Candidates Name ..... SCZ Salongo 0705-950374 .....

School ..... Signature.....

MARKING SCHEME

553/2
BIOLOGY
PRACTICAL
May – June 2019
2 Hours

RESOURCEFULL EXAMINATIONS TERM II 2019

Uganda Certificate of Education

BIOLOGY

PRACTICAL

Paper 2

2 Hours

INSTRUCTIONS TO CANDIDATES:

- ✓ This paper consists of **three** questions.
- ✓ Answer **all** questions.
- ✓ Answers **must** be written in the spaces provided.
- ✓ Use ***sharp pencils*** for your drawings.
- ✓ Colored pencils must not be used.
- ✓ No additional sheet should be inserted in this booklet.

FOR EXAMINER'S USE ONLY

Questions	Marks
1.	20
2.	21½
3.	18½
Total	60

1. You are provided with specimen **P.** You are required to carry out tests on the specimen following the procedures below.

Procedure

- Using a sharp knife, cut out five cubes from **P** each measuring 1cm X 1cm X 1cm.
- Cut the first cube into **2** equal parts.
- Cut the second cube into **4** equal parts.
- Cut the third into **16** equal parts.
- Cut the fourth into **4** equal parts, put them in a test tube add $4cm^3$ of water and heat to boil, allow them to cool and remove them from water.
- Leave the fifth cube intact.
- Label five test tubes as **1,2,3,4** and **5**
- Add $3cm^3$ of Hydrogen peroxide to each test tube.
- Now, add contents of specimen **P** to each test tube as shown in the table below.

TEST TUBE	CONTENTS
1	One half of the first cube
2	Second cube cut into equal parts
3	Third cube cut into 16 equal parts
4	Fourth cube cute into 4 equal parts, boiled and cooled.
5	Fifth cube left intact.

a) Record your observations in table below. **(05 marks)**

Test tube	Observation
1	Moderate gas bubbles given off; Acc - moderate effervescence. - Moderate reaction - Moderate froth.
2	Many gas bubbles given off; Acc - Rapid effervescence - Rapid reaction - Rapid froth.
3	Very many gas bubbles given off; Acc - Very rapid effervescence. - Very rapid reaction - Very rapid froth.
4	No bubbles given off; Acc - No effervescence - No reaction - No froth.
5	Little gas bubbles given off; Acc - Slow effervescence. - less reaction - little froth.

05.

b) Explain your results in each test tube. **(10 Marks)**

Test tube .1

Cutting cube into half provides moderate surface area; moderate enzyme/active substance react with hydrogen peroxide moderate decomposition of hydrogen peroxide hence moderate bubbling;

02

Test tube 2.

Cutting cube into four parts provides large surface area. Much enzymes/active substances react with hydrogen peroxide Much decomposition of hydrogen peroxide hence many gas bubbles given off.

02

Test tube 3

Cutting cube into sixteen parts provides very large surface area ✓ Very much enzymes/active substances react with hydrogen peroxide ✓ Very much decomposition of hydrogen peroxide hence very much gas bubbles given off ✓ 2

Test tube 4

Boiling the cube denatured ✓ / destroyed active substance, no decomposition of hydrogen peroxide and no bubbles of gas produced ✓ 2

Rej killed the active substance.

Test tube 5.

Leaving the cube intact exposes ~~moderate~~ little active ✓ substance, little decomposition of hydrogen peroxide producing little gas bubbles ✓ 2

c) What being investigated in the tests? **(03 marks)**

Effect of high temperature ✓ / boiling on enzyme activity.

Rej temperature only. Any 3.

Effect of Enzyme concentration ✓

Effect of surface area on activity of enzymes. 3

d) Give **two** conclusions from your results. **(02 marks)**

- High temperature denatures the active substance ;✓1
enzyme.
- Activity of Active substance increases with increase in its concentration ;✓
- Active substance increases with increase in surface area of P ;✓

Any 2 ✓2

2. You are provided with specimens **P, Q and S**. Examine the specimens and answer questions that follow.

(a) Open up **P** longitudinally and also cut transverse sections of **Q** and **S**. observe the sections of **P** and **S** and state three differences between them. **(03 marks)**

Specimen P	**Specimen S**
(i) - One locule ;✓ - Fused layers of pericarp. ;✓	- many locules / loculi ;✓ - Not fused layers. (free pericarp) ;✓
(ii) - Thin pericarp ;✓ - Dry pericarp ;✓	- Thick pericarp. ;✓ - Fleshy pericarp ;✓
(iii) - Seeds arranged along the margin of pericarp on the side. ;✓	- Seeds arranged around the axis radiate from centre. ;✓

Any 3. ✓3 3mks

(b) Identify the type of fruit each specimen Q and S is, basing on their structure. **(02 marks)**

Q

Berry ;✓

9.

S

Berry; ✓ 01.

(i) State the mode of dispersal for specimen **P.** **(01 mark)**

Explosive mechanism; ✓ self dispersal 01.

Rej. self explosive / self mechanism / explosive dispersal.

(08 marks)

~~(07 marks)~~

(ii) Describe how each of the specimens is dispersed.

P

pericarp has lines of weakness / sutures; ✓ which split / open; ✓ along one margin; ✓ of pericarp when dry; ✓ to scatter; ✓ away seeds; ✓ from parent plant. 03

Q

pericarp is fleshy; ✓ brightly; ✓ coloured when ripe which attracts; ✓ animals, eat fleshy fruit, seeds resistant; ✓ to digestive enzymes passed out in feaces; ✓ 2½

S

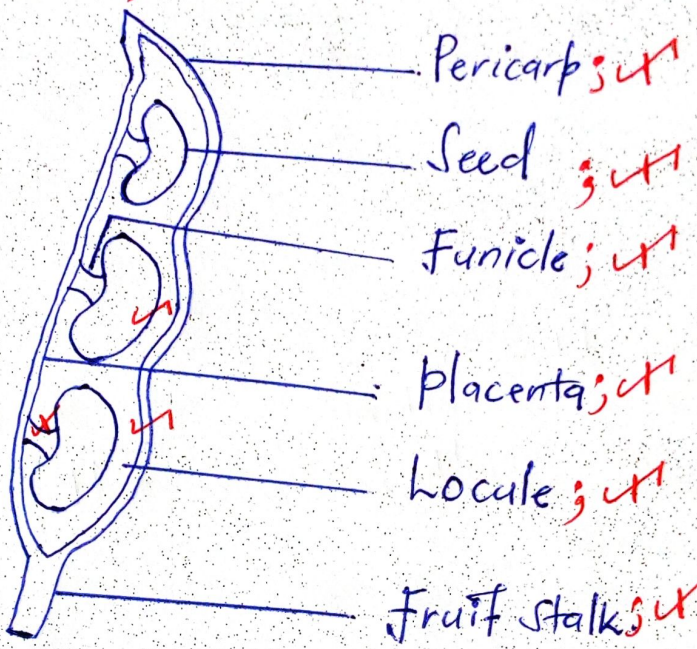
Epicarp is succulent; ✓✓ / fleshy, brightly; ✓✓ coloured attracts; ✓ animals eat the fleshy endocarp; ✓ and throw away seeds; ✓ to another place. 2½

.....

.....

(c) Draw and label a longitudinal section of P. state your magnification. **(07 marks)**

Drawing showing longitudinal section of specimen P. ;



T — 01
D — 02½
L — 02
M — 01
A — 0½
N — 0½
07½

07

Drawing marks
✓ Uniform double lines for pericarp
✓ one seed shape.
✓ funicular structure.

X1 − X3 ;

3. You are provided with specimen **K and L.**

(a) State **three** characteristic features that make them belong to the same class.

(03 marks)

.....

Three main body parts ;

Three thoracic segments ;

Three pairs of legs ;

03

.....

(b) Using a hand lens, observe features of the head region of specimen **K** and **L**. Basing on observable features, give three differences between the specimens.

(03 marks)

Specimen K	Specimen L
- Comma shaped eyes ;	- oval shaped eyes
- Long antennae ;	- short antennae
- Antennae lack bristles ;	- Antennae have bristles
- Has mandibles ;	- has proboscis

Any 3. 03

(c) Describe how the features on the head of specimen **K** enable it live successfully in its habitat. **(03 marks)**

Antennae, long, to serve at a distance, segmented, for flexibility, to reach all directions, thin, to reduce air resistance, allowing movement.
Eyes, large, and broad, provide wide field of view of predators.
Mandibles, serrated for cutting food.
Maxilla and labium, pointed, for flexibity, when pushing food.
Maxillary palps, hairy, for increased sensing of food.

Any 6

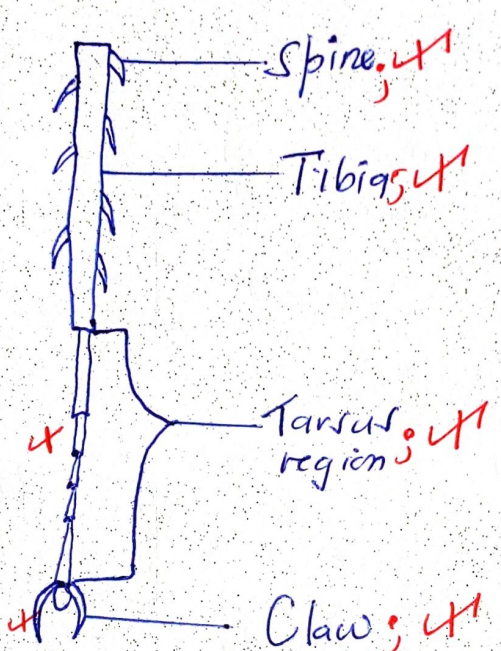
(d) Using a hand lens, observe the dorsal part of the thorax of specimen **L**.

Describe the observable features. **(03 marks)**

Wings, 2, transparent, net work veined.
Halteres, 2, attached on third thoracic segment
3, segments, hairy, striped.

(e) Cut off the hind limb of specimen **K.** Draw the tibia including the tarsi and claws. State your magnification. **(06.5 marks)**

Drawing showing tibia, tarsi and claws of hind limb of specimen K. ✓



T — 01
D — 01½
L — 02
M — 01
A — 0½
N — 0½
06½

Drawing marks
✓ curved claw
✓ 1st and last tarsus segment are longer than middle segments

X3 — X5. ✓

END

CONFIDENTIAL

No. 1

P Is big sized **IRISH POTATO** tuber

No. 2

P is Fresh bean pod

Q is raw tomato

S is ripe Orange

No.3

Specimen **K** is freshly killed mature **COCKROACH**

Specimen **L** is a mature **HOUSEFLY**