553/1

Biology

Theory

PAPER 1

July 2022

$2\frac{1}{2}$ Hours

KAMOTA MOCK EXAMINATIONS 2022

UGANDA CERTIFICATE OF EDUCATION

BIOLOGY

Paper 1

2 hours: 30 minutes

INSTRUCTIONS TO CANDIDATES

- Answer all questions in section A and B plus two questions from section C
- Write the answers in section A in the boxes provided, answers to section B in the spaces and answers to section C in the answer booklet provided.

FOR EXAMINERS USE ONLY		
SECTION	**MARKS**	**EXAMINERS SIGNATURE**
A:		
B: No: 31		
No: 32		
No: 33		
C: No:		
No:		

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

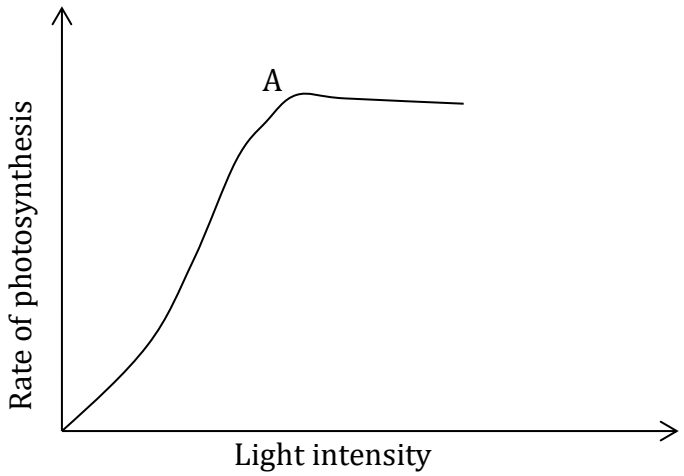
1. Which of the following is important for the formation of strong bones and teeth in human beings?

   A. Iron and vitamin C
   B. Iron and calcium
   C. Vitamin C and iodine
   D. Vitamin D and calcium

2. Which one of the following is NOT a characteristic of blood capillaries?

   A. They have thick walls
   B. They have very thin walls
   C. They have a large surface area
   D. Blood flow through them ve slowly

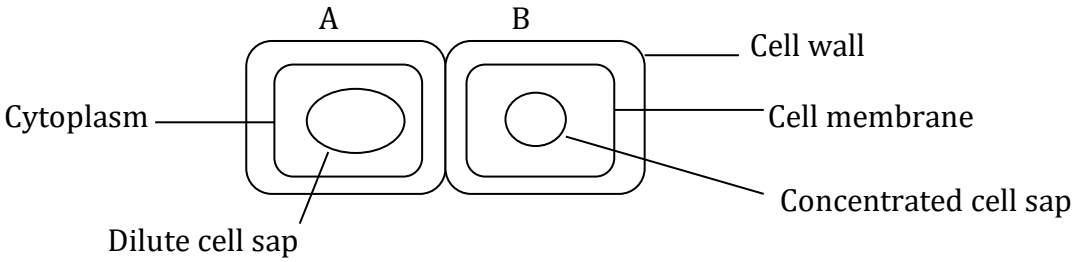
3. The figure below shows the effect of light intensity on the rate of photosynthesis.



   Which of the following is the most likely limiting factor of the rate of photosynthesis at A?

A. Carbon dioxide concentration
B. Light intensity
C. Chlorophyll content
D. Water

4. Which one of the following activities does not contribute to the greenhouse effect?
   A. Deforestation
   B. Use of chlorofluorocarbon
   C. Burning of fossil fuel
   D. Emission of gases from industries
5. The figure below shows two plant cells in contact.



   Which of the following describes the movement of water by osmosis between the two cells?
   A. Water will move from cell A to B
   B. Water will move from cell B to A
   C. There is no net movement of water
   D. Water moves out of the cells to the outside
6. Air is drawn into the lungs when;
   A. The volume of the thoracic cavity in low
   B. The pressure in the lungs is low
   C. The diaphragm is relaxed
   D. Intercostals muscle are relaxed
7. Which one of the following features distinguishes the insects from other arthropods?

