

553/1

Biology

Paper 1

July - August 2023



UGANDA MUSLIM TEACHERS' ASSOCIATION

UMTA JOINT MOCK EXAMINATIONS – 2023

NAME.....

INDEX NO..... SIGNATURE.....

UGANDA CERTIFICATE OF EDUCATION

Biology

Paper one

2 ½ Hours

**INSTRUCTIONS**

- Answer all questions in section A and B, plus two questions from section C.
- Write the answers to Section A in the boxes provided, answers to section B in the spaces provided, and answers to section C must be written in the answer sheets provided.

FOR EXAMINER'S USE ONLY		
Section	Marks	Examiner's signature & No.
A		
B No. 31 No. 32 No. 33		
C No. 1 No. 2		
<b>TOTAL</b>		

**Turn over**

## **SECTION A 30 MARKS**

1. When red flowered peas were crossed with white flowered peas, the F<sub>1</sub> generation were all pink flowered. What would be the result of selfing the F<sub>1</sub> generation?
  - A. All plants would be pink flowered
  - B. 50% of the plants would be pink flowered and 50% red
  - C. 50% of the plants would be pink flowered and 50% white
  - D. 25% of the plants would be red flowered, 50% pink and a 25% white.
  
2. Which of the following conditions increases the rate of transpiration?
  - A. High temperature, high humidity and windy condition
  - B. Low temperature, high humidity and windy condition
  - C. High temperature, low humidity and windy condition
  - D. Low temperature, low humidity and windy condition
  
3. Movement of limbs of organisms in Kingdom animalia is brought about by two sets of muscles that work antagonistically. Which statement best describe upward stroke in insects?
  - A. contraction of elevator flight muscle, relaxation of depressor flight muscle
  - B. relaxation of elevator flight muscle, contraction of depressor flight muscle
  - C. contraction of elevator flight muscle, contraction of depressor flight muscle
  - D. relaxation of elevator flight muscle, relaxation of depressor flight muscle
  
4. Which of the following pairs of organs is important in the digestion of fats?
  - A. Stomach and Lungs
  - B. Pancreas and Liver
  - C. Pancreas and Stomach
  - D. stomach and Mouth
  
5. Which mineral element is important for the formation of chlorophyll?
  - A. Magnesium
  - B. Nitrogen
  - C. Phosphorus
  - D. Sulphur
  
6. Which one of the following is an example of a rhizome?
  - A. Straw berry
  - B. Bryophyllum
  - C. Ginger
  - D. Bulb

7. Which blood vessel carries blood rich in end products of digestion?
- A. Hepatic artery
  - B. Hepatic vein
  - C. Hepatic portal vein
  - D. Renal artery
- 
8. Which one of the following is contained in a colourless food solution which decolourises DCPIP?
- A. Lipids
  - B. Ascorbic acid
  - C. Proteins
  - D. Sugars
- 
9. Which one of the following pairs of parts of the human eye refracts light?
- A. Cornea and choroid
  - B. Aqueous humour and vitreous humour.
  - C. Cornea and Iris
  - D. Iris and Ciliary body
- 
10. A soil sample characterized by good aeration, high drainage, low capillarity and loose particles is:
- A. Clay
  - B. Loam
  - C. Sand
  - D. Laterite
- 
11. Which one of the following is the difference between nervous and endocrine coordination?
- | Nervous                            | Endocrine                        |
|------------------------------------|----------------------------------|
| A. Messages are transmitted slowly | Messages are rapidly transmitted |
| B. Effects are localized           | Effects are widespread           |
| C. Produce long lasting effects    | Produce short lived effects      |
| D. Message is chemical             | Message is electrical            |
- 

**Turn over**

12. Four test tubes, each with contents as indicated in the following table were incubated at a temperature of  $37^{\circ}\text{C}$  for twenty minutes.

Test tube	Contents
1	Albumen + Pepsin
2	Albumen + dilute hydrochloric acid
3	Albumen + pepsin + dilute hydrochloric acid
4	Albumen + boiled pepsin + dilute hydrochloric acid

In which test tube did the contents become clear?

- A. 4
- B. 3
- C. 2
- D. 1

13. The hormones that stimulate the growth of pubic hair in humans are:

- A. Oestrogen and testosterone
- B. Progesterone and luteinizing hormone
- C. Luteinizing hormone and thyroxine
- D. Follicle stimulating hormone and progesterone

14. Which one of the following constituents of blood is not found in the glomerular filtrate?

- A. Urea
- B. Proteins
- C. Water
- D. Glucose

15. Which one of the following describes the change from plant protein to ammonium compounds?

- A. Fermentation
- B. Denitrification
- C. Putrefaction
- D. Nitrification

16. A characteristic feature of a thoracic vertebra is the presence of:

- A. Short transverse processes
- B. Vertebraterial canals
- C. A large centrum
- D. A long neural spine

