

Name: Frank

Signature: School:

P530/3
BIOLOGY
(Practical)
Paper 3

COORDINATED GUIDE

3¼ hours

Uganda Advanced Certificate of Education

BIOLOGY
(Practical)

Paper 3

3 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

Answer all questions.

All answers must be written in the spaces provided.

Turn Over

1. You are provided with a freshly killed animal specimen labeled W. Study it and then answer the questions that follow:

(a) Open its mouth and using fingers pull out the tongue gently.

(i) Describe the structure of the tongue.

(02 marks)

It is elastic ✓

It is sticky ✓

Accept - long ✓ Forked

02

(ii) Relate the above tongue structure to the role of the tongue in feeding.

(02 marks)

Forked tongue; in crease SA for capturing prey.

It is elastic to stretch in order to capture distant prey/food ✓

It is sticky to firmly hold prey/food ✓

02

(b) Loosen the floor and roof of the mouth cavity by cutting along both sides of the buccal cavity.

Open the buccal cavity widely in cross section to expose the structures concerned with feeding and gaseous exchange. Draw and label.

(06 marks)

A drawing of the structures of the buccal cavity of specimen W that are concerned with feeding and gaseous exchange:

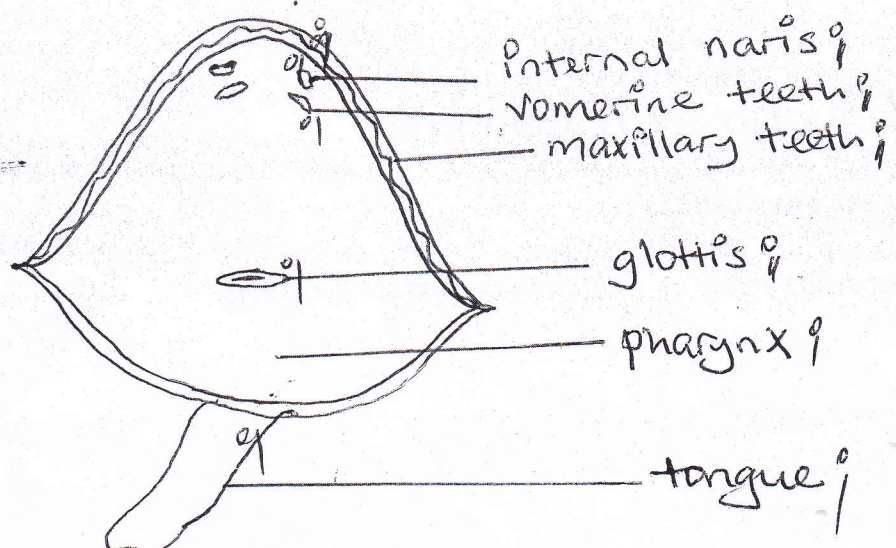
DL = 04

M = 0½

T = 01

~~A~~ = 0½

06

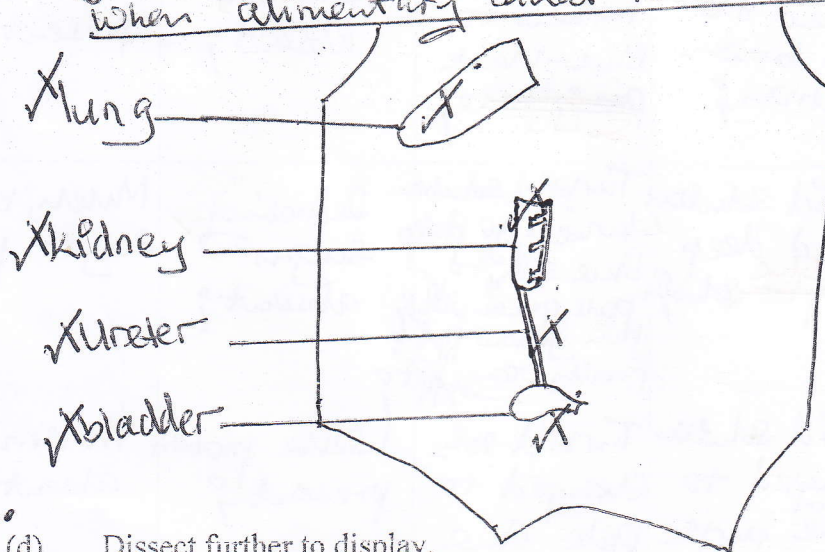


X1-X4?

- (c) Dissect the specimen. Cut out the alimentary canal to display the internal structures seen on the right side of the specimen that ^{are} used for gaseous exchange and removal of waste materials. Draw and label. (08 marks)

(NB: Keep the alimentary canal for No.2)

A drawing of the internal structures of specimen W seen on the right side of the specimen, used for gaseous exchange and removal of waste materials when alimentary canal is cut out.



