

MOCK I EXAMINATIONS 2022

Biology practical

PAPER 3

TIME: 3 HOUR 15 MINUTES

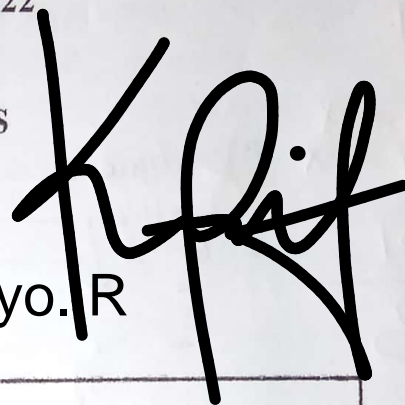
INSTRUCTIONS:

This paper consist of three questions

Attempt all questions.

Answers must be written in the spaces provided only

Kityo. R

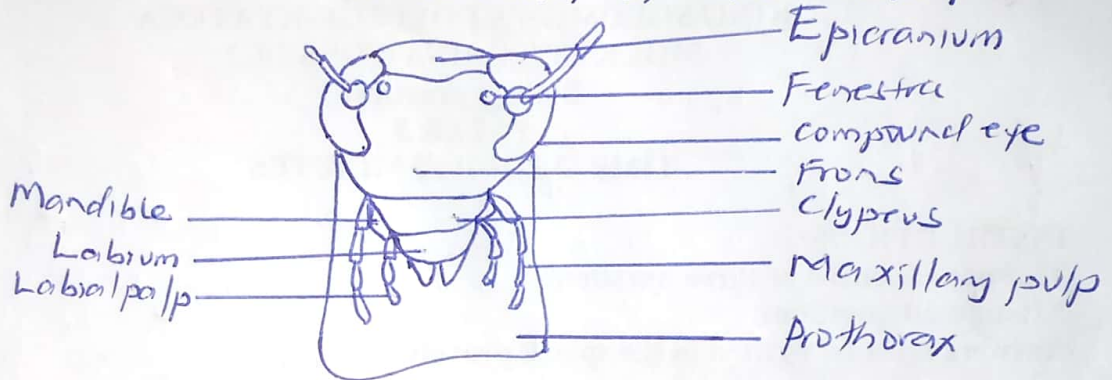


For Examiners' Use Only		
Question	Marks	Examiner's Signature
1		
2		
3		
Total		

1. You are provided with specimen 'T' which is freshly killed.

- (a) Place the specimen ventral side upper most and cut off its antennae & limbs. Observe the head and the first thoracic segment. Draw and label. (13 marks)

A DRAWING OF THE VENTRAL VIEW OF THE HEAD AND FIRST THORACIC SEGMENT OF SPECIMEN T



- (b) Turn the specimen dorsal side upper most and examine the wings when pulled outwards. Describe their structure.

(i) Outer wings (1½ marks)

1½ long; narrow; hard; straight; translucent; veined (net-venation)

(ii) Inner wings (1½ marks)

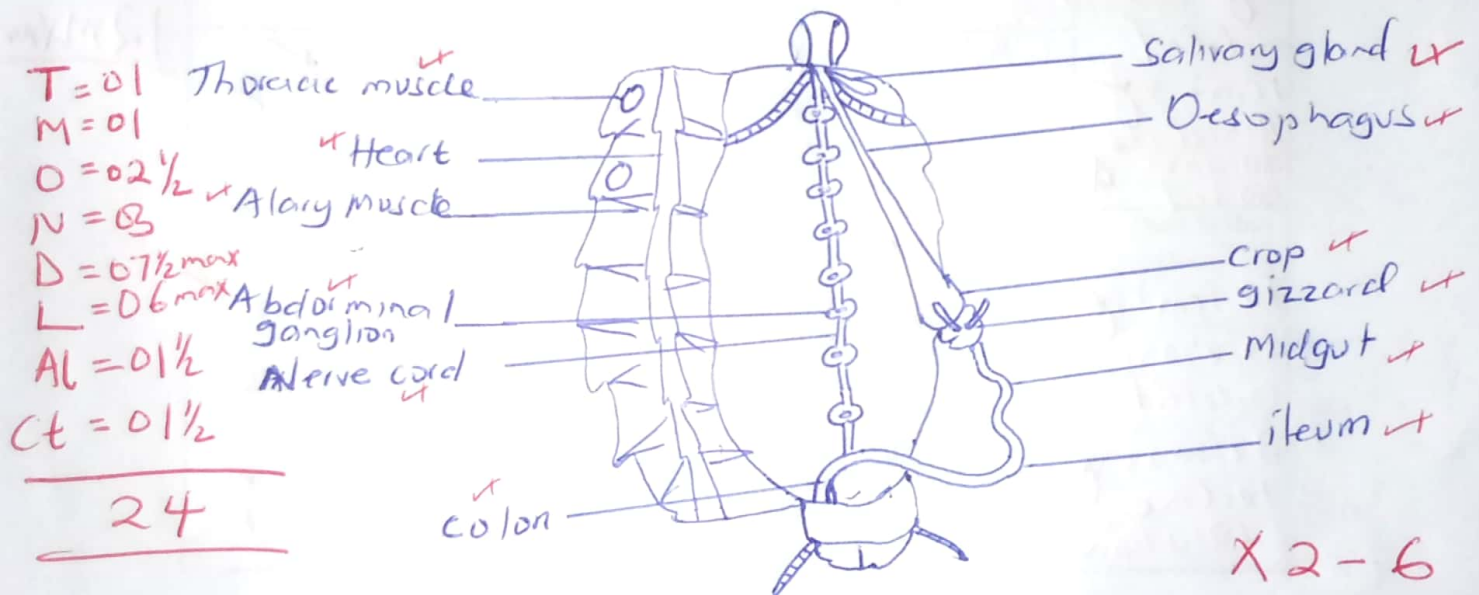
1½ Broad; folded; membranous; transparent; veined (net-veined)