17. In a mammalian heart, the left ventricle is more muscular than the right because it:
- A. Pumps a lot of blood to the lungs
  - B. Pumps blood to all parts of the body
  - C. Receives blood from all parts of the body
  - D. Receives more blood
18. The growth of a plant shoot towards light is induced by:
- A. Lack of auxins on the dark side
  - B. A higher distribution of auxins on the light side
  - C. A high concentration of auxins at the tip of the shoot
  - D. A higher distribution of auxins on the dark side
19. The significance of secondary growth in plants is increase
- A. Height
  - B. Length
  - C. Thickness
  - D. Strength
20. When a seedling is placed on a Klinostat (Clinostat), no curvature occurs on the shoot because:
- A. auxins are not produced
  - B. growth is accelerated
  - C. auxins are uniformly distributed in the growing parts
  - D. all parts of the seedling are uniformly lit
21. About 90% of Blood plasma is composed of:
- A. salts
  - B. proteins
  - C. water
  - D. amino acids
22. In the process of blood clotting, thrombin acts as an enzyme to bring about conversion of:
- A. fibrinogen to fibrin
  - B. fibrin to fibrinogen
  - C. prothrombin to thrombokinase
  - D. prothrombin to fibrinogen
23. Which of the following organs contain glands which are part of the endocrine system?
- A. Liver, pancreas, heart
  - B. Brain, testes, heart
  - C. Brain, ovaries, heart
  - D. Kidney, heart, liver

24. The following sets of bones are part of the axial skeleton. Which set is correct?
- A. Humerus, ulna and tibia
  - B. Femur, pelvic girdle and skull
  - C. Thoracic vertebra, lumbar vertebra and skull
  - D. Ulna, femur and cervical vertebra
- 
25. Adding humus to sandy soil:
- A. decreases its capillarity
  - B. increases its aeration
  - C. decreases its mineral content
  - D. improves its water retention capacity
- 
26. Which part of the mammalian ear is concerned with balance?
- A. Cochlea
  - B. Semi-circular canal
  - C. Eustachian tube
  - D. Oval window
- 
27. Which one of the following substances is not produced during vigorous exercise?
- A. Water
  - B. Oxygen
  - C. Lactic acid
  - D. carbon dioxide
- 
28. During heavy exercise, a person sweats a lot, what could be the value of sweating? To
- A. get rid of excess water
  - B. get rid of excess salts
  - C. Get rid of excess heat
  - D. get rid of excess nitrogenous waste
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29. Which of the following statements best describes a good mammalian respiratory surface?
- A. Dry with large surface area
  - B. Moist with reduced surface area
  - C. Dry with many blood vessels
  - D. Moist with many blood vessels
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30. Melanin pigment in the skin determines its colour. In which layer of the skin is it found?
- A. Malpighian layer
  - B. Granular layer
  - C. Cornfield layer
  - D. Subcutaneous layer
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## **SECTION B (40 MARKS)**

31. A farmer wanted to plant some Mvule trees on the slopes of Mt. Elgon. The seeds of this tree species however take very long time to germinate. To overcome this delay, he put the seeds in hot water at  $45^{\circ}\text{C}$ .

Groups (batches) of 20 seeds were then removed from the hot water at one minute interval and planted in different nurseries where they were well watered.

After 14 days, he counted the number of seedlings that germinated in each nursery. He recorded the results as shown in the table.

