M/S

NAME.....ADM NO.....SIGN.....

INDEX NO.....STREAM.....

231/3

BIOLOGY PAPER 3

JULY, 2025

Time: 1 hours 45 minutes

MOKASA II JOINT EVALUTION EXAMINATION

Kenya Certificate of Secondary Education

- Write your name, Index Number in the spaces provided above.
- Write the date of examination in the space provided above.
- Answer **ALL** the questions in the spaces provided below each question in the question paper.

FOR EXAMINER'S USE ONLY

Question	Maximum score	Candidate's score
1	16	
2	16	
3	8	
TOTAL	40	

1. You are provided with the following apparatus and reagents:

- Dilute hydrochloric solution
- 5ml Sodium hydroxide solution
- Solution P
- 2 Droppers
- 3 10 ml measuring cylinders
- Stop watch / access to wall clock
- Access to water bath maintained at 37^{0}C- 45^{0}C
- Iodine solution
- Copper (II) Sulphate solution
- 3 droppers
- Benedict's solution
- 6 test tubes on a rack
- Substance M

NOTE: A reagent may be used in more than one experiment.

Experiment 1:Carry out the following tests on substance M

a) Benedict's test

i) Observations (1mark)

Brown Colour of Benedicts retained.

ii) Conclusion. (1mark)

Reducing Sugars absent.

b) Biuret's test

iii) Observations (1mark)

Blue Colour of copper II Sulphate Changes to Purple.

iv) Conclusion. (1mark)

Proteins Present.

c) Iodine test

v) Observations (1mark)

Brown colour of iodine solution retained

vi) Conclusion. (1mark)

Starch absent.

(II) Experiment 2

Based on the conclusions made in (I) above carry out experiment 2 following the procedure below

i) Label 3 test tubes as A, B and C
ii) Put 2ml of substance M in each of the test tubes A, B and C
iii) Add 1ml of solution p in each of the test tubes
iv) In test tube A add 2 drops of sodium hydroxide
v) In test tube B add 2 drops of dilute hydrochloric acid
vi) In test tube C add 2 drops of distilled water
vii) Place three test tubes in water bath for 10 minutes

a) i) State the observations made in test tubes A and B

Test tube A (1mark)

The suspension clears.

Test tube B (1mark)

The suspension is retained.

ii) Account for the observations made in a i) above

Test tube A (3marks)

Alkaline pH was optimum. Proteins broken down to difebtides by substance M.

b) Explain why the investigation was carried out at a specific temperature range (1mark)

It is the optimum temperature

c) State the purpose of test tube C (1mark)

Control experiment.

d) i) Give the identity of P (1mark)

Trypsin.

ii) Name the likely part of the human alimentary canal where the process in this experiment occurs (1mark)

Duodenum.

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

Works best in alkaline pH.

2. You are provided with the following

i) Three petri dishes

ii) Means of labelling

iii) Specimen R

iv) Solution **L1, L2 and L3**

Procedure

Label the three petri dishes as **1, 2 and 3**

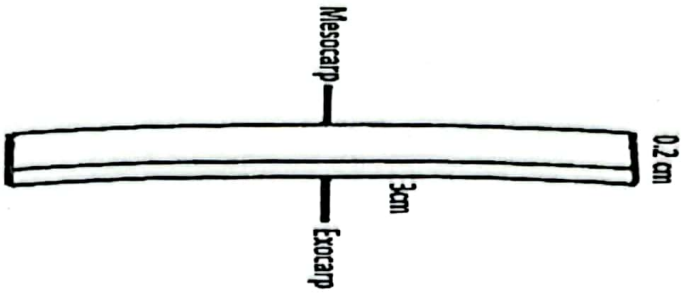
Into each petri dish labelled place about **50 cm^3** of the solution as follows

Petri dish **1 solution L1**

Petri dish **2** solution **L2**

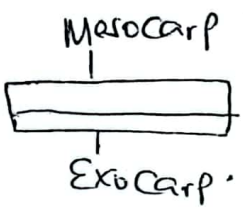
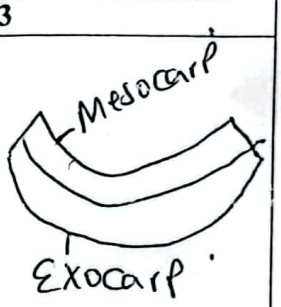
Petri dish **3** solution **L3**

Carefully peel specimen **R,** cut 0.2 cm by 3cm strip, as shown below.



Finally into each petri dish, put the strip of specimen R obtained, and leave the set up for 20 minutes.

i) After 20minutes remove each strip, dry with a blotting paper or tissue paper and make a drawing in each space provided in ten table below. (3marks)

Petri Dish	**1**	**2**	**3**
Drawing appearance of the strips			

ii)) Why was set up **2** included in the experiment (1mark)

Control experiment

iii) What is the nature of solution in petri dish **1,** (1mark)

Hypotonic

iv) Explain the shape of the strip as in petri dish **2** (3marks)

No observable change
Solution L2 is isotonic to the cell sap of mesocarp cells. Therefore no net movement of water

II.Provided are 10 days germinated seedlings in different conditions labelled X and Y. Study them and answer the questions that follow.

i) From the external appearance of the seedlings suggest with reasons the environmental conditions under which each set of seedling was grown

X. Low light intensity / Dim light / Darkness (1mark)

Reasons (2marks)
Longer stems.
Thinner stems.
Yellow leaves.

Y. High light intensity. (1mark)

Reasons (2marks)
Large leaves
Green leaves.
Short stems.

ii) State one advantage of the type of germination exhibited by the seedlings (1marks)

Cotyledons turn green and manufacture additional food for the growing seedling.

iii) Identify the phenomenon shown by the seedlings labelled X (1mark)

Etiolation

3. You are provided with specimen **E** and **F** obtained from the skeleton of a mammal.

a) With reasons, identify the above specimens (4marks)

E Humerus

Reason Head / Trochlea / Bacipital groove

F Radius and Ulna.

Reason Olecranon process

Sigmoid notch.

b) Identify the bones that articulate with the specimen **F** at the distal end. (1mark)

Tarsals.

c) Name the type of joint formed at the anterior and posterior ends of **E** (2 mark)

Anterior - Ball and Socket.

Posterior - Hinge

c) State one function of the part labelled **G** in specimen **F** (1mark)

Prevent overstretching of the arm.

provide site for attachment of muscles and tendons.