

Name..... Index Number.....

Student's Signature.....

231/3
BIOLOGY
PAPER 3
PRACTICAL
JUNE, 2017
1 ¾ HOURS

SUNSHINE SECONDARY SCHOOL
Kenya Certificate of Secondary Education
BIOLOGY
Paper 3
Practical
TIME: 1 ¾ Hours

1. You are provided with 3 test tubes, solution C, droppers, a white tile, iodine solution, 0.1% sodium chloride, 1.4% sodium chloride, Benedicts solution, solution A, water bath and labels
- Label three tests S, T and U. Into each test-tube, place 3ml of solution C.
 - Put a drop of solution C on a white tile and add a drop of iodine solution.

Record your observation.

(1mk)

Iodine solution turns blue black

- Add 3 drops of 0.1% sodium chloride solution and 2ml of solution A to test tube T.

To test-tube U add three drops of 1.4% sodium chloride solution and 2ml of solution A. Sodium chloride is a source of sodium ions. Place the test tube S, T and U in a water bath maintained at 37°C for 30 minutes. Using a drop of the solution from each test-tube repeat the procedure in (a) above and spare the rest for the next question. Record your observation in the table below.

(3mks)

Test-tube	Observation at the end of experiment
S	<i>Iodine turns blue black.</i>
T	<i>Brown colour of iodine retained</i>
U	<i>Brown colour of iodine retained</i>

- Put 2cm³ of solution from test-tube S in a clean test-tube and add 2cm³ of Benedict solution, shake then heat the mixture to boil. Record your final observations in the table below. Repeat the procedure for solution T and U.

(3mks)

Test-tube	Observation at the end of experiment
S	<i>Blue Colour of Benedict's retained</i>
T	<i>Benedict's change from Blue- green to yellow/orange</i>
U	<i>Benedicts changes from blue - green - yellow/orange.</i>

ii) Account for your results in test-tube T and U. (3mks)

T-Benedict's changes to yellow / orange as A digested the starch to maltose / reducing sugar

U – Benedict's solution changes to oranges as A digested the starch completely to maltose/ reducing sugar due to high concentration of sodium ions / cofactor.

Acc – Benedict's solution changes to Orange; as Starch was digested; by enzyme to reducing sugars.

d) Why was the test-tube S included in the experiment? (1mk)

As control

e) Suggest the identity of solution A. (1mk)

Starch digesting enzyme/ diastase/Amylase

f) Why was the water bath maintained at 37°C. (1mk)

Provide optimum temperature for enzyme

2. You are provided with specimen labelled M.

a) Using floral parts and the leaves, classify the plant from which part M was obtained into class and give reasons.

Class Dicotyledonae;

Reasons

Has floral parts in fives; leaf is net veined / reticulate. (3mks)

b) Suggest the pollinating agent for the specimen M and give reasons.

Pollinating agent

insect (1mk)

Reasons (2mks)

- *Scented to attract insects*
- *Flower is brightly coloured*
- *Flower is large and conspicuous*

c) Dissect the flower longitudinally into two equal parts and examine one of the parts using a hand lens.

Describe the following parts

i) Androecium (3mks)

- Has many anthers
- Filaments fuse to form a staminal tube that encloses the style
- The anthers led below the stigma

ii) Gynoecium

(3mks)