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

A. Pointed legs
C. Two pairs of wings
B. Three main body parts
D. A pair of antennae

8. Which one of the following occurs during inter phase in mitosis?
   A. Division of the nucleus into two portions
   B. Construction of the cytoplasm
   C. Duplication of genetic material
   D. Arrangement of chromosomes on the spindle

9. During swimming in a fish, the caudal fin controls,
   A. Pitching
   C. Sinking
   B. Rolling
   D. Forward movement

10. Which one of the following arthropods has an incomplete metamorphosis?
   A. Aphids
   C. Mosquitoes
   D. Bee
   B. Blow fly

11. If a man of blood type A marries a woman of blood type B and they have a child of blood type AB. Which one of the following statements is true?
   A. No blood transfusion between members of the family is possible.
   B. The mother could donate blood to the father but not the child.
   C. The child could receive blood from the father and the mother.
   D. The child could donate blood to the father and the mother.

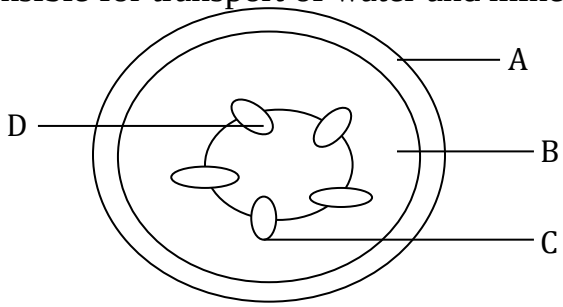
12. Which of the following hormones is concerned with water balance in human body?
   A. Insulin
   C. Thyroxine
   B. Glucagon
   D. Anti diuretic hormone

13. Guard cells unlike other epidermal cells;
   A. Contain air spaces
   B. Are columnar shaped

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

C. Contain chloroplasts D. Possess a nucleus

14. Which part of the diagram of the transverse section of the stem shown below is responsible for transport of water and minerals in a plant?



15. $20cm^3$ of the soil was poured in the measuring cylinder. $50cm^3$ of water was added and the mixture was stirred. The volume of the mixture was $68cm^3$. What was the percentage of air in the soil sample?

A. 2% B. 10% C. 20% D. 30%

16. The eggs of birds are larger than those of mammals because the bird's eggs;

A. Provide more nutrients to the developing embryo

B. Have the protective shells

C. Are laid after fertilization

D. Are eaten by mammals

17. Which one of the following conditions would lead to the formation of dilute urine?

A. Little water intake and release of little ADH into the blood stream

B. Sweating and release of more ADH into the blood stream

C. Intake of much salt and release of more ADH into the blood stream

D. Much water intake and release of little ADH into the blood stream

18. The common products of aerobic and anaerobic respiration in plants are;

A. Water and alcohol B. Energy and carbon dioxid

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

C. Lactic acid and water
D. Lactic acid and alcohol

19. One advantage of artificial fertilizers over organic fertilizers is that;

A. Are readily available
C. Cheap
B. Easily leached from soil
D. Less bulky

20. Which one of the following is an example of discontinuous variation among male humans?

A. Blood groups
C. Height
B. Skin colour in one race
D. Body mass

21. Which one of the following features describes the thoracic vertebra?

A. Short neural spine and long transverse process
B. Long neural spine and short transverse process
C. Short neural spine and short transverse process
D. Long neural spine and long transverse process

22. The role of the luteinizing hormone is to;

A. Cause ovulation
B. Thicken the uterine wall
C. Cause development of the grafian follicle
D. Maintain pregnancy

23. Which one of the following is a result of increased levels of adrenaline in the body?

A. Increased uptake of glucose by the liver
B. Decrease in the rate of breathing
C. Reduction in metabolic rate
D. Increased rate of heart beat

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

24. Cystic fibrous is a genetic disorder caused by a recessive allele. If a man who is a carrier marries a woman who is a carrier, what would be the chance of their child having cystic fibrosin?

A. 25%
C. 75%
B. 50%
D. 100%

25. Which one of the following is caused by protozoa?

A. Cholera
C. Malaria
B. Influenza
D. Candida

26. Which one of the following differences between wind pollinated flowers and insect pollinated flowers match?

	Wind pollinated flowers	Insect pollinated flowers
A	Flowers are brightly coloured	Flowers are dull coloured
B	Pollens are heavy and often sticky	Pollens are light and small
C	Flowers odourless	Flowers scented
D	Stigma usually small and simple	