D-02
L-02
M-01
T-01
N-01
O-01

08 MARKS

Defect Piler lobe

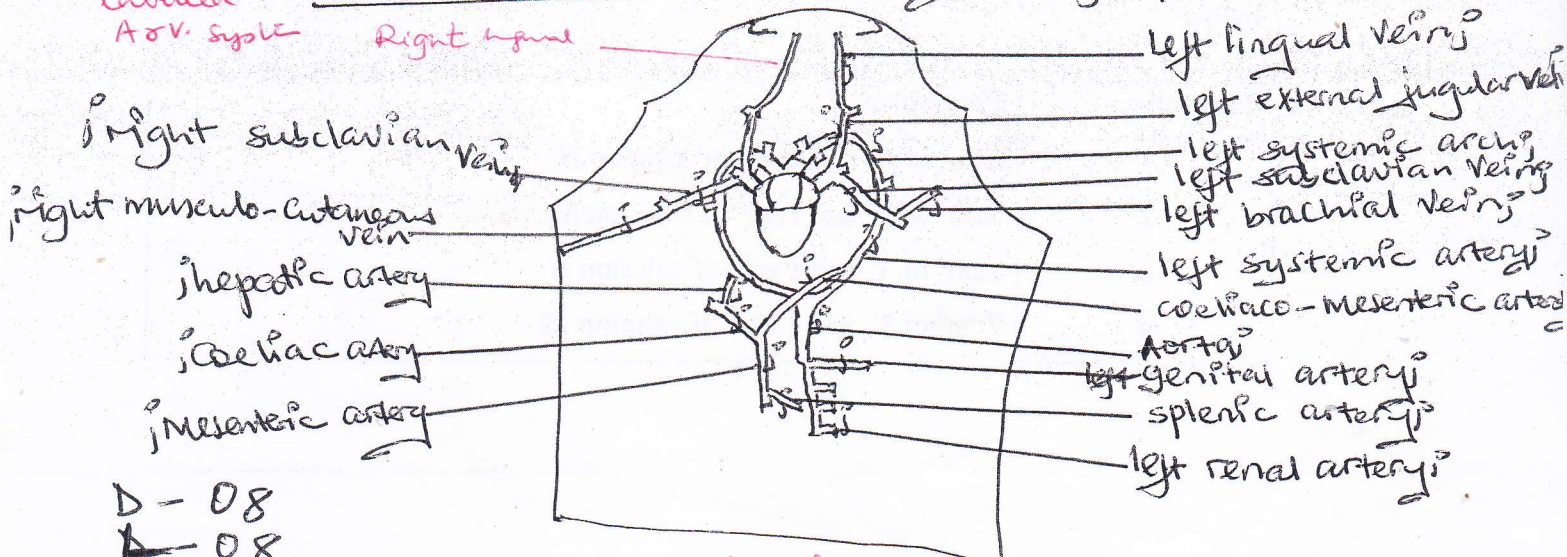
- (d) Dissect further to display,

- Blood vessels that carry blood from the right part of skin, left fore limb and floor of the mouth back to the heart.
- Route of blood flow from the heart to structures visible in the abdominal region.

Draw and label the blood circulation displayed with undeflected heart.

A drawing of blood vessels draining the right part of skin, left forelimb, and floor of mouth and those carrying blood from heart to the structures visible in the abdominal region of specimen W.

Rej-Drawn & labelled A & V. Syst



D-08

A-08

2. You are provided with solutions X and Y that contain nutrients and solutions M and N.
- (a) Identify the food substance in solutions X and Y using the reagents provided. Record your tests, observation and deductions in the table I below. (21 marks)

Table I

TESTS	OBSERVATIONS		DEDUCTIONS	
	X	Y	X	Y
Iodine test To 1cm ³ of each solution added 3 drops of Iodine solution	Turbid solution turned to deep brown solution	Turbid solution turned to blue-black precipitate solution	Starch absent	Much starch present
Benedict's test To 1cm ³ of each solution added 1cm ³ of Benedict's solution and boiled	Turbid solution turned deep blue purple solution	Turbid solution turned to deep blue solution, pale greenish then yellow finally orange	Reducing sugar absent	Much reducing sugar present
Buuret's test To 1cm ³ of each solution added 1cm ³ of NaOH(aq) then 3 drops of CuSO ₄ (aq)	Turbid solution changed to pale purple solution	Turbid solution changed to pale blue solution	Little protein present	Protein absent

- (b) Cut a piece of the stomach from the alimentary canal of the dissected animal measuring about 1.5cm. Open it and pour out the contents, wash and grind it in a mortar. Add 10cm³ of distilled water. Leave to settle then decant. Label the extract S.
- Label your test tubes 1, 2, 3 and 4 then add contents to each test tube as shown below.

Test tube	Procedure
1	2cm ³ of X and 1cm ³ of solution N
2	2cm ³ of X and 1cm ³ of solution M
3	2cm ³ of Y and 1cm ³ of solution N
4	2cm ³ of Y and 1cm ³ of solution M

Divide extract S into four equal portions and add a portion to each test tube 1, 2, 3 and 4. Incubate the test tube contents at 40°C for 50 minutes.