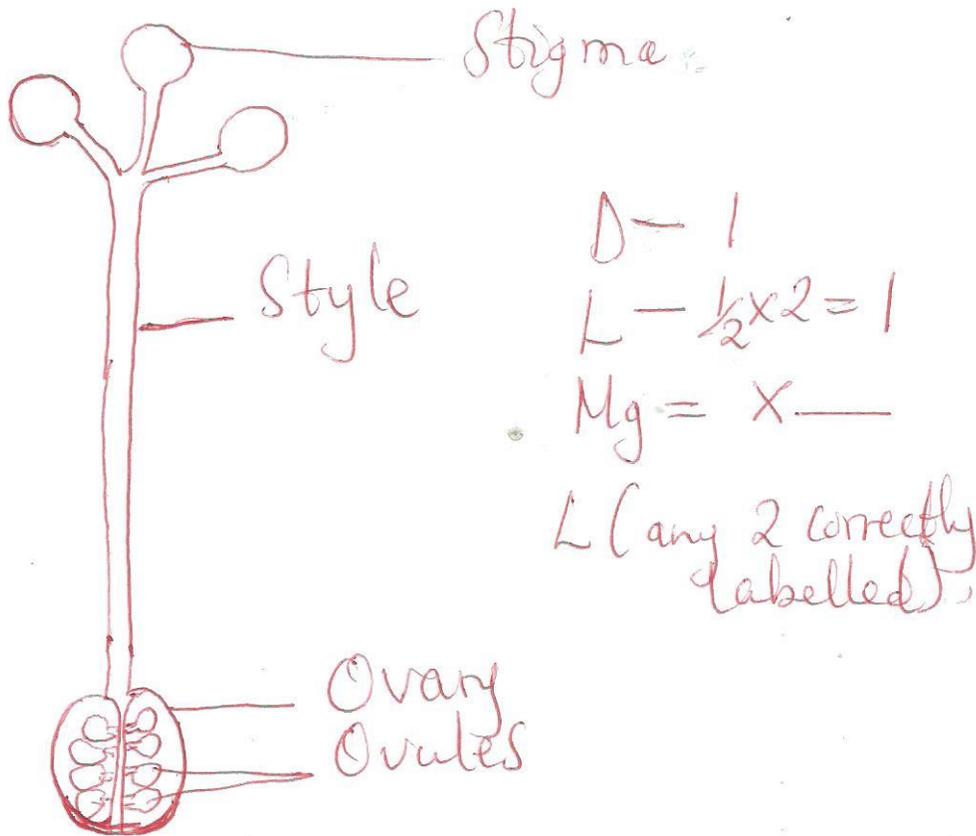
Has a syncarpous pistil

Has five stigmas

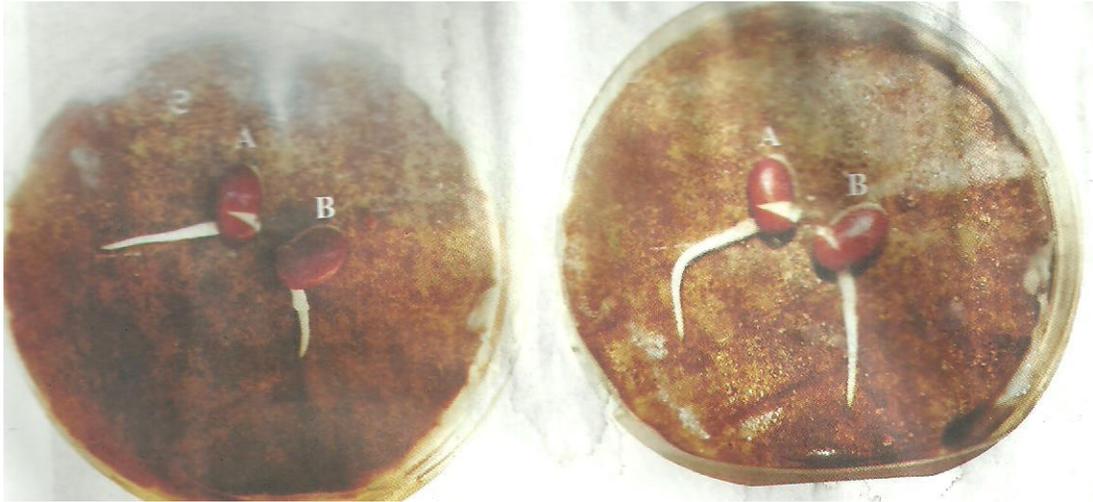
Ovary is superior with several ovules / hypogynous.

Stigma is above anthers

d) Use the hand lens to observe the pistil closely, draw the pistil only and label the parts.



3. The photographs below show an experiment that was set to investigate a certain response in bean seedlings. Examine them.



At the beginning

after 24 hours

- a) Which response was being investigated? (1mk)

Geotropism

- b) Account for the observed results for seedling A after 24 hours. (5mks)

The radical bent downwards due to gravity; which caused auxins to move to the lower surface; higher concentration of auxins on the lower surface; inhibited growth on the lower surface compared to upper surface; where lower conc of auxins which promoted faster growth;

- c) Explain why in seedling B the root continued growing straight down. (2mks)

Gravitational pull acted uniformly on the root tip; hence auxins were equally distributed resulting in uniform growth;

- d) Explain the significance of the response you stated in (a) above to the plant

(2mks)

It enables roots to grow down into the soil for anchorage; and to access water and mineral salts;

- b) Below is a photograph of a mammalian bone, labelled Q.



- i) Identify the bone (1mk)
scapula
- ii) State how the bone is adapted to its functions (3mks)
Has a large triangular surface for attachment of muscles that move the arm;
Has a spine/scapula ridge for muscle attachment;
Has Glenoid cavity for articulation with head of Humerus
- iii) Name the bone that articulates with the bone Q at part labelled X. (1mk)
Humerus
- iv) Name the specific type of joint formed at this articulation. (1mk)
Ball and socket joint