

231/3
BIOLOGY
PAPER 3
PRACTICAL

MBOONI EAST SUB - COUNTY FORM FOUR JOINT EVALUATION TEST, 2014

Kenya Certificate of Secondary Education

231/3
BIOLOGY
PAPER 3
PRACTICAL
CONFIDENTIAL

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 biology practical examination.

NO ONE ELSE should have access to this paper or acquire knowledge of its contents. Great care **MUST** be taken to ensure that the information herein does not reach the candidates either directly or indirectly.

The teacher in charge of Biology should **NOT** perform any of the experiments in the same room as the candidates nor make the results of the experiments available to the candidates or give any other information related to the experiments to the candidates.

REQUIREMENTS

Each candidate will require the following:

- 5 test - tubes
- 5ml of solution L₁ – starch solution 0.5%
- 5ml of solution L₂ – diastase solution 10%
- 2ml of solution L₃ – Boiled diastase solution 10%

NB: boiled for 10 minutes

- Means of labeling – 3 labels
- Water bath
- Thermometer
- Iodine solution
- 3 Droppers
- A White tile
- Means of timing

NAME DATE

INDEX NO. SIGNATURE

231/3
BIOLOGY
PAPER 3
(PRACTICAL)
TIME: 1¾ HOURS.

MBOONI EAST SUB - COUNTY FORM 4 JOINT EVALUATION TEST, 2014

Kenya Certificate of Secondary Education

231/3
BIOLOGY
PAPER 3
(PRACTICAL)
JULY/AUGUST 2014
TIME: 1¾ HOURS.

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.
- Candidates may be penalized for recording irrelevant information and for incorrect spellings.
- This paper consists of 7 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	12	
Question 2	14	
Question 3	14	
Total score	40	

1. You are provided with solutions labeled L₁, L₂ and L₃. Note that L₃ is the same as L₂ except that L₃ has been boiled.

Label three test- tubes A, B and C.

Into the test- tube labeled A add 1ml of solution L₁.

Into the test- tube labeled B add 1ml of L₁ and 1ml of L₂.

Into the test- tube labeled C add 1ml of L₁ and 1ml of L₃.

- a) Withdraw a drop from test – tube A and place it on a white tile. To the drop add one drop of iodine solution. Record your observation in the table below. (3 marks)

Test - tube	observation	conclusion
A		
B		
C		

Repeat the procedure with contents in test – tubes B and C. Record your observations in the table. Place the three test –tubes labeled A, B and C into a water bath at 37⁰C.

NB. Ensure that the temperature of the water bath does not fall below 35⁰C or exceed 38⁰C

b) After 30 minutes, test the contents of each of the test – tubes labeled A, B and C following the procedure in (a) above. Record your observations in the table below. (3 marks)

Test - tube	observation	conclusion
A		
B		
C		

c) Why was test – tube labeled A included in the experiment?

.....

d) (i) suggest the identity of solution L₂ (1mark)

.....

(ii) Give a reason for your answer in (d) i above. (1 mark)

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

e) Suggest a part of the alimentary canal in the body of a mammal where the process being investigated in the experiment would take place. (1mark)

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

f) Account for the results at the end of the experiment in the test – tube labeled.

i) B (1mark)

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

ii) C (1mark)

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

2. The diagram below shows part of a mammalian skeleton. Study it and use it to answer the questions that follow.

SEE PHOTOGRAPH ATTACHED

(a) Name each of the parts of the skeleton marked H, J, K and N. (4 marks)

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

(b) Name each of the parts of the human skeleton described below.

(i) The part on which the anterior portion of N articulates. (1mark)

.....
.....

(ii) The three bones that together fuse to form bone M

.....
.....

(c) State any two adaptations of each of the following structures:

(i) Structure M

(2marks)

.....
.....

(ii) Structure L

(2marks)

(d) On the diagram label each of the following parts using the letters in brackets.

(i) The pubis symphysis (P)

(1 mark)

(ii) The part where intercostal muscle attach (I)

(1mark)

(iii) A joint that can turn through 180° only

(1mark)

3. You are provided with three sets of seedlings, labeled;

Set A₁

Set A₂

Set B

Examine them and use them to answer the questions that follow.

SEE PHOTOGRAPHS ATTACHED

(i) Name the phenomenon exhibited by seedlings in set A₂

(1mark)

.....
.....

(ii) Give a reason why plants exhibit the phenomenon named in (i) above.

(1 mark)

.....
.....

(iii) Name the response exhibited by the seedlings in set B

(1mark)

.....
.....

(iv) Explain how the response named in (iii) above occurred.

.....
.....

(v) State five differences between seedlings in set A₁ and A₂.

(5 marks)

Set A ₁	SetA ₂

(vi) State the conditions under which the seedlings in set A₁ and A₂ were grown.

Set A₁

.....

.....

.....

.....

Set A₂

.....

.....

.....

.....

MBOONI EAST SUB – COUNTYFORM FOUR JOINT EXAMINATION

231/3

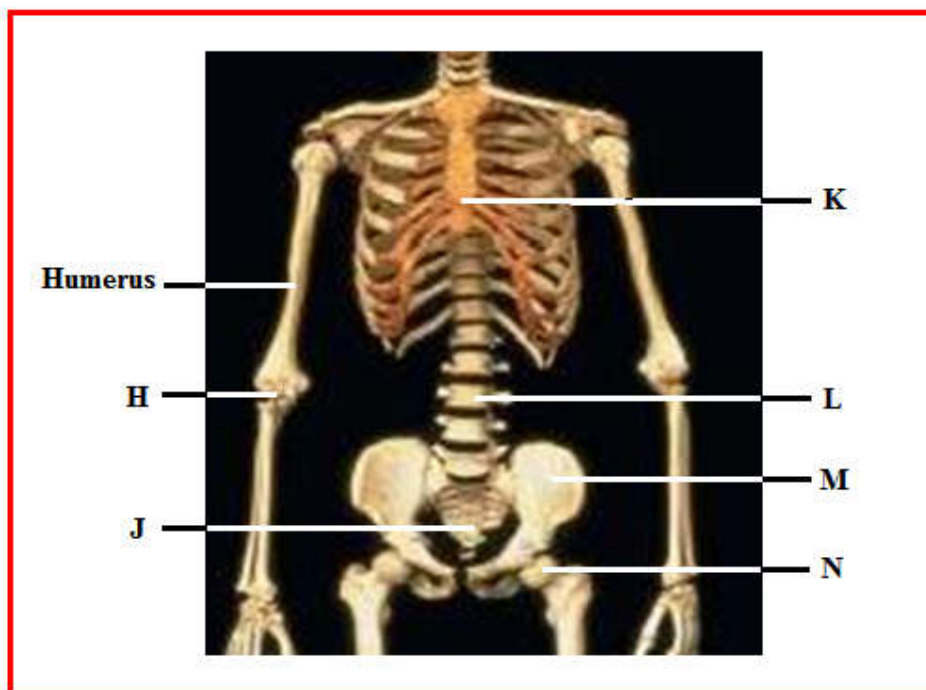
BIOLOGY

PAPER 3

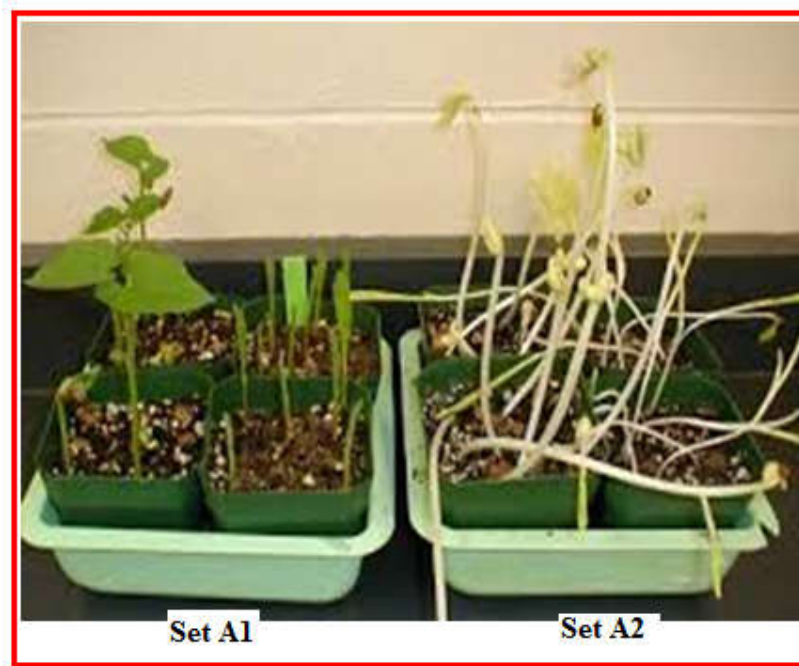
PRACTICAL

JULY/AUGUST 2014

QUESTION 2. PHOTOGRAPHS



QUESTION 3. PHOTOGRAPHS



MBOONI EAST SUB – COUNTY JOINT EXAM -2014

Biology paper 3

Practical

231/3

Marking schemes

1. (a)

Test - tube	OBSERVATIONS	CONCLUSION
A	Blue black/blue /black/bluish black;	Starch present;
B	Blue black/blue /black/bluish black;	Starch present;
C	Blue black/blue /black/bluish black;	Starch present;

6/2 = 3 marks

(b)

Test - tube	OBSERVATIONS	CONCLUSION
A	Blue black/blue /black/ dark blue / bluish black;	Starch present;
B	No colour change /brown/yellow colour / colour of iodine;	Starch present;
C	Blue black/blue /black/bluish black;	Starch present;

6/2 = 3 marks

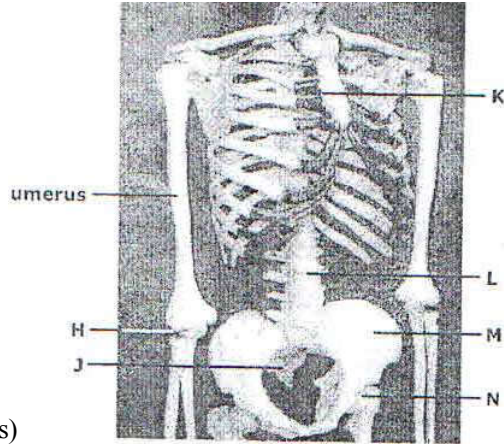
(c) Control experiment

(d) (i) Distase / enzyme /starch digesting enzyme/ ptyalin / saliva enzyme /salivary enzyme; **(1mark)**(ii) Because it is converted / digested / changed starch / can be denatured by boiling / acts within a range of temperature between 35 °C – 38°C / optimum temperature; **only 1 (1 mark)**

(e) Mouth / duodenum / ileum;

NB (f) tied to table (b)(f) B – Starch absent / No colour change /colour of iodine remains because starch has been digested / converted / hydrolysed / broken down into glucose / maltose / simple sugar; **(1mark)**C - Starch present because boiling denatured enzyme /L₂; thus starch not broken down / not digested / not acted upon;

2. The diagram below shows part of a mammalian skeleton, study it and use it to answer the questions that follow.



(a) (4 marks)

- H – Hinge joint
- J - Coccyx
- K – Cartilage of rib / rib;
- N – Head of femur

(b) (i) (1 mark)

Acetabulum;

ii) (2mark)

Ilium; ischium; and pubis;

All present to score.

(c) Any two adaptations of each of the following structures:

(i) Structure M

(2marks)

Has large surface area for attachment of thigh muscles; has a cetabulum which articulates with head of femur.

(ii) Structure L

Large and brooad centrum to offer support;

Broad and long transverse processes; for muscle attachment

(d) Check on the diagram the labels of the letters in brackets.

i) The pubis symphysis (P) (1 mark)

ii) The part where intercostal muscle attach (I) (1mark)

iii) A joint that can turn through 180⁰ only. H (1mark)

3. (i) - Etiolation; (1mark)

(ii) - To reach light; (1mark)

(iii) Positive phototropism; (reject phototropism alone). (1 mark)

(iv) Auxins move; to the darker side ; more auxins on this side cause faster growth; on this side resulting in curvature of the shoot towards the source of light; (4 marks)

A1	A2
- Green	- Yellow (yellowish is incorrect)
- Big leaves	- Smaller
- Shorter stem/ internodes	- Taller / longer internodes
- Thick stems	- Thin stems
- Firm / sturdy plants	- Weal / feeble plants.

(5 marks)

(v) Set A₁ - In light

Set A₂ - In darkness/shaded areas