Name: ..... Index No.....

School: ..... Signature: .....

553/2
BIOLOGY
(PRACTICAL)
PAPER 2
July/August 2018
2 hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(PRACTICAL)

Paper 2

2 hours

INSTRUCTIONS TO CANDIDATES:

- This paper consists of **three** questions.
- Answer **all** questions.
- All answers should be written in the spaces provided.
- Drawings should be made in the spaces provided.
- Use sharp pencils for your drawings.
- Coloured pencils or crayons should **not** be used.
- No additional sheets of writing paper are to be inserted in the booklet.
- Work on additional sheets will **not** be marked.

FOR EXAMINER'S USE ONLY.

Question	Marks	Examiner's No. & Initials
1		
2		
3		
TOTAL		

A- Extract from
B- Extract from
W - cockroach
X - Termites

You are provided with extracts A and B from same plant organ, but of different plants. You are to investigate the PH and relative abundance of ascorbic acid/vitamin C in these extracts.

(a) To 2cm^3 of extract A in a test tube, dip in damp red and blue litmus papers. Record your observations in table 1 below.

(b) Repeat the above procedure (a) using extract B.

(c) Fill in your observation in table I below.

Table 1

Extract	Observation		Conclusion
	Damp blue litmus paper	Damp red litmus paper	
A	Turns red ✓	red ✓	Extract of A is ✓ acidic in nature/ Solution has low PH
B	Turn red ✓	red ✓	Extract of Soln A is acidic in nature Solution B has low PH

(06 marks)

(d) Carry out the following tests on the extracts A and B and record your observations and deductions in table II below.

Table II

Test	Observations	Deductions
(i) To 1cm^3 of extract A in a test tube, add 3 drops of Iodine solution.	Turbid colourless Soln / Pink turns brown Solute pink ✓	Starch absent ✓
(ii) Repeat test (i) above using extract B	Pink / red ✓ Soln turns brown Solute	Starch absent.
(iii) To 1cm^3 of DCPIP in a test tube add extract A drop by drop until there is no further change. Record the number of drops.	Blue Soln turns to colourless / decolourised 5-2 drops ✓	Vitamin C present ✓

(iv) Repeat test (iii) using extract B.	...solution of ... turns to colourless solution / Acc decolourised if ~40 drops	... pink

(11 marks) OR ½

(e) Explain your results in table I above. (01 mark)

...Both extract A and B are acidic, because they turned blue litmus paper red.....

.....

(f) Compare results in test (d)(iii) and d(iv) and explain the number of drops used in the tests. (02 marks)

...Extract A has less vitamin C than extract B. ...more drops of extracts were used to decolourise DCPIP solution...

...Both extracts have vitamin C. ✓

Acc Reason depending on the taste

...Are same concentration

.....22

2. You are provided with specimens O and P which are plant organs.

(a) Giving one reason in each case, identify specimens O and P (04 marks)

Specimen	Identity	Reasons
O	Seed; or ... Dicot seed ✓	- One scar; Hilum / Seed coat / testa; ✓
P	Fruit; ✓	Two scars / remains of Style and point of attachment to the fruit ✓ (04)

(b) Using a scalpel/razor blade and without damaging the internal structures, carefully cut around the outside of specimen O so that you obtain two halves. For specimen P, cut it longitudinally through the position of cotyledon to obtain two halves.

(i) List down four observable features which distinguishes specimen O from specimen P in the table below. (04 marks)

Specimen O	Specimen P
Has no pericarp	has pericarp

(ii) Mention two similarities between specimen O and specimen P. (02 marks)

....

....

....

....

(c) Describe how the structures of specimen O are adapted for growth of the specimen. (03 marks)

....

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....

