

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of two sections A and B.
3. Answer ALL questions in the spaces provided, **in English.**
4. **Diagrams MUST be drawn in pencil**

FOR OFFICIAL USE ONLY:

SECTION	QUESTION	MAXIMUM SCORE	SCORE
A	1 -6	60	
B	7	8	
	8	8	
	9	11	
	10	7	
	11	6	

SECTION A (60 Marks)

Answer **ALL** questions in the spaces provided.

1. A standard VII science teacher and his pupils wanted to investigate the solubility of different substances in water, using the following materials: plastic bottles, knife, water, sugar, salt, Potassium permanganate, thin sticks.

a) Identify other two materials the teacher needs to provide for this investigation. *Measuring cylinder, Tea spoon.* (2 marks)

b) What is the purpose of the knife and thin sticks in this investigation?

Knife: *Cutting the bottles to make beakers.* (1 mark)

Sticks: *Stirring the solids* (1 mark)

c) Give three variables that need to be controlled in this investigation.

Amount of liquid, Amount of solid, Temperature. (3 marks)

d) State three reasons why practical method is suitable for conducting this lesson. *Materials are locally available/not expensive; Procedure is simple/not complicated; Experiment is safe/not dangerous.* (3 marks)

2. Class I science teacher planned to teach the topic Weather, sub – topic “Weather Changes” using Science walk method.

a) Write one skill objective for the lesson.

By the end of the lesson the learner should be able to observe weather changes; Accept: record. (2marks)

b) Give four activities the teacher could ask the learners to do during the walk.

Observe different weather conditions; Record different weather conditions using appropriate symbols; Demonstrate how to dress in different weather conditions; State appropriate farming activities done during different weather conditions. (4 marks)

(c) State two follow up activities the teacher would ask the learners to do after the science walk. *Observe weather conditions for each day for one week;*

Complete weather chart for a week using appropriate symbols. Prepare a weather chart. (2 marks)

d) Write a suitable BB Summary that the teacher could develop for the lesson.

Class I	Science		Date
	Weather Changes:		
	Weather condition	Symbol	
	Rainy		
	Cloudy		
	Windy		
	Calm		

Award the two marks provided the weather conditions are mentions even without the correct symbols. (2 marks)

3. A standard V teacher planned to teach the content: States of Matter using dynamic approach.

(a) State two characteristics of dynamic approach.

It is learner centered/learners are involved actively; It looks at science as an activity involving experiments; ~~Reject:~~ What is learnt is retained for long, It is interesting / motivating to learners, since they are advantages but not characteristics (2 marks)

(b) Using the guideline given below, describe how the teacher would use dynamic approach to lead pupils to conclude that there are three states of matter namely solid, liquid and gas.

(i) Materials: Ice, Tin and Source of heat/Stove/Spirit lamp. *Rj. Candle.* (1 mrk)

(ii) Procedure:

1. Place the piece of ice in the tin and heat it mildly.
2. Observe and record the change of state that takes place.
3. Heat the liquid water in the ti strongly until it boils/evaporates.
- 4 . Observe and record the change of state that takes place. (4marks)

c) Write one question the teacher would ask learners at the introduction of the lesson to develop the skill of prediction.

How many states does water exist in? Accept any question to the effect that water exists in many different states and the question MUST end in a question mark (1 mark)

4. A science teacher prepared a scheme of work for standard four. One of the topics in the scheme of work was "Types of crops". Materials included in the resource column were maize, kale, mango, beans, sunflower, sisal and tea.

a) State three reasons why it was necessary for the teacher to prepare a scheme of work.....

*It helps a teacher to acquire/collect teaching aids in advance;
It is used for writing a lesson plan; It enables the teacher to teach the topics in an organized/systematic manner; It is a useful record for reference when handing over classes to new teachers; It is a professional document required of all teachers for administrative purposes; It helps to harmonize the syllabus coverage in a large school where different teachers handle same subject in different streams; It ensures that all topics in the syllabus are covered and given ample time; Any three.* (3 marks)

b) State two factors the teacher had to consider when preparing the scheme of work. *Ability of the learners; Availability of the teaching aids; Syllabus content; Time allocation in the timetable; Availability of reference materials;* (2 marks)

c) In the table below, write three teaching activities and their corresponding learning activities that the teacher could include in the scheme of work.

Teaching activity	Learning activity
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i) Display the different types of crops	-Observe the crops displayed.
ii) Ask learners to name and mention uses of the different types of crops displayed.	-Name and mention the uses of different crops.
iii) Ask learners to classify the crops according to their uses.	-Classify the crops according to their uses.

