

Name.....Signature.....

School.....Index No.....

553/1

BIOLOGY

PAPER 1

July/August 2023

2 hours



BIO-CHEMISTRY TEACHER'S ASSOCIATION MOCK EXAMINATIONS

(BCTAME)

Uganda Certificate of Education

BIOLOGY

Paper 1

2 Hours 30 minutes

INSTRUCTIONS TO CANDIDATES;

This paper consists of 3 sections A, B and C.

*Answer **ALL** questions in section A and section B in the spaces provided.*

*Answer any **2** questions from section C. any additional question answered in this section will not be marked. **Graph paper already attached.***

For examiner's use only				
Section	No	Marks	Examiner's initials and No	
A	1-30			
B	31			
	32			
	33			
C				
TOTAL				

SECTION A (30 marks)

1. Which of the following is a correct taxonomic order of classification?
A. Kingdom-phylum-class-order- genus-family-species
B. Kingdom-phylum-order-class-genus-family-species
C. Kingdom-phylum-order-class-family-species-genus
D. Kingdom-order-phylum-class-family-genus-species
2. Which of the following is not true about stems?
A. Bears leaves at the nodes
B. It has flowers or fruits
C. It has axillary bud located at tip of the stem
D. It has nodes and internodes
3. Which of the following greatly contributes to soil erosion?
A. Over grazing
B. Deforestation
C. Slopes of land
D. Bush burning
4. Which of the following is the best method of conserving soil erosion?
A. Contour ploughing
B. afforestation
C. terracing
D. mulching
5. Which of the following triggers the process of photosynthesis?
A. carbon dioxide
B. oxygen
C. water
D. sunlight energy
6. Which of the following is the correct order of digestion in humans?
A. ingestion-digestion-absorption-assimilation-egestion
B. digestion-ingestion-absorption-assimilation-egestion
C. egestion-digestion-absorption-assimilation-ingestion
D. assimilation-ingestion-digestion-assimilation-egestion
7. the following are components of each tooth except
A. crown
B. neck
C. gum
D. root

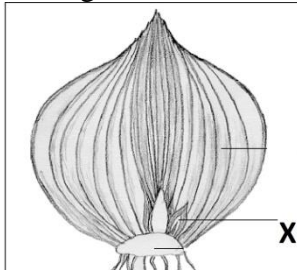
8. The lipase enzyme catalyses the breakdown of?
- A. sucrose
 - B. proteins
 - C. maltose
 - D. fats
9. Which of the following features is common to both class insect and class arachnida?
- A. having three main body divisions
 - B. possession of an exoskeleton
 - C. have three pairs of legs
 - D. possession of antennae
10. Which one of the following characteristics is for a fruit dispersed by water?
- A. pericarp with lines of weakness
 - B. fibrous mesocarp
 - C. wings
 - D. hooks
11. Which of the following conditions causes the fastest rate of transpiration?
- A. wet and warm
 - B. dry and cold
 - C. dry and warm
 - D. wet and cold
12. Non-endospermic seeds store their food in?
- A. endosperm
 - B. embryo
 - C. testa
 - D. cotyledon
13. Which of the following structures are simple sugars produced from?
- A. chloroplast
 - B. cell wall
 - C. cytoplasm
 - D. vacuole
14. Which of the following would be a correct sequence of succession on an abandoned tarmac road?
- A. Mosses → Herbs → Shrubs → Trees
 - B. Herbs → Mosses → Shrubs → Trees
 - C. Shrubs → Herbs → trees → mosses
 - D. Mosses → Herbs → trees → shrubs

Turn Over 3

15. Which of the following equations would represent anaerobic respiration in plants?
- A. Glucose \longrightarrow carbon dioxide + energy
 - B. glucose \longrightarrow water + alcohol + energy
 - C. Glucose \longrightarrow carbon dioxide + alcohol + energy
 - D. Glucose \longrightarrow carbon dioxide + water
16. Which of the following is the effect of the release of luteinizing hormone in humans?
- A. Maintains pregnancy
 - B. Causes development of graafian follicles
 - C. Brings about ovulation
 - D. Brings about thickening of uterine walls
17. Which of the following stages of mitosis do chromosomes assemble at the equator?
- A. Interphase
 - B. Anaphase
 - C. Prophase
 - D. Metaphase
18. Which of the following adaptations of leaves is not important in the uptake of carbondioxide?
- A. Well distributed network of veins
 - B. Large air spaces in the spongy layer
 - C. Large number of stomata on the leaf surface
 - D. Flat and broad surface of the leaf
19. Which of the following occurs when the person is looking at a near object?
- A. Lens become short and thick
 - B. Suspensory ligaments contract
 - C. Lens becomes long and thin
 - D. Ciliary muscles relax
20. A pure breeding red-flowered plant was crossed with a pure breeding white flowered plant. All the F1 offspring had pink flowers. What percentage of the F2 plants would have red flowers if the F1 plants were self-pollinated?
- A. 33%
 - B. 25%
 - C. 50%
 - D. 100%
21. Which one of the following is the best way of ensuring that yeast added to sugar produces ethanol?
- A. By placing the mixture in warm conditions
 - B. By supplying a lot of oxygen to the mixture
 - C. By using a lot of sugar in the mixture
 - D. By excluding air from the mixture