- (i) Observe test tubes 1 and 2 and record your observations and deductions in table II below. (04 marks)

Table II

Test tube	Observation	Deduction
1	Turbid solution Partially/completely cleared?	Partial / complete / hydrolysis breakdown of suspended solids on solution
2	Turbid solution Remained turbid as before?	suspended solids not broken down?

04

- (ii) Identify the food substances in test tube 3 and 4 using the reagents provided. Record your observations and deductions in table III below. (14 marks)

Table III

Test tube	Tests	Observations	Deductions
3	Iodine test	Turbid solution changed to blue-black precipitate?	Much starch present?
	Benedict's test	Turbid solution turned deep blue soln; to pale green soln; yellow ppt, and finally to orange ppt? X	Much reducing sugar present?
	Buireds' test	Turbid solution turned pale purple solution?	Little protein present?
4	Iodine test	Turbid solution turned blue-black precipitate?	Much Starch present?

	Benedicts test	Turbid solution turned deep blue solution, then pale green solution, yellow solution, finally orange.	Much reducing sugar present.
	Buirets test	Turbid solution turned pale purple solution.	Little protein present.

14

- (iii) From your results, state two properties of the active substance in solutions S. (02 marks)

Its catalysing effect is favoured by medium provided by solution N but its inhibited by medium M.
 It is substrate specific in its action by catalysing breakdown of protein but not starch.
 (c) Explain your results in (b) (i) and (ii) above. (07 marks) 02

Solution N provided a partially/completely favourable medium for the active substance in extract S to partially/completely catalyse the breakdown of suspensions in solution X.

Solution M provided unfavourable medium so active substance in extract S could not catalyse the breakdown of suspensions in solution X.
 Starch was not digested in test tube 3 since active substance catalyses digestion of protein but not starch. thus even no more reducing sugar formed.

3. You are provided with specimens P and Q. - Bean pod
 (a) Describe the structure of specimen P. (02 marks) 07

Its long, tapering at both ends, with a rough and hairy surface.
 It has 2 lines of weakness, emerging it a long and thin, hard stalk.

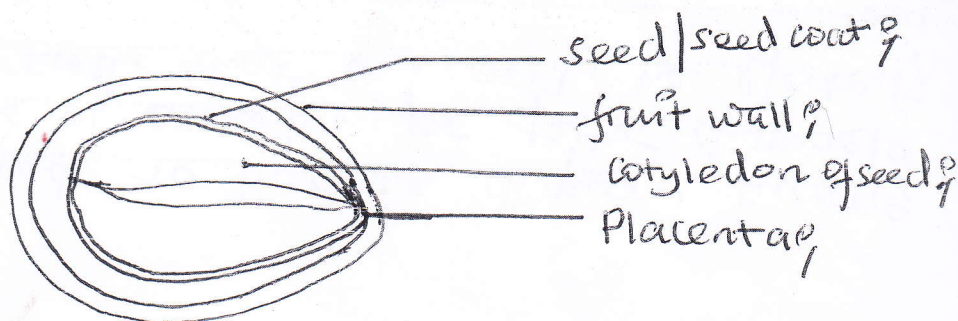
02

Cynodopsis gynandra
Bear pool;

- (b) Using a sharp blade, carefully cut the cross sections of specimens P and Q across the middle segment of each specimen.
- (i) Draw and label the cross sectional structures visible for specimen Q. (04 marks)

A drawing of the cross sectional structures of specimen Q;

$D/L = 0.3$
 $M = 0.5$
 $T = 0.5$
0.4

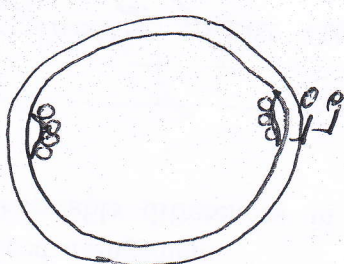


X 2 - X 5; 04

- (ii) Observe the cross section of specimen P. Draw but do not label.

A drawing of the cross section of specimen P; (03 marks)

$D/L = 0.2$
 $M = 0.5$
 $T = 0.5$
0.3



03

X 2 - X 5; ✓

(c) Open the specimen longitudinally by cutting along the region without seed attachment. Observe the seed arrangement.

(i) Outline **three** observable differences in seed arrangement for both specimens. (03 marks)

P	Q
Seeds attached marginally along two sutures.	Seeds attached marginally along a single suture.
Many seeds crowded at a placenta.	Only one seed attached at a placenta.
Seeds scattered at placenta facing in different directions.	Seeds linearly arranged end to end.

03

(ii) With **two** reasons, state the specimen which has a dispersal advantage over the other. (03 marks)

Specimen : P. ✓

01

Reasons.

Many seeds to increase dispersal success;
Two lines of explosion for faster dispersal;
smaller seeds that can easily be ejected.

Any 2

02

END