This lesson is on types of crops (food and cash crops) so accept any reasonable activities leading learners to group them as such. **Reject:** taking notes, explanation, oral questions. **(3marks)**

d) Give two reasons why objectives are stated in a scheme of work.

To help the teacher choose appropriate teaching/learning activities; To enable the teacher assess learners at the end of the lesson/To evaluate learning; To choose appropriate teaching method; **(2 marks)**

e) Write a remark the teacher could have indicated in the remarks column of the scheme of work. The lesson was successful because learners were able to group the crops as cash and food crops correctly. Accept any well written remarks stating the reason why the lesson was successful or not. **(2 marks)**

5. A standard VI science teacher intended to invite a guest speaker to teach a lesson on importance of HIV testing.

a) State the information the teacher would give the guest speaker to help in making preparation.

Date, time and venue for the lesson; Number of learners; What the learners already know about the topic HIV and AIDS; Objectives of the lesson. Any two. **(2marks)**

b) State four reasons the guest speaker would give the learners as to why testing for HIV is important.

To avoid infection if found positive; To live positively if found positive; Get medical care/counseling/social support if found positive; To plan their lives e.g. marriage; Take proper nutritional care if positive. **(4 marks)**

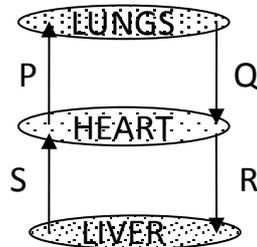
c) Give two preparations the teacher would ask the learners to make before the lesson. Read about the topic in advance/do library research; Prepare questions to ask the guest/make a questionnaire;

(2 marks)

d) State two reasons why it is sometimes necessary for a teacher to invite a guest speaker. *For expert information; For stimulus variation/break monotony;* (2 mark)

6. The following question was set in a KCPE Science paper:

a) The diagram below represents a simplified blood circulatory system.



Which pair of blood vessels carries oxygenated blood?

- A Q and R
- B P and S
- C Q and S
- D P and R

(i) What is the key? *A or Q and R* (1 mark)

(ii) State the mental ability being tested. *Analysis.* (1 mark)

b) Give two advantages of objective tests.

They are easy to mark accurately; They are not affected by human bias; They cover large content area; They pose no challenge to learners with language difficulties. Accept any two. (2 marks)

c) State two qualities of a good multiple choice item.

The stem must be clear; with only one possible answer; The distracters and the key must come from same content area; and must be of same length in terms of words; (2 marks)

d) State two reasons why a table of test specification is important when setting an exam paper. *It helps the teacher to come up with a balanced paper in terms of mental abilities to be tested; It also ensures that all the topics covered are tested equally; It eliminates over-setting of some topics.* (2 marks)

e) Give two reasons for using a marking scheme when scoring an examination paper. *To include all possible responses for each question; To be fair in awarding marks; To mark accurately;* (2 marks)

SECTION B (40 Marks)

Answer ALL questions in this section in the spaces provided.

7. A Standard six class carried out a practical activity to investigate how temperature affects the hatching of eggs by artificial hatcheries. They used 9 similar hatcheries, and placed 100 eggs in each hatchery. Then they placed each of the hatcheries at different temperatures but at same conditions of air and moisture. Percentage of eggs that hatched was recorded in the table below:

Temperature °C	0	5	10	15	20	25	30	35	40
% Eggs Hatched	0	2	5	8	16	50	84	30	2

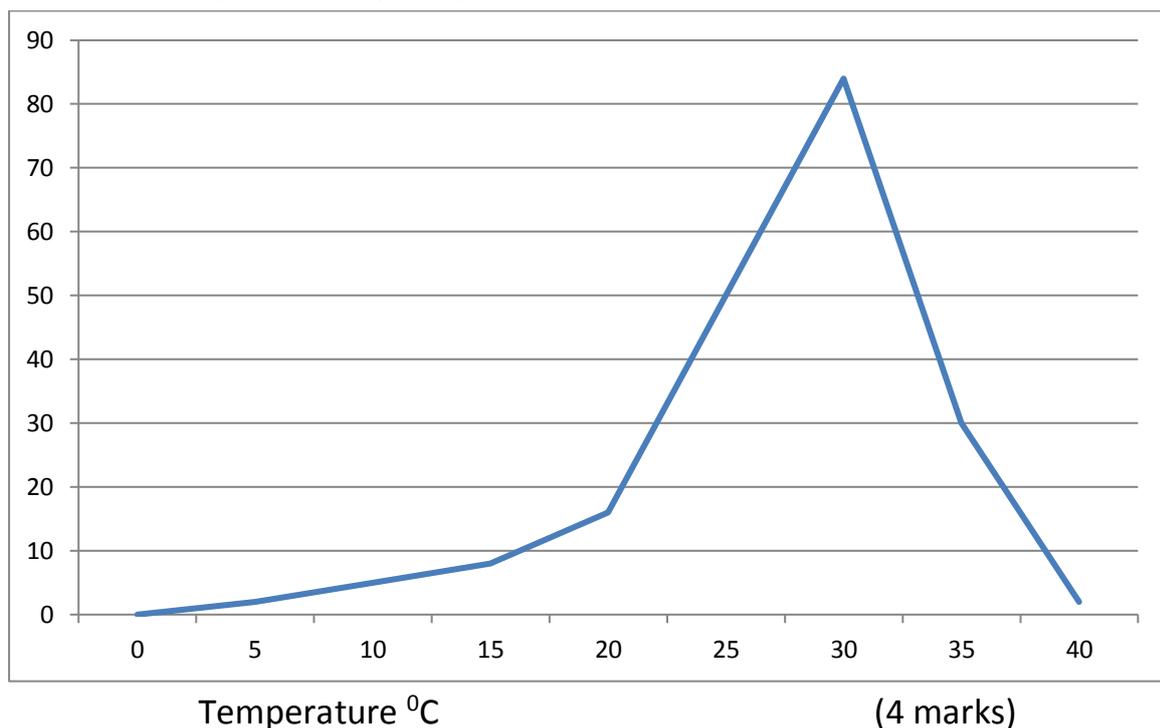
a) On the grid provided draw a graph of percentage of egg hatched against temperature.

Labeling axes = 1 mark

Plotting all points correctly = 1 mark

Smooth curve = 1 mark

Scale covering over 1/2 of the grid = 1 mark



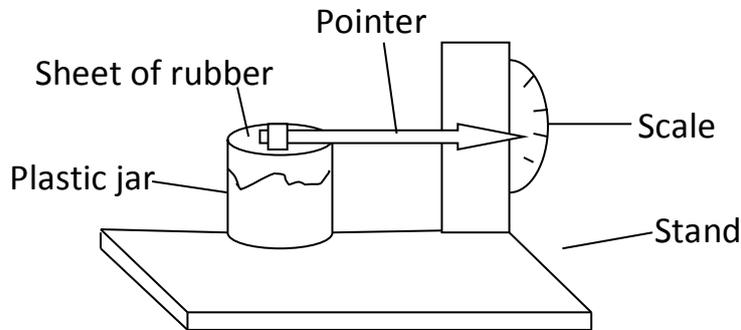
b) Determine the rate of decrease in percentage of eggs hatched between 30°C and 40°C. Rate of decrease = $\frac{\text{No. eggs at } 40^{\circ}\text{C} - \text{No. Eggs at } 30^{\circ}\text{C}}{40^{\circ}\text{C} - 30^{\circ}\text{C}} = \frac{2-84}{10}$

$$= -8 \text{ eggs} / ^{\circ}\text{C} \quad (2 \text{ marks})$$

c) Describe the shape of the graph from 15°C to 30°C.

There is sharp increase of the number of eggs hatched as temperature increases. (2 marks)

8. The following diagram represents an instrument used to measure an aspect of weather.



a) Name the instrument. *Barometer/Improved barometer* (1 mark)

b) State the aspect of weather that it measures. *Air pressure* (1 mark)

c) Explain how the instrument works.

When air pressure is high, the elastic rubber is pressed downwards; the pointer moves upward and a high level is recorded on the scale;

When air pressure is low, the air inside the plastic jar pushes elastic rubber upwards; the pointer moves downwards and a low value is recorded on the scale;

(2 marks)

9. a) Explain how mulching helps to conserve soil.

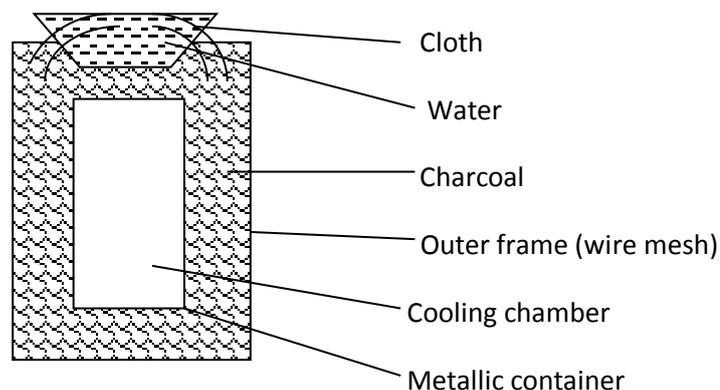
It improves fertility by adding humus; and it also reduces evaporation/conserves moisture; and also prevents sheet erosion; Any two. (2)

(b) Explain why individuals of blood group AB are called universal recipients.

They have no antibodies hence accept any blood and no agglutination occurs.

(2 marks)

10. The diagram below represents an improvised charcoal cooler.

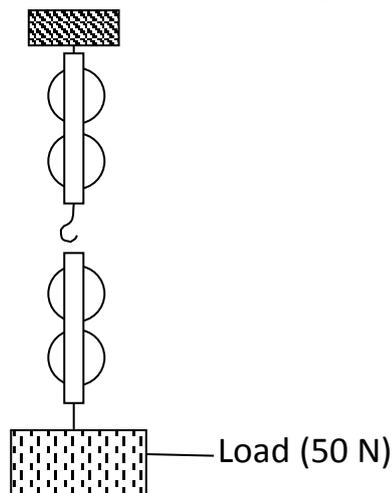


Explain how the cooler works.

When temperature is high; charcoal absorbs water from the basin through the cloth and becomes wet; water evaporates from the charcoal walls; causing a cooling effect on the cooling chamber;

(4 marks)

11. The diagram below represents an arrangement of pulleys.



a) Indicate on the diagram how a string should be tied on the system for it to lift the load when effort is applied. (2 marks)

b) Calculate the mechanical advantage of the pulley system if an effort of 12.5 N was used to lift the load.

$$M.A = \text{Load}/\text{Effort}; = 50/12.5 = 4. \quad (2 \text{ marks})$$

12. a) Distinguish between temporary and permanent hardness of water.

Temporary hardness can be removed by boiling but permanent hardness cannot; *OR* Temporary hardness is caused by aluminium sulphate ions while permanent is caused by calcium sulphate ions. (2 marks)

b) State two ways in which plants depend on animals for food.

They use animal waste for nutrients in the soil; They get carbon dioxide from animals for photosynthesis. (2 marks)

13. a) State two reasons why meat should be cooked properly before eating.

To improve taste; To make it soft hence assist in digestion; To kill germs; Accept any two. (2 marks)

b) Give two groups of people with special nutritional needs.

Expectant mothers; Lactating mothers; Infants; Young children; Old people; Sick people/Invalids; (2 marks)

14. a) Distinguish between green and non-green plants.

Green plants have chlorophyll but non-green do not have chlorophyll; *OR* Green plants manufacture their own food by photosynthesis but non green plants don't/depend on other plants for food; Accept correct explanation even if the word photosynthesis is not used. (2 marks)

b) In the space provided below draw and label a monocot seed and a dicot seed and label the parts.

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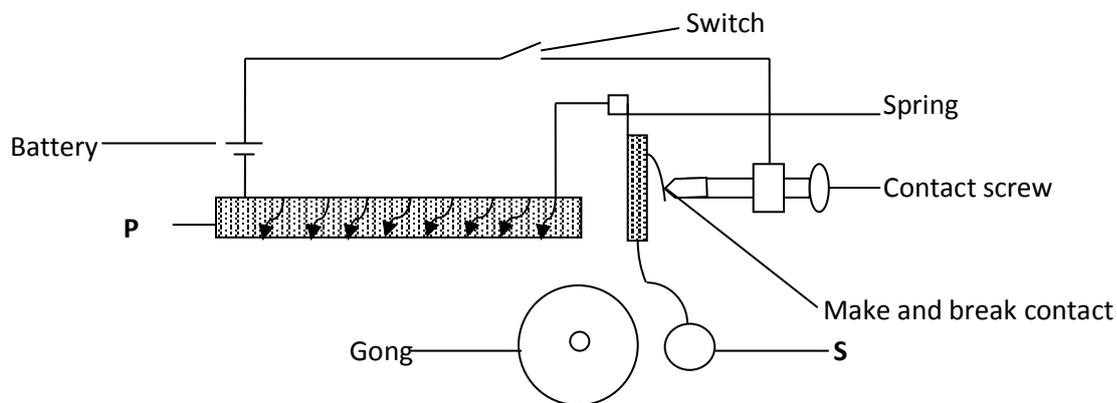
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..... (2 marks)

15. The diagram below represents an electric bell.



a) Name the parts labeled P and S.

P . *Soft iron amateur. OR Electromagnet.* (1 mark)

S. *Hammer.* (1 mark)

b)When the switch is closed, the bell rings. State the correct order of energy transformations that take place for the bell to ring.

Chemical - Electrical - Magnetic - Sound. (2 marks)

END