Turn Over 4

22. The figure below shows the longitudinal section of an onion



What is the role of part labeled X

- A. Protection
- B. Vegetative propagation
- C. Anchorage
- D. Food storage

23. The materials that pass from the mother to the foetus during pregnancy period are;

- A. Nitrogenous wastes, oxygen and glucose
- B. Nitrogenous wastes, carbondioxide and mineral salts
- C. Amino acids, oxygen and glucose
- D. Amino acids, mineral salts and carbondioxide

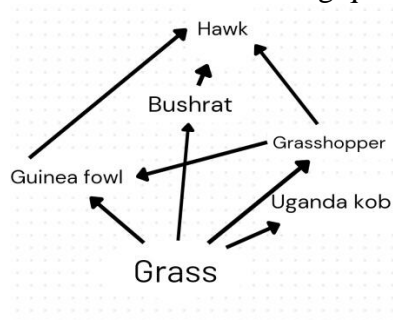
24. The following features show discontinuous variation except;

- A. Haemophilia
- B. Height
- C. Blood group
- D. Sickle cell

25. Short transverse processes and vertebrarterial canals are characteristics of;

- A. Lumbar vertebrae
- B. Thoracic vertebrae
- C. Sacral vertebrae
- D. Cervical vertebrae

26. The figure below shows a feeding relationship in a certain ecosystem. Study it carefully and answer the following questions.



Turn Over 5

Which of the following organisms acts as both a primary consumer and a secondary consumer?

- A. Hawk
- B. Grasshopper
- C. Bush rat
- D. Guinea fowl

27. Which of the following gland produces a hormone that influences breathing during exercise?

- A. Anterior pituitary glands
- B. Islets of Langerhans
- C. Adrenal glands
- D. Thyroid glands

28. A hormone that affects the process of osmoregulation in the blood is called;

- A. Glucagon hormone
- B. Anti-diuretic hormone
- C. Adrenaline hormone
- D. Insulin hormone

29. Which of the following occurs during upstroke in birds?

- A. Pectoralis minor relaxes
- B. Pectoralis major relaxes
- C. Pectoralis minor contracts
- D. Pectoralis major contracts

30. Which of the following products is excreted by both plants and animals?

- A. Urea
- B. Ammonia
- C. Carbondioxide
- D. Uric acid

SECTION B

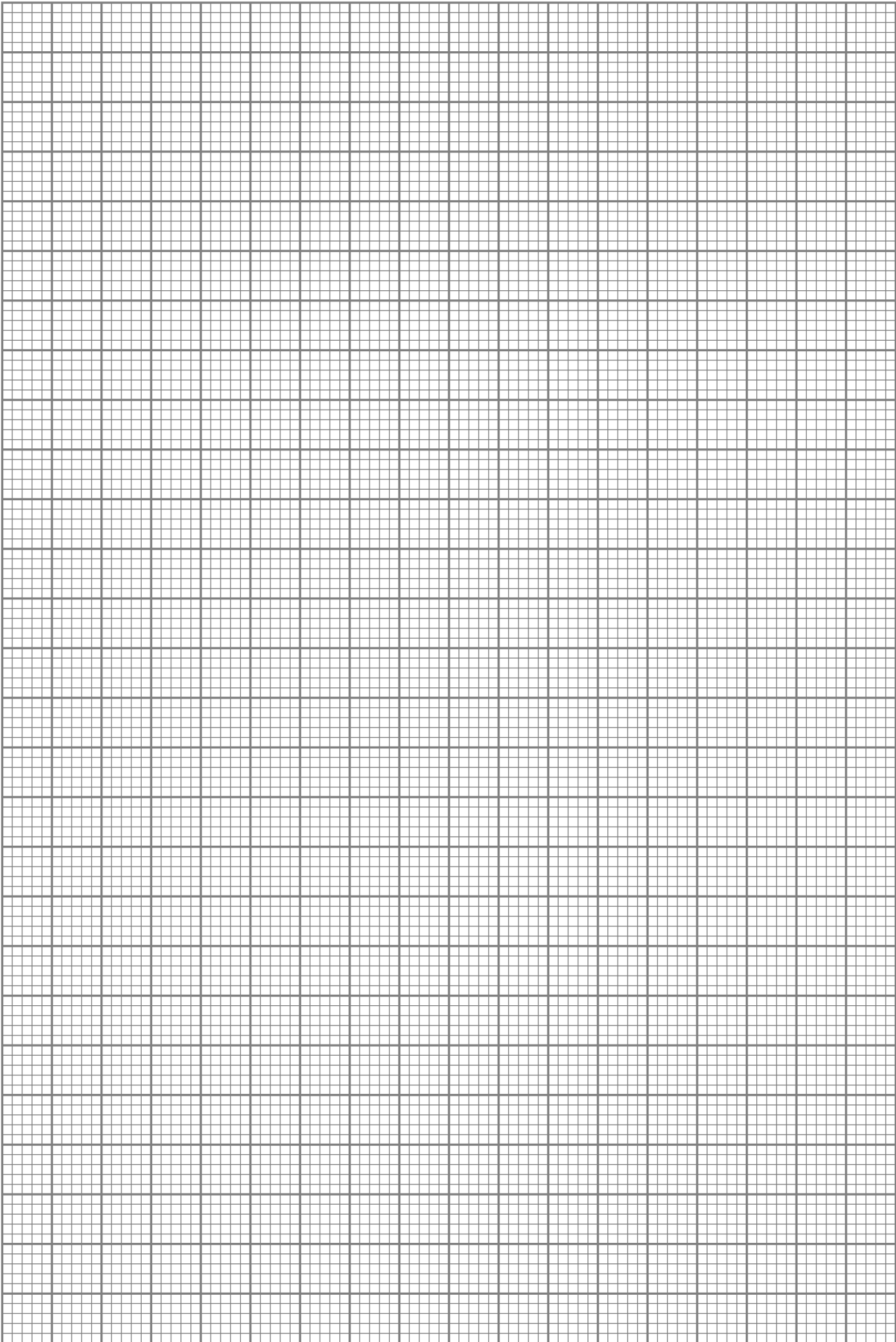
*answer **all** questions in this section*

