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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	22	SCZ 11
2	20	SCZ 11
3	18	SCZ 11
TOTAL	60	

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1. 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	Turned red;	Remained Red;	Acidic extract;
B	Turned red;	Remained red;	Acidic extract;

(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.	Colourless / Turbid / pink solution; turned brown / yellow solution;	Starch absent;
(ii) Repeat test (i) above using extract B	Red / pink / turbid solution turned to brown / yellow solution	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 solution of DCPIP turned to colourless solution; Acc. Blue colour of DCPIP turns colourless. (5 – 25) drops;	Vitamin C present; Acc. Ascorbic acid present.

(iv) Repeat test (iii) using extract B.	Blue solution of DCPIP decolourised; Acc. Blue sol^n of DCPIP turns colourless (4-40) drops	Vitamin C present; Acc Ascorbic acid. 2½

(11 marks)

(e) Explain your results in table I above. (02 marks)

Both Extract A and B are acidic; 02

Because turns blue litmus red;

(f) Compare results in test (d)(iii) and d(iv) and explain the number of drops used in the tests. (03 marks)

Mark depending on the table

Acc - No of drops The more the no of drops needed to decolourise DCPIP sol^n, the less the conc of ascorbic acid.

Both extracts A and B contain Vitamin C / ascorbic acid;

But Extract A contains more Vitamin C than B because required less drops to decolourise DCPIP than B.

Consider results from table II; B can contain more than ascorbic acid / Vitamin C than A 03 depend on drops required.

2. You are provided with specimens O and P which are plant organs. (04 marks)

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

Specimen	Identity	Reasons
O	Seed; Accept Dicot seed Rej. legume.	- One scar / hilium; - Seed coat / testa. 02
P	Fruit; Rej Cargopsis	- Two scars; Accept - Has two points of attachment to Kob - Has pericarp 02

(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 seed coat / testa ;	Has testa.
Has two cotyledons ;	Has one cotyledon.
Has no endosperm ;	Has endosperm
Plumule and radicle easily seen. ;	Plumule and radicle not easily seen
Has no pericarp ;	Has pericarp
Has one scar ;	Has two scars

Any correct 4. 1 1

4mks.

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

Both have cotyledon ;
Both have embryo ; Any 2
Both have testa ;

Rej. Both have scars Acc. Both have radicle and plumule

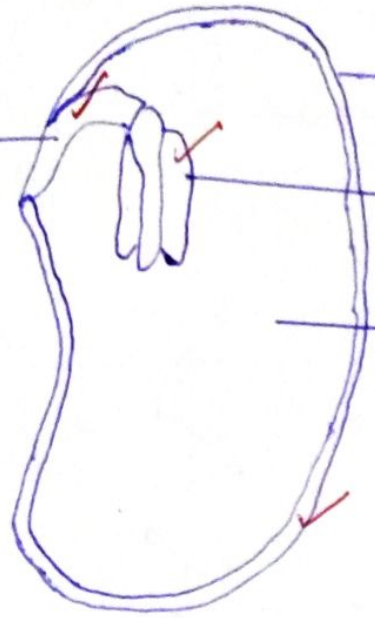
(c) Describe how the structures of specimen O are adapted for growth of the specimen. (03 marks)

Hard testa / seed coat, to protect the internal structures.
Swollen cotyledons, for storage of food materials. Any 3.
Has embryo which develops into a plant

Acc. Radicle for development into root system.
plumule for development into root system.

(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)

Drawing of one half of specimen O showing internal structures. ;



Seed coat / Testa; ✓

Radicle; ✓

plumule; ✓

Cotyledon; ✓

T = 01
D = 02
L = 02
M = 01
A = 0½
N = 0½

N. ✓
A. ✓

x2 — x7 ✓

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)~~ (00 mark)

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N.A

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

Specimen Y	Specimen Z
Two main body parts ;✓	Three main body parts.
four pairs of legs ;✓	Three pairs of legs
No antennae ;✓	a pair of antennae
No wings ;✓	a pair of wings.
Not hairly ;✓	Hairly
No compound eyes ;✓	has. Compound eyes

Any 4.

4 mks

(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	4 / 2 pairs ;✓	6 / 3 pairs ;✓
X	0 ;✓	6 / 3 pairs ;✓
Y	0 ;✓	8 / 4 pairs ;✓
Z	2 / 1 pair ;✓	6 / 3 pairs ;✓

04 mks

Accept words for figures.

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

1a specimen with wings ---- go to 2
1b specimen without wings --- go to 3
2a specimen with one pair of wings --- Z
2b specimen with two pairs of wings --- W
3a specimen with six legs ---- X
3b specimen with eight legs --- Y

3mks

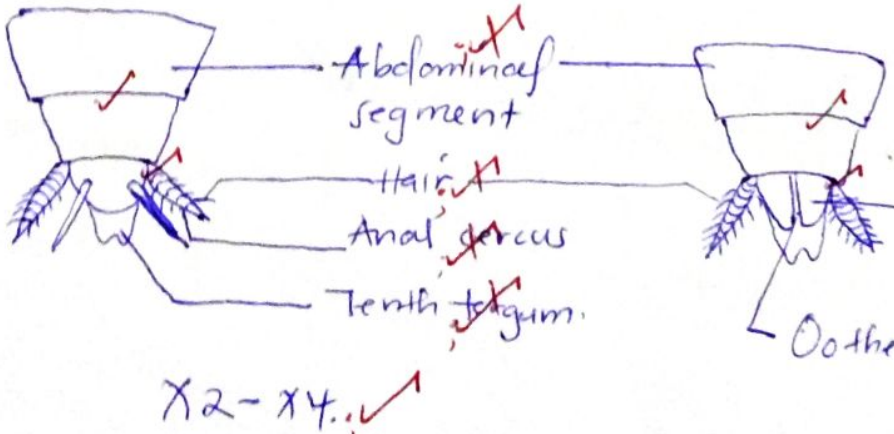
OR.

1a specimen with 6 legs ---- go to 2
1b specimen with 8 legs --- Y
2a specimen with wings --- go to 3
2b specimen without wings --- X
3a specimen with 2 pair of wings --- W
3b specimen with 1 pair of wings --- Z

(e) Place specimen W ventral side upper most. Draw and label the last three abdominal segments of the specimen. State your magnification. ~~(06 marks)~~ 07 marks

Drawing showing the last three segments of specimen W when ventral side upper most

Male or Female



X2 - X4

T = 01
S = 02
L = 02
M = 01
A = ok
N = ok

N; ✓
A; ✓

- labelling, any 4 parts correctly
- drawing points /segment, anal cercus
- drawing marks
  - size
  - location
  - shape
  - continuity of outline

END