P530/3

Biology Practical

Paper 3

July - August, 2023.

3 ¼ Hours

UGANDA MUSLIM TEACHERS' ASSOCIATION

JOINT MOCK EXAMINATIONS 2023

UGANDA ADVANCED CERTIFICATE OF EDUCATION

BIOLOGY

PAPER 3

3 ¼ HOURS

Name .....

Centre/Index No. .....Signature .....

INSTRUCTIONS TO CANDIDATES:

- *Attempt all questions in this test paper.*
- *All answers must be written in the spaces provided.*
- *Neat work is recommended.*
- *You are not allowed to start working within the first 15minutes. You are advised to use this time to read through the paper and ensure that you have all the apparatus, chemicals and specimens you require.*

For Examiner's use only		
Qn	**Marks**	**Initials**
1.		
2.		
3.		
Total		

1. You are provided with specimen **R** which is freshly killed. Examine the external feature using a hand lens where necessary.

(a) Giving a reason(s); state the habitat of specimen **R.** (2 marks)

Habitat.....

Reason(s).....

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(b) Measure the length of; (4 marks)

(i) Entire body including antenna.....mm

Length of antenna.....mm

Ratio of entire body: antenna

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(iii) Explain the significance of the ratio above to the life of the specimen **R.** (2 marks)

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(c) Observe the attachment and position of the wings using a hand lens.

(i) Describe the attachment and position of the wings. (2 marks)

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(ii) Explain the significance of the attachment and position of the wings to the life of the animal.

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(2 marks)

(d) Dissect specimen R along the right lateral line to displace the dorsal cuticle. Clear off any fat. Flood with water. Note the structures that flood with water. Note the structures that float on the ventral cuticle. Draw and label the floating structures and the internal structures on the dorsal cuticle. (22 marks)

(e) (i) Cut the gizzard transversally, observe under low power.
Draw and label. (4 marks)

(ii) Relate the structures observed above to their functions. (3 marks)

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2. **60 MINUTES (34 MARKS)**

You are provided with specimen **Q** and **S**

(a) Carry out the following instructions:

(i) From specimen **Q** cut cubes Q_1 (1cm× 1cm× 1cm) and Q_2 (2cm × 2cm × 2cm)

(ii) Add $30cm^3$ of solution S into each of the beakers labelled Q_1 and Q_2 and immerse the two cubes into solutions in respective beakers. Leave to stand for 1 hour.

(iii) Enter the information required in **table 1** below show your method. (6 marks)

	CUBE Q_1	**CUBE Q_2**
SURFACE AREA (A)		
VOLUME (V)		
RATIO A:V		

(b) After 1 hour, remove the cubes from the solutions. Measure the size of the cubes and volume of solution in each beaker.

(i) Record your answer below (4 marks)

	Q_1	Q_2
Size of the cube		
Volume of solution		

(ii) Comment on the relationship between **A:V** ratio of the cubes in (a)

(iii) above and change in volume of solution (2 marks)

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(iii) Assess the significance of the results of this experiment to organisms of different sizes.

(4 marks)

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(c) Prepare $20cm^2$ extract from another cube same size as Q_2

(i) Carry out iodine and Biuret tests, observations and deductions in **table 2** below. (8 marks)

TEST	OBSERVATIONS	DEDUCTIONS
Iodine test		
Biuret test		

(ii) Add $3cm^3$ of solution R in a tube plus same quantity of the extract. Incubate the contents of the tube at temperature 35-40°C. Repeat the tests in Table 2 above after 5 and 20 minutes of incubation and record your observation in Table 3 below: (4 marks)

Table 3

	OBSERVATIONS	
	Iodine test	**Biuret test**
5Mins		
20Mins		

(iii) Explain the results in Table 3 above (4 marks)

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(iv) What two conclusions can you draw from results of investigations carried out in **c) (ii)** above? (2marks)

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3. **(27 marks)**

You are provided with

40 black (B) and white (W) seeds

Two plastic beakers **A** and **B** (you may use your pockets)

Three petri dishes label them **WW, WB** and **BB**

Carry out the following instructions.

ROUND 1

(i) Count 20 seeds of each colour and transfer into each of the beakers

(ii) Pick a seed from each beaker to make a pair and place the pairs in the respective petri dishes, continue picking until all the seeds get finished from the beakers.

(iii) Record your result below

ROUND 2

Repeat procedure in round 1 above but reduce the number of black seeds in each beaker to 10.

ROUND 3

Repeat procedure in round 1 but with only 5 black seeds in each beaker.

TABLE OF RESULTS

Round	**1**			**2**			**3**		
Pair	WW	WB	BB	WW	WB	BB	WW	WB	BB
No of pairs									
Ratio									

From the results above and using your biological knowledge on inheritance, Answer the following questions;

(a) Giving reasons, suggest what the following represent in nature;

(i) the seeds (2 marks)

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(ii) Process of picking and pairing the seeds (2 marks)

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(iii) beakers **A** and **B** (2 marks)

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(b) State and explain the genetic principles underlying the results in

(i) ROUND 1 (4 marks)

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(ii) round **2** and **3**

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(c) (i) What would happen if only white seeds were placed in beakers **A** and **B**?

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(ii) Predict the result of occurrence of phenomenon similar to that in (c) (i) above in natural populations.

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END

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ADVANCE INSTRUCTIONS

UGANDA MUSLIM TEACHERS' ASSOCIATION

UMTA JOINT MOCK EXAMINATIONS – 2023

UGANDA ADVANCED CERTIFICATE OF EDUCATION

Biology paper 3

CONFIDENTIAL

INSTRUCTIONS

Great care should be taken that the information given below does not reach the candidates either directly or indirectly.

Each candidate should be provided with the following.

- Freshly killed cockroach labelled **R.**
- Dissecting board
- Microscope
- One slide
- Medium sized Irish potato labelled **Q**
- Solution **S** is 1M sucrose solution
- A knife
- 6 test tubes

- Wall clock
- Reagents for carrying out food tests
- 1% hydrogen peroxide solution labelled **K**
- Thermometer
- Hot water
- Two plastic beakers
- 3 Petri dishes
- 45 white beans labelled **W**
- 45 black beans labelled **B**

END

Solution R – 2% Amylase Solution.