period of the swing of a pendulum

(1 mark)

(Deny mark for giving both hypothesis)

c) **Variables that need to be controlled in this investigation**

- Angle of release of pendulum
- Diameter of string
- Size of bob

(Any 2 x 1 = 2 marks)

d) **State the appropriate method that the learners would use to record the results of their investigation**

- Tabulation **(1 mark)**

e) **Other methods of recording information in science**

- Drawing diagrams
- Mounting
- Modeling
- Graphs
- Printing
- Taking photographs
- Tape / video recording

(Any 2 x 1 = 2 marks)

f) **Reasons why it is important to record observations in science**

- For future references
- To communicate information
- To draw conclusions after analysis
- Help one to make predictions

(Any 3 x 1 = 3 marks)

5. a) The diagram below represents a set up that was used to demonstrate a certain property of Matter

Key _ C

Ability tested __ Application **(2 marks)**

b) **Explain why a table of specification is important in developing a test**

- It enables the test developer to balance the test in terms of syllabus content and mental abilities.

(3 marks)

NB: Award full marks if 'balance' is implied

c) **Explain the meaning of the following terms as used in test development**

i) **Objectivity**

- The judging of a successful performance of learners should not be a matter of option

(1 mark)

ii) **Differentiality**

- Test should distinguish naïve learner form those who have achieved objective / has questions only learners who have achieved objectives can answer (OWTTE)

(1 mark)

d) **Reasons why continuous assessment in science is important to the learner**

- For learners to be aware of their strengths and weaknesses.
- To motivate learning
- To develop self confidence

(Any 2 x 1 = 2 marks)

6. a) A science teacher decided to engage his learners in an experiment to investigate whether water is necessary for germination.

i) **Roles of the teacher during the experiment**

- Ensuring all necessary resources / materials are available
- Giving instructions / procedure on how experiment is conducted
- Supervise learners as they do experiment.
- Answering learners questions
- Guide learners on how to record results
- Assess the learners

(Any 4 x 1 = 4 marks)

ii) **Advantages of using the experimentation method**

- Knowledge gained is retained for long
- Learners develop many scientific skills and attitudes
- Adds realism in learning
- Encourages independent learning
- A lot of concepts can be covered at once.
- Gives learners ability to collect and analyze date.

(Any 3 x 1 = 3 marks)

b) **Reasons for using different methods when teaching science**

- To suit different topics in the syllabus
- To make use of a variety of senses.
- To make use of a situation within reach.
- To reach a variety of learners in a class with different abilities.
- Avoid boredom / motivate learners.

(Any 2 x 1 = 2 marks)

SECTION B: (40 MARKS)

7. An experiment was carried out to test the effect of carbon (iv) oxide concentration on the rate of photosynthesis. The results are given in the table below:

a) On the grid provided plot a graph of rate of photosynthesis against carbon (iv) oxide (CO_2) concentration.
- Scale ¾ page (1 mark)
- Labeling axis (1 mark)
- Plotting all points correctly (1 mark)
- Smooth curve (1 mark)

b) **Account for the shape of the graph when the concentration of carbon dioxide was between:**

i) **0 and 0.05**
- Rate of photosynthesis is increasing with increasing concentration of CO_2; other factors are at the optimum levels.

(1 x 2 = 2 marks)

ii) **0.06 and 0.08**
- Rate of photosynthesis remains constant with increase in CO2.
- Other factors have become limiting factors

(1 x 2 = 2 marks)

8. a) **How a single Moving pulley makes work easier.**
The effort acts on the load from two points. Hence the effort applied equals half the load.

(2 marks)

b) The velocity ratio of the wheel and axle machine.

$$\text{Velocity Ratio} = \frac{\text{Radius of wheel}}{\text{Radius of axle}}$$

$$= \frac{R}{r}$$

$$= \frac{10\ cm}{1.25cm}$$

$$= 8$$

9. a) **Name the gases represented by the letters:**
P Carbon dioxide

Q Oxygen

R Nitrogen (3 marks)

b) **Which component of air would have a drastic effect on temperature if its volume was increased significantly.**
Carbon dioxide **(1 mark)**

10. a) **How the se-up works**
In the presence of heat; the bimetallic strip expands unevenly and bends to complete the circuit. Current flows in the solenoid and the resulting electromagnet attracts the soft iron armature which pulls the hammer towards the gong sounding the alarm (bell).
(4 marks)

11. a) **Chemical properties of an acid**
- Acids reacts with metals to form a salt and Hydrogen gas.
- Acids react with bases to form a salt and water
- Acids react with carbonates and hydrogen carbonates to produce salt, CO_2 and water

(Any 2 x 1 = 2 marks)

b) **Why melting of candle wax is a physical change**.
The melting process is reversible i.e can form back a candle
(1 mark)

12. a) **Distinguish between the terms genes and chromosomes**
Genes are hereditary factors or traits which contain hereditary information while chromosomes are hereditary material on which genes are located
(1 mark)

b) i) **Name the part labeled X**
Iris (reject irish) **(1 mark)**

ii) **Name and describe the function of the part labeled Y**
Name: Lense

Description: Focuses light on the retina **(1 mark)**

13. a) **How the set up is used to remove hardness of water**
Water containing calcium ions (Ca^{2+}) passes into the permutit containing sodium ions (Na^{+}), which being more reactive than Calcium takes the position of Calcium in water and calcium takes position of Na in permutit thus the water coming out lacks calcium ions and its soft.
(2 marks)

b) **Disadvantages of hard water**

- Takes too long to lather thus wastes a lot of soap.
- Form scum on water / stains clothes
- Forms scales on boilers which leads to wastage of fuel.

(Any 2 x 1 = 2 marks)

14. a) Name the instrument and aspect of weather it measures

Name: Rain Gauge **(1 mark)**

Aspect of weather: Rainfall **(1 mark)**

b) **Why the instrument is sunk into the ground and the top of funnel left 30cm above the ground level.**

To prevent splashes of water and surface run – off from getting into the rain gauge

(2 marks)

15. **One way in which each of the following is adapted to its habitat**

a) **Cactus**

- Stems and side branches are modified for water storage
- Have thorns to discourage herbivores from feeding on item

(Any 1 x 1 = 1 mark)

b) **Water lily**

- Leaves float on water for gaseous exchange
- No cuticle, to allow water loose
- Stomata on upper leaf surface

(Any 1 x 1 = 1 mark)

c) **Camel**

- Long legs to lift it off the hot sand
- Cells resistant to desiccation
- Hooves that allow walking on sand without sinking

(Any 1 x 1 = 1 mark)

d) **Fish**

- Stream lined body to reduce resistance to movement
- Fins for movement
- Gills for gaseous exchange

(Any 1 x 1 = 1 mark)