(d) With the help of a hand lens, make a fully labeled drawing of one half of specimen O with internal structures. State your magnification. (07 marks)

3. You are provided with specimens W, X, Y and Z.

(a) Examine the specimens W, X, Y and Z and state three external features which are characteristic of the class to which the specimens belong. (03 marks)

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(b) Give four (4) differences between specimen Y and specimen Z. (04 marks)

Specimen Y	Specimen Z

(c) Observe the specimens W, X, Y and Z and complete the table below about the structures of the specimens. (04 marks)

Specimen	Number of wings	Number of legs
W		
X		
Y		
Z		

(d) Using the characteristics in the table above, construct a dichotomous key to identify the specimens. (03 marks)

(e) Place specimen W ventral side upper most. Draw and label the last three abdominal segments of the specimen. State your magnification. (06 marks)

END

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MARKING GUIDE
Uganda Certificate of Education
UCE August 2018
BIOLOGY 553/2

1.

Table I

Extract	Observation		Conclusion
	Damp blue litmus paper	Damp red litmus paper	
A	~~Remains blue~~ Turns red/pink ✓	Remains red ✓	~~Neutral extract~~ Extract was acidic ✓
B	Turns red/pink ✓	Remains red ✓	Acidic extract; ✓

(06 marks)

Table II

d)

Test	Observations	Deductions
(i)	~~Milky/cloudy~~ Colourless/turbid solution/pink solution; turns to brown or yellow solution; ✓	Starch absent; ✓
(ii)	~~Orange~~ Turbid Red/Pink/Pale red brown solution; ✓/Yellow solution ✓	Starch absent; ✓
(iii)	Blue solution of DCPIP; ✓ decolourised; ✓ 10-20 drops; 5—25 drops ✓	Vitamin C/Ascorbic acid. Present; ✓
(iv)	Blue solution of DCPIP; ✓ decolourised/turned colourless solution ✓ 5-9 drops; 4—40 drops ✓	Vitamin C Present; ✓

(11 marks)

Rej: Yellow/Red Solution. ie: Colour without a state.

Rej: Values outside the range ut give cm to correct explanation in line 5th difference is the values for (iii) and (iv)

Both extracts A and B have acidic or low pH.

e) Extract B is acidic because it turned blue litmus paper red; ✓
And extract A is a ~~neutral extract~~ acidic because it ~~had no effect on both~~ turned blue ~~and red~~ litmus paper red/pink. ✓ (02 mark)

Rej: the reason if one writes had no effect on red litmus paper.

f) Both extracts A and B contain Vitamin C. ✓
Extract A has less Vitamin C than extract B; because more drops of extract were used to decolourise DCPIP; ✓ (03 marks)

Or

Extract B has more Vitamin C than A; because less drops were used to decolourise DCPIP; ✓

22 mrks

Note: Extract A may be with more Vitamin C than B, depending on the specimens used to make the extracts. Thus attach the explanation for (f) to the results in the table II. 20marks

2. (a)

Specimen	Identity	Reasons
O	Seed; Accept: Dicot seed; Reject: legume	One scar/Hilium Seed coat/testa;
P	Fruit; ~~Accept:~~ Caryopsis	Two scars/remains of style and point of attachment to kob/Two points of attachment ~~Fused testa;~~ Presence of a pericarp

(04 marks)

(b) (i)

Specimen O		Specimen P
Free seed coat/ testa	;	Fused testa
Two cotyledons	;	One cotyledon
Has no endosperm	;	Has endosperm
~~Plumule and radicle easily seen~~	;	~~Plumule and radicle not easily seen~~

- Has no pericarp
- One scar

Has a pericarp;
Two scars

04 marks)

(ii) **Similarities**

- Both have cotyledon;
- Both have embryo;
- Both have testa;

(any 02 mark)

Reject . both have scars

Acc. both have scar.

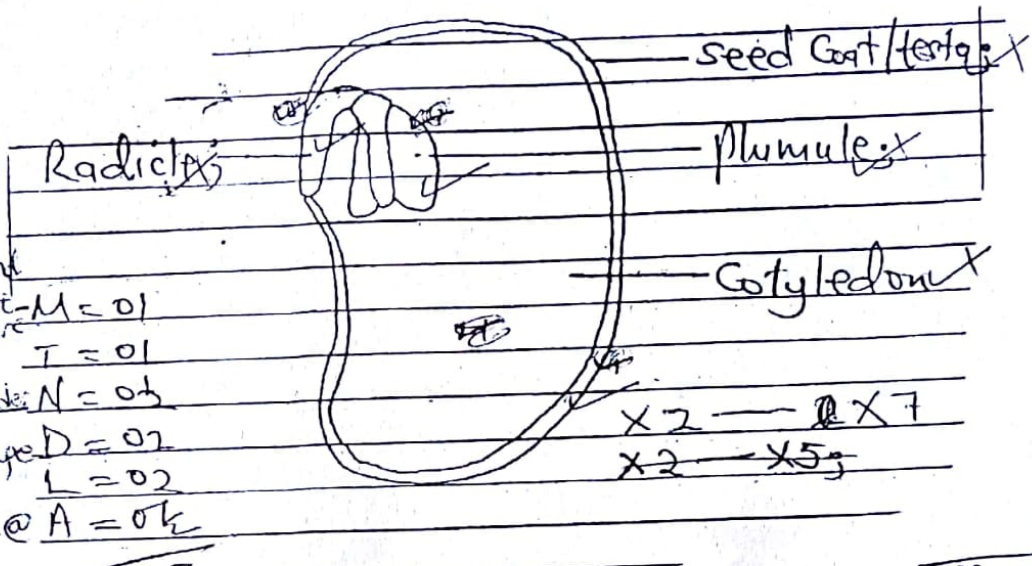
(c)

- Has hard testa/seed coat to protect the internal structures;
- Has swollen cotyledons for storage of food materials;
- ~~Testa can easily soften when taken in water to allow easy penetration of radicle~~ during germination.
- Has embryo which develops into a plant; (any 03 marks)

Acc: Radicle for development into root system;

Plumule for development into shoot system;

(d) Drawing of one half of specimen O with internal structures



Drawing marks
* Testa; */f; neatness, continuous and inner line present or fused anywhere
* Plumule
* Radicle
Consider: M = 01, T = 01, N = 01, D = 02, L = 02, A = 01
any 02: Full mark @ 07
Accuracy marks
- it is a true picture of what is supposed to be drawn.

20marks

3. (a) **Similarities among the specimens**

- Three pairs of legs;
- Three main body parts;
- Three segmented thorax (prothorax, mesothorax, metathorax);

(03 marks)

(b) Differences between specimen Y and Z

Specimen Y		Specimen Z
*No proboscis	;	Has proboscis
*Two main body parts	;	Three main body parts
*Four pairs of legs (8 legs)	;	Three pairs of legs (6 legs)
*No antennae	;	A pair of antennae
*Has a carapace.	;	Has no carapace.
*No wings	;	A pair of wings
*Is not hairy.	;	Is hairy.
*(c) No Compound eyes.		Has 2 large compound eyes.

Any 04

(04 marks)

Specimen	Number of wings	Number of legs
W	Four / 4 / 2pairs	Six / 6 / 3pairs
X	0	Six / 6 / 3pairs
Y	0	Eight / 8 / 4 pairs
Z	Two / 2 / One pair	Six / 6 / 3pairs

(04 marks)

Acc:
No wings
None
Wingless
for X and Y on the number of wings.

(d) Dichotomous key to identify specimens W, X, Y, Z

Rej:
- Arrows
- Without Lines
- Lines must be broken.

Attach the dichotomous key to the table in (c) i.e Wrong table makes the key wrong.

1 (a) Specimen with wings.....go to 2 ✓
(b) Specimen without wings.....go to 3 (03marks)

OR

1 (a) Specimens with 6 legs — go to 2
(b) Specimen with 8 legs — Y

2 (a) Specimen with one pair of wings.....Z
(b) Specimen with two pairs of wings.....W ✓

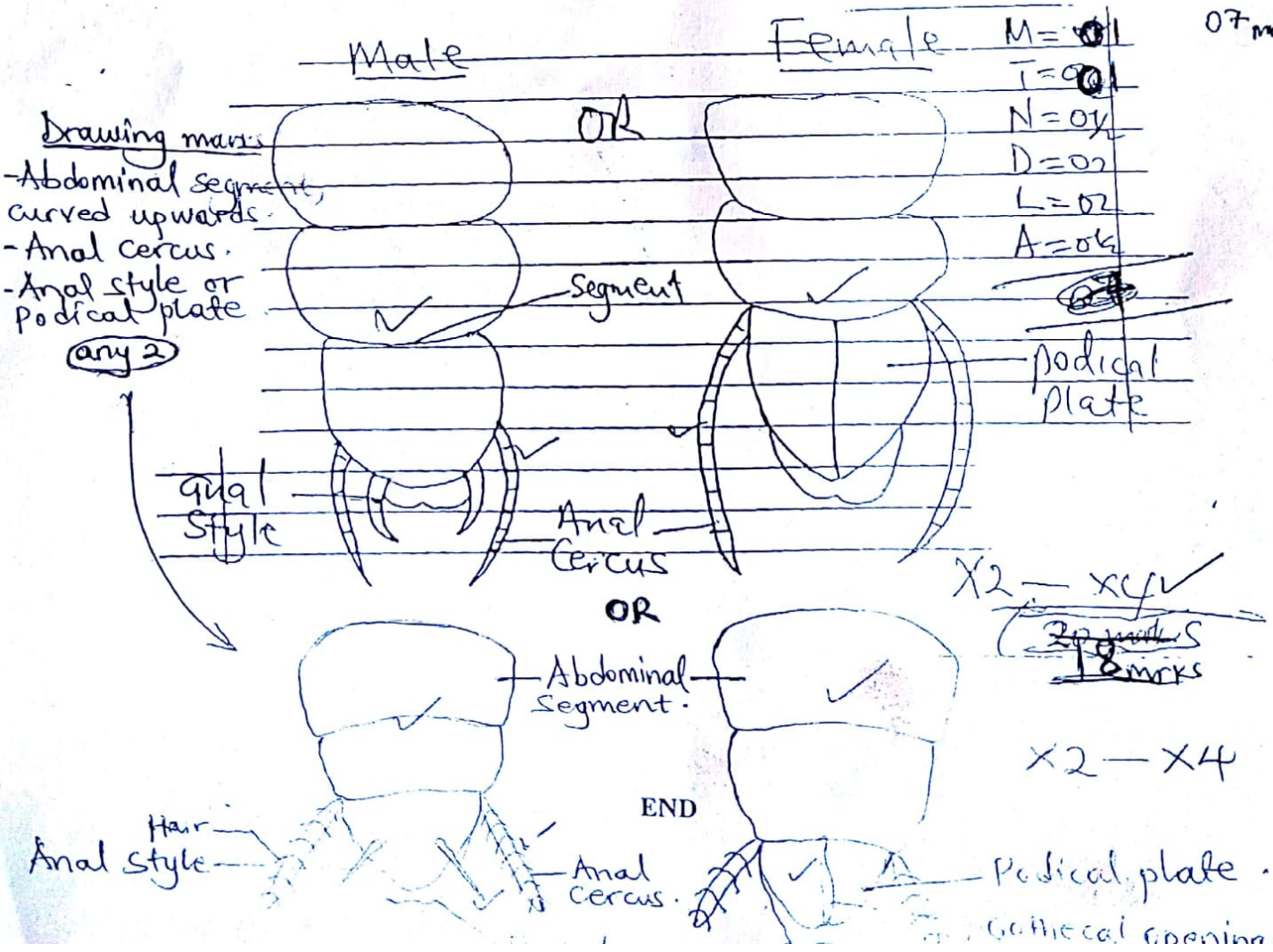
2 (a) Specimens with wings — go to 3
(b) Specimen without wings — X

3 (a) Specimen with six legs.....X
(b) Specimen with eight legs.....Y ✓

3 (a) Specimen with 4 wings — W
(b) Specimen with 2 wings — Z

(a) Drawing showing the last three abdominal segments of specimen W when ventral side upper most; ✓

07 marks



Drawing marks
- Abdominal segment curved upwards.
- Anal cercus.
- Anal style or Podical plate

any 2

M = 01
T = 01
N = 01
D = 02
L = 02
A = 01

X2 — X4 ✓

20 marks 18 marks

X2 — X4