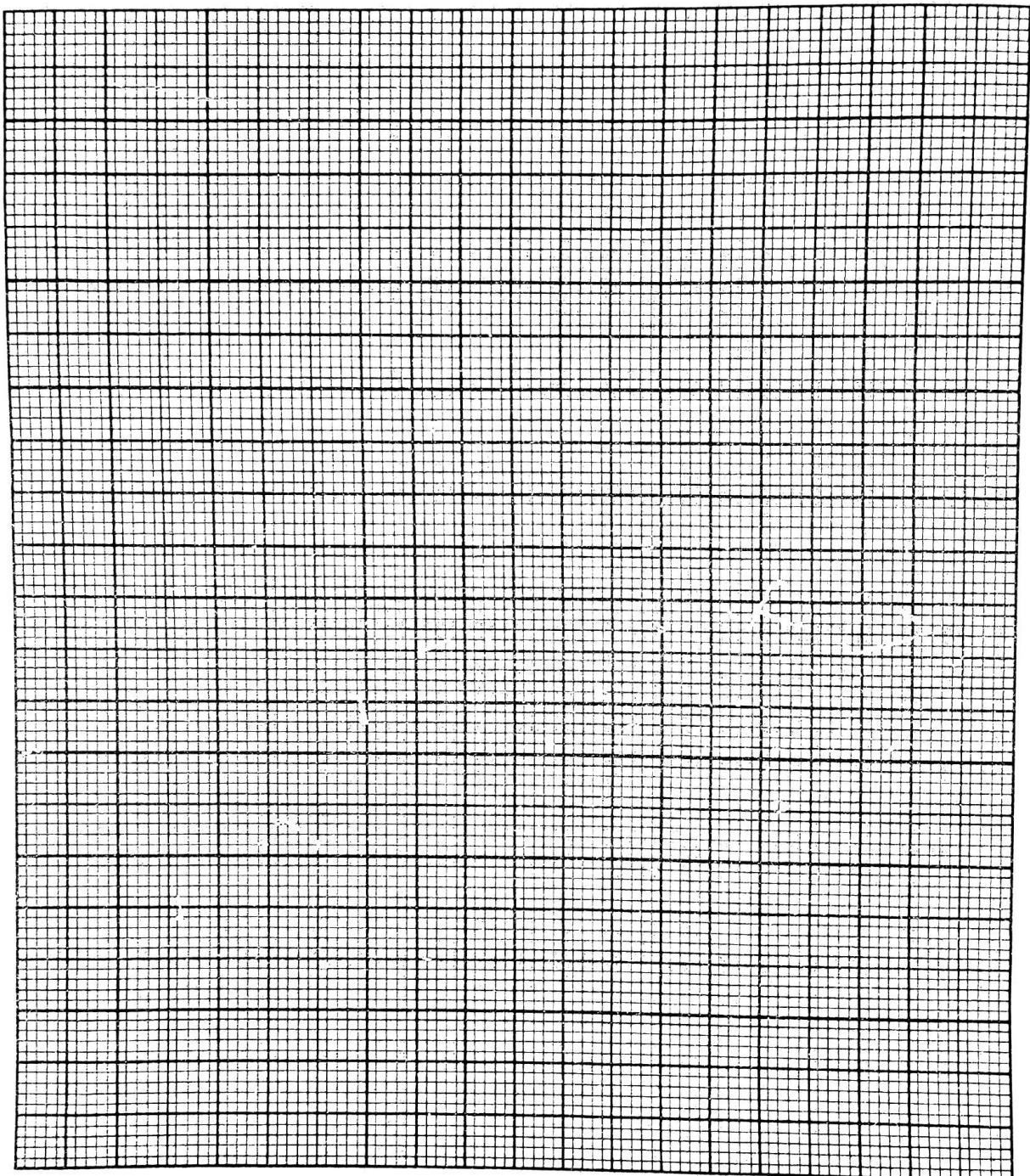
Batch of seeds	Time interval in seconds	Germinated seeds	Percentage germination rate
1 <sup>st</sup>	0	4	
2 <sup>nd</sup>	1	4	
3 <sup>rd</sup>	2	10	
4 <sup>th</sup>	3	17	
5 <sup>th</sup>	4	20	
6 <sup>th</sup>	5	15	
7 <sup>th</sup>	6	12	
8 <sup>th</sup>	7	8	
9 <sup>th</sup>	8	4	
10 <sup>th</sup>	9	0	
11 <sup>th</sup>	10	0	

- a. Calculate the percentage germination rate for each batch. Record in the column above.

(4 marks)

**Turn over**

- b. Use the results of your calculation to plot a graph of percentage germination against time taken to soak the seeds. (5 marks)



c. How many seeds would germinate if they were soaked or 5.5 minutes. (2 marks).

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d. Give reasons for the seeds failing to germinate after being soaked 9 to 11 minutes. (4 marks).

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e. (i). What could have prevented the seeds from germinating before being soaked? (2 marks).

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(ii). What other method, besides hot water treatment, could be used to increase the rate of germination? (1mark).

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f. State any other three causes of seed dormancy. (3 marks).

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32. The pancreas is both an endocrine and exocrine gland.

(a). State two differences between endocrine and exocrine gland (02 marks)

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(b) Explain the function of the pancreas as

(i) An endocrine gland (04 marks)

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**Turn over**

(ii) An exocrine gland.

(4 marks)

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33. a). One of the components of soil is soil living organisms. Lack of soil living organism makes soil infertile. Explain this phenomenon. (4 marks)

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b). How does each of the following make the soil infertile:

(i). leaching.

(3 marks)

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(ii). Monoculture.

(3 marks)

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### **SECTION C (30 MARKS)**

- 34.(a). State two requirements and two conditions for photosynthesis. (2 marks)
- (b). The primary function of a leaf is to carry out photosynthesis. How does the structure of a leaf suit this function? (13 marks)
35. (a). With an example in each case, state the different types of skeletons in animals. (3 marks).
- (c) Apart from support and locomotion; state any other two of skeletons in animals. (2 marks)
- (c). Describe how wings are moved up and down during flight in a bird. (10 marks).
36. (a). Describe the mechanism of:
- (i). Inspiration: (7 marks)
- (ii). Expiration in a bony fish (4 marks)
- (b). How are gills adapted for gaseous exchange in a bony fish? (4 marks)
37. (a) State the differences between a motor and sensory neuron. (4 marks)
- (b) Timothy walking bare feet unknowingly stepped on a pin. He quickly lifted his leg.  
Describe how Timothy's response is brought about. (11 marks)

**END**