31. Small pieces of potato cylinders were placed in solutions of different salt concentration, after four (4) hours they were removed from the solution, wiped dry re-weighed. The results were as shown in the table below.

Percentage salt concentration	Percentage change in mass of potato cylinders
2.5	+10
5.0	+8
7.5	+5
10.0	+3
12.5	+1
15.0	-1
17.5	-4
20.0	-6.4
22.5	-8.6
25.0	-11

- (a) Represent the above results in a suitable graph.(08 mks)
- (b) How does the weight of the cylinder vary with salt concentration? (02mks)
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-
-
-
- (c) From the graph determine the salt concentration which is the same as the cell sap of the piece of potato. (01 mk)
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-
- (i) Name the process responsible for the variation in the mass of the potato cylinder with saltconcentration. (01 mk)
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- (ii) Explain briefly how the named process brings about the change in mass of the potato. (03 mks)
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Turn Over 7



- (iii) State three roles of the process named in d(i) above in living organisms. (03 mks)

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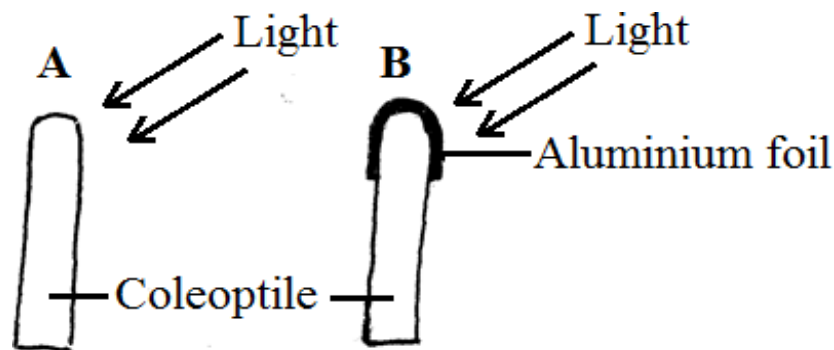
- (iv) What would happen to the potato cylinder if they were placed in 0% salt concentration? (02 mks)

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32. (a) Define **irritability**. (02 mks)

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- (b) An experiment was set up as shown below to investigate the effect of unidirectional light on the growth of a maize coleoptile.



- (i) Explain the response of the plant shoots A and B after exposure to unidirectional light for three days.

Plant shoot A. (02 mks)

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Plant shoot B

(02 mks)

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(ii) Explain the importance of such response to plants.

(02 mks)

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(c) Name other responses that are beneficial to the plants

(02 mks)

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33. (a) Distinguish between the following terms

(i) Incomplete dominance and codominance

(02 mks)

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(ii) Test cross and back cross

(02 mks)

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(b) In a cross between pure breeding grey body mouse and white body mouse, all the F1 offspring had grey body

(i) State which fur colour is controlled by the dominant allele and explain your answer

(01 mk)

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(ii) By using suitable genetic symbols work out the genotypic and phenotypic ratio of F2 generation

(03 mks)

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Turn Over 9

- (c) Mention four applications of genetics (02 mks)

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SECTION C

*Choose any **two** questions in this section.*

- 34 (a) What makes an owl adapted for flight (08mks)
- (b) Describe the action of active flight in birds (04 mks)
- (c) Identify three differences between flight in birds and flight in insects (03mks)
- 35 Sarah's supper often includes boiled eggs, starchy and fried chapattis.
- (a) Describe the events that occur during the digestion of her food (10 mks)
- (b) Describe how the end-products of digestion of her food is absorbed and assimilated. (05 mks)
- 36 (a) What is meant by **double fertilization** as used in plant reproduction? (02 mks)
- (b) Describe the events that lead to double fertilization in flowering plants. (10 mks)
- (c) Outline the changes that follow successful fertilization in flowering plants. (03mks)
- 37 (a) Define water pollution (02mks)
- (b) Describe various ways how man has polluted water bodies (13mks)

END

Turn Over 10