- (c) Cut off the wings. Cut along the right lateral line of the body from the anterior part of the thorax up to the 8th segment. Turn the dorsal cuticle to the left and clear any fat tissues. Carefully displace only the exposed structures of the digestive system to the right to display structures on the ventral cuticle. Draw and label your dissection showing:

- All internal structures on both cuticles.
- Parts of the digestive system used for storage, digestion and absorption.

(24 marks)

A LABELED DRAWING OF THE INTERNAL STRUCTURES ON THE DORSAL AND VENTRAL CUTICLE, PARTS OF THE DIGESTIVE SYSTEM USED FOR STORAGE, DIGESTION AND ABSORPTION DISPLACED TO THE RIGHT OF SPECIMEN T



NA If ;

- Malpighian tubules labelled
- Any part beyond the colon drawn and labelled ; ie rectum, gonapophyses

2. You are provided with solutions D, E and X. You are to carry out tests on solutions D and E and investigate the action of X on the solutions.
- (a) Carry out tests in Table 2 to determine the food nutrients in D and E. Record your tests, observations and deductions in the table. (12 marks)

Table 2

Tests	Solutions	Observations	Deductions
Benedict's test To 1 cm ³ of solution added 1 cm ³ of Benedict's solution & boiled	D	turbid colourless solution turns to blue solution & persists on boiling.	reducing sugars absent
	E	Turbid solution turns to blue solution & persists on boiling.	Reducing sugars absent
Iodine test To 1 cm ³ of solutions added 3 drops of iodine solution	D	colourless solution turns to brown solution	starch absent
	E	Turbid solution turns to black solution	much starch present

12 max

- (b) Label four test tubes as 1, 2, 3 and 4 and add contents to each test tube as shown in Table 3

Table 3

Test tube 1	1cm ³ of X + 3cm ³ of D.
Test tube 2	1cm ³ of X + 3cm ³ of E.
Test tube 3	1cm ³ of X + 5cm ³ of D + 1cm ³ of Y.
Test tube 4	1cm ³ of X + 3cm ³ of E + 1cm ³ of Y.

Incubate the test tubes for 30 minutes in a water bath maintained at (37 – 40)°C.

After 30 minutes, divide the contents of each test tube into two and carry out the iodine and Benedict's tests as shown in Table 4. Record your observations and deductions in the Table. (14 marks)

Test tube	Test tube	Observation	Deduction
Iodine Test Added 3 drops of iodine solution	1	Turbid solution turns to brown solution	Starch absent ✓
	2	Turbid solution turns to blue solution	Moderate starch present ✓
	3	Turbid solution turns to brown solution	Starch absent ✓
	4	Turbid solution turns to blue solution	Moderate starch present ✓
Benedict's Test Added 1cm ³ of Benedict's solution and boiled	1	Turbid solution turns to blue solution; green yellow to orange ppt	Much reducing sugars present ✓
	2	Turbid solution turned to blue solution; to green solution	Little reducing sugar present ✓
	3	Turbid solution turned to blue solution; to green; to yellow ppt	Moderate reducing sugars present ✓
	4	Turbid solution turns to blue solution & persists	Reducing sugars absent ✓

14 marks

(c) From your results, state the nature of solutions X and Y giving reasons for your answer.

(i) X

(03 marks)

X - is a biological catalyst; or enzyme in nature. Solution X has enzymes which catalyses the breakdown of starch to reducing sugars; catalyses the breakdown of solution D to reducing sugars.

(ii) Y

(01 mark)

Solution Y provides an unfavourable medium which inhibits and slows down the enzyme activity; and therefore activity stops.

3.

(30 marks)

You are provided with specimens P, Q and R

- a) Examine specimens P and its floral parts under low power magnification. Describe the structure of:

- i) Inflorescence of the specimen

(4 marks)

04 P has numerous florets of 2 types; tubular florets with at higher level than ray florets; florets surrounded with bracts; florets closely packed;

- ii) Visible parts of floret from periphery of the specimen.

(4 marks)

04 Corolla - free at apex, fused base; ventral; free at apex is broad; calyx - many long; thin and hairy. Ovary - long; thin; with sutural lines of weakness.

- b) Remove a complete floret from each specimen and observe using a hand lens.

- i) Give two ways each floret is structurally unique from the others. (6mks)

02 P 1. Forked stigma
2. 2 types of florets; long thin calyx

02 Q 1. Stamens; long curved ovary
2. perianth

02 R 1. Stamens attached onto corolla
2. Nectar guides present

- ii) What is the adaptive role of one unique feature of each specimen is as recorded in (b) (i) above.

(3 marks)

01 P Forked stigma provides a large surface area for pollen grains

01 Q Perianth is broad to protect the inner parts

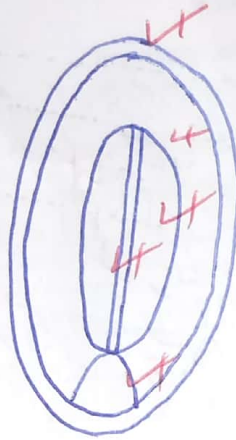
01 R Nectar guides eases pollination

- c) Cut three transverse sections of the ovary of specimen Q and transfer into 5 drops of the stain provided for 10 minutes. Mop any excess stain before observing under low power magnification. Draw, but don't label. (4 ½ marks)

DRAWING OF THE TRANSVERSE SECTION OF OVARY OF SPECIMEN Q UNDER LOW POWER MAGNIFICATION

Marking points

- Epicarp
- Mesocarp
- 2 cotyledons
- Funicle
- Gap between cotyledons



$$D = 0.2\frac{1}{2}$$

$$M = 0\frac{1}{2}$$

$$T = 0\frac{1}{2}$$

$$N = 0\frac{1}{2}$$

$$\text{Oval shape} = 0\frac{1}{2}$$

$$0.4\frac{1}{2}$$

X 20-50

- d) Remove another complete floret from specimen R. Split it longitudinally in to halves. Examine one half from inner view under low power magnification. Draw and Label. (8 ½ marks)

A LABELED DRAWING OF THE LONGITUDINAL SECTION OF ONE HALF OF SPECIMEN R FROM INNER VIEW

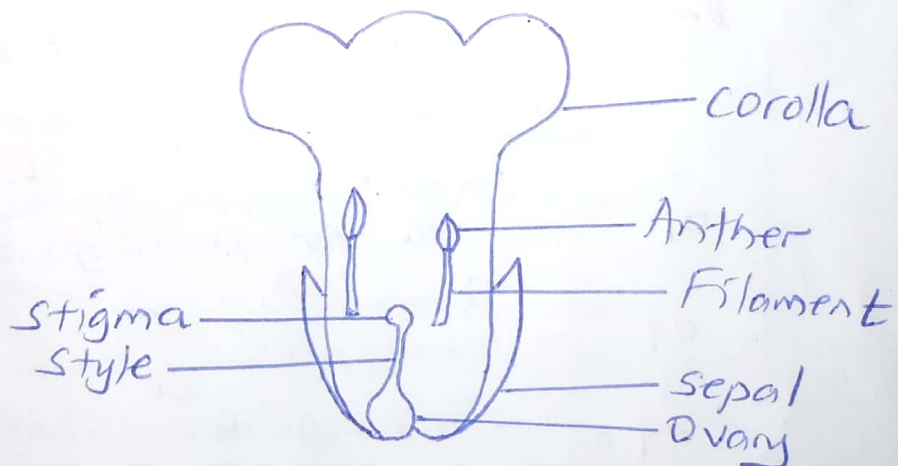
$$D/L = 0.7$$

$$M = 0\frac{1}{2}$$

$$T = 0\frac{1}{2}$$

$$N = 0\frac{1}{2}$$

$$0.8\frac{1}{2}$$



END

X 5-10

MOCK 1 2022 S.6 BIOLOGY P530/3 INSTRUCTIONS

Each candidate must be provided with

No. 1

- Specimen **T**: fresh killed cockroach
- Hand lens
- Dissection board + kit

No. 2

15 cm³ of 2% sucrose solution, labelled **D**.

15 cm³ of 1% starch solution, labelled **E**.

10 cm³ of 2% yeast solution freshly prepared, labelled **X**.

10 cm³ of 2 M hydrochloric acid, labelled **Y**.

10 test tubes.

Thermometer.

Beaker (250ml).

Access to:

- reagents used for carrying out food tests.
- hot water
- source of heat.

No. 3

Freshly obtained inflorescences of:

P - Mature *Tridax* (with clear forked stigma)

Q - Mature *Cassia*

- R - Mature *Lantana camara*

- Microscope

- Methyl blue stain