

231/3
BIOLOGY
PAPER 3
(PRACTICAL)
TIME: 1¼ HRS
JULY / AUGUST 2014

MBOONI WEST JOINT EVALUATION TEST, 2014

Kenya Certificate of Secondary Education

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INSTRUCTIONS TO SCHOOLS

The information contained in this paper is to enable the head of the school and the teacher in charge of biology to make adequate preparations for this year's mock biology practical examination. NO ONE ELSE should have access to this paper or acquire knowledge of its contents. Great care should be taken to ensure that the information contained herein DOES NOT reach the candidates either directly or indirectly. The teacher in charge of biology should NOT perform any of the experiment in the same room as the candidates nor make the results of the experiment available to the candidates or give other information related to the experiment to the candidates.

CONFIDENTIAL REQUIREMENTS

Each candidate will require the following.

- 5 – Potato cylinders measuring 5cm long and a half (½ cm /0.5 cm) wide.
- Concentrated salt solution in a beaker labeled S₂
- Distilled water in a beaker labeled S₁
- 10 ml of hydrogen peroxide in a beaker
- Dilute hydrochloric acid in a beaker
- 3 – test tubes labeled A,B and C.
- A pair of forceps.
- A ruler graduated in centimeters (cm)
- A test tube rack
- Filter paper. (2)

NAME DATE

INDEX NO. SIGNATURE

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INSTRUCTIONS TO CANDIDATES

- Answer **all** the questions.
- You are required to spend the first 15 minutes of the 1¾ hours allowed for the paper reading the whole paper carefully before commencing your work.
- Answers must be written in the spaces provided in the question paper.
- Additional pages must not be inserted.
- This paper consists of 4 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

FOR EXAMINER'S USE ONLY

Questions	Maximum score	Candidate's score
Question 1	16	
Question 2	12	
Question 3	12	
Total score	40	

1. You are provided five with potato cylinders each measuring 5cm long, liquid S₁ and S₂, Hydrogen Peroxide, dilute Hydrochloric Acid, and test tubes labeled A,B and C.
- a) i) Place one cylinder in a beaker containing liquid labeled S₁ and another in the liquid labeled S₂. Allow to stand for 30 minutes, then remove the cylinders, wipe them dry using blotting paper. Measure each cylinder in centimeters and record their length and texture in the table given below. (4 marks)

CYLINDER	LENGTH IN CM	TEXTURE
LIQUID S ₁		
LIQUID S ₂		

- ii) Account for the results obtained in a (i) above (4marks)

.....

.....

.....

.....

.....

- b) Using a scalpel cut one of the cylinders into 5 parts each one centimeter long. Put the pieces into test tube A. Crush the other two using mortar and pestle into a paste. Divide the paste into two equal lots. Put one lot into test tube B and the other into test tube C. To each of the test tubes A and B add 2cm³ of hydrogen peroxide and to test tube C add 1 cm³ of dilute Hydrochloric Acid, then 2cm³ of hydrogen peroxide. Record your observation below. (3marks)

Test tube A

.....

.....

Test tube B

.....

.....

Test tube C

.....

.....

- (ii) Write a word equation for the reaction that occurs in the test tubes (1mark)

.....

.....

.....

- (iii) Account for the rate of reaction in test tube A, B and C. (4 marks)

A

.....

.....

.....
B

.....
C

2. The diagrams below represents plants , K,L and M. study them carefully and answer the questions that follow.

SEE PHOTOGRAPHS ATTACHED

- a) Giving a reason in each case, classify each plant into its division. (4 marks)
K

.....
L

- b) Using observable features only, state the subdivision of plant M (2marks)

- c) Identify the parts labeled P,U,V & Y

P

U

V

Y

- d) State the functions of part T and state why (d) grows in wet areas. (2 marks)

3. You are provided with photograph L, K and J. Examine them.

SEE PHOTOGRAPHS ATTACHED

a) Using observable features only, state class of animals shown in the photograph L and K. (4 marks)

L

.....
Reason

.....
.....

K

.....
Reason

.....
.....

b) (i) On the photograph J name the parts labeled E, F and G. (3 marks)

E

.....
F

.....
G

(ii) State the functions of the structures labeled H in photograph J. (2marks)

.....
.....
.....

c) (i) The actual length of animal J in cm is shown by a section of the ruler in the photograph.

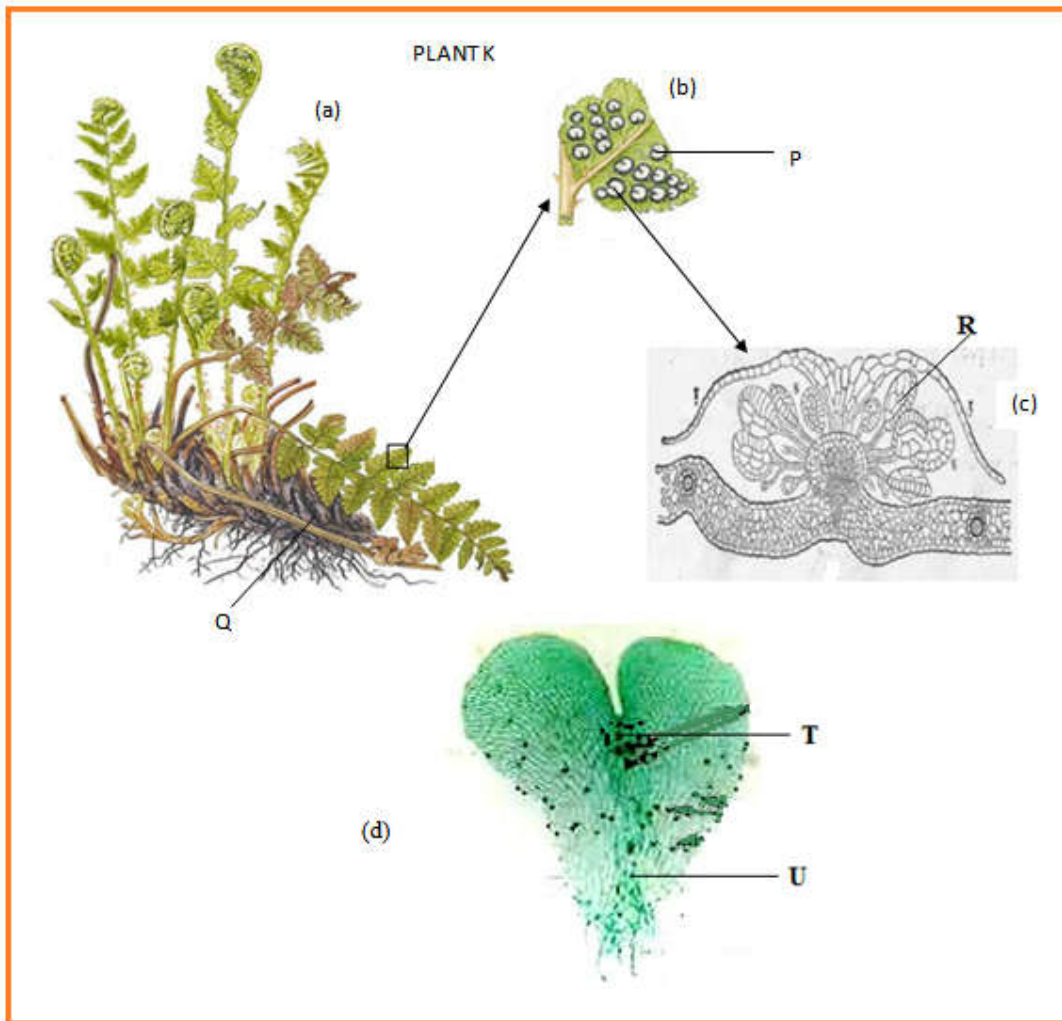
Calculate the tail power (show your working)

(ii) State the significance of tail power the life of fish in water. (1mark)

.....
.....
.....

MBOONI WEST SUB – COUNTY FORM FOUR JOINT EXAMINATION 2014
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QUESTION 2 PHOTOGRAPHS



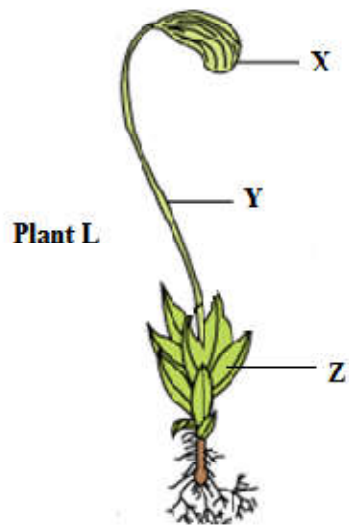
Plant M



(a)



(b)



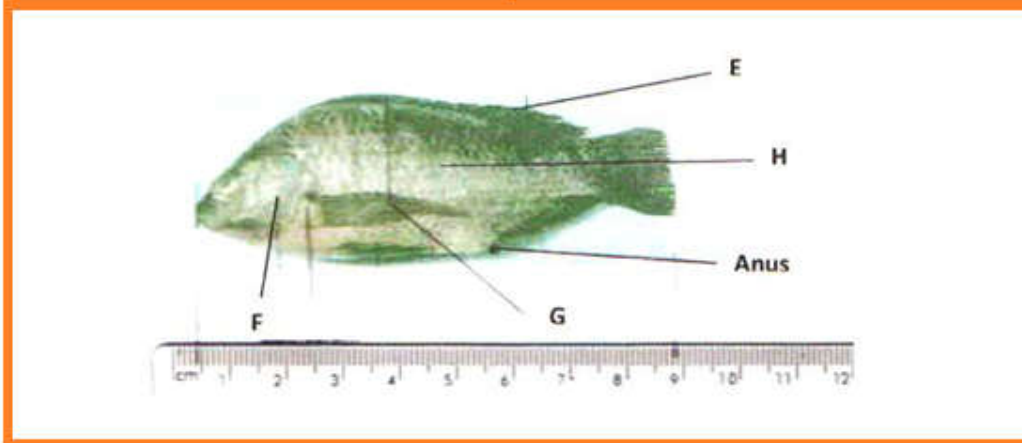
QUESTION 3 PHOTOGRAPHS



Photograph L



Photograph K



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 MARKING SCHEME

Cylinder	Length in cm	texture
Liquid s ₁	5.1-5.2	(very hard /stiff/firm
Liquid s ₂	4.9-4.8	Soft /flabby/flexible

- ii) S₁ has lower concentration /lower osmotic pressure /hypotonic /more dilute than the cell sap of potato cells; water enters the potato cell by osmosis making the cells turgid /increasing the size of cells;

S₂ has higher concentration / higher osmotic pressure /hypertonic than cell sap of potato cells; water is lost from the cell by osmosis making them flaccid /decreasing the size of cells. **(4marks)**

- b i) Test tube A ; less foam /bubbles /froth formed /slow effervescence /fizzing /frothing;
 Test tube B: more foam /bubbles /froth formed //rapid effervescence /fizzing /frothing;
 Test tube C: little /small bubbles formed; **3marks**

ii) Hydrogen Peroxide $\xrightarrow{\text{catalase}}$ water + oxygen

1mark

iii) **Test tube A**

The potato pieces provide a smaller surface area for enzyme action

Test tube B

The crushed potato cylinder provides a larger surface area for enzyme action

Test tube C

Dilute hydrochloric Acid alters /lowers the pH making it less favourable /suitable for enzyme catalase activity **(6marks)**

2. a) K - pteridophyta; rej wrong spelling

Reason - presence of sori
 - Leaf modified to a frond

L - Bryophyta

Reason - presence of capsules
 - Presence of seta
 - Presence of rhizoids

(4marks)

- b) Gymnospermatphyta; rej Gymnospermae

Reasons -presence of cones (male and female)
 -palm - like leaves

2marks

- c) P –sorus; rej sori

U- Archegonium; rej Archegonia

V-male cone; (s)

Y- Seta.

4marks

- d) T –produce male gametes; sperms /antherozoids

1mark

why D –grows in wet areas to provide moisture for antherozoids to swim to archegonia (to cause fertilisation)
1mark

3. a) L-Mammalia rej wrong spelling **1mark**

Reason; has fur

Has earlobes /pinnae Acc earlobe/pinna(any one correct)

K -Aves rej wrong spelling **1mark**

Reasons;
 - body covered by feathers
 - Has a beak
 - Has scaly hind legs /limbs

- Fore limbs modified into wings (any one correct) 1mark

- b. i) E-Dorsal fin
 F-Operculum
 G-Pectoral fin 3marks

-spelling must be correct

Answers must be on photograph to award

- ii) H/scales
 - Overlap backwards to reduce resistance to water during swimming
 - Prevent water from getting into the body

(2marks)

- c. i) Tail power = $\frac{\text{length of tail tip to anus}}{\text{Length from tail tip to mouth}} \times 100$
 $\frac{3.1\text{cm}}{8.4\text{cm}} \times 100 = 36.9\% = 37\%$

- ii) Large to provide enough force for forward thrust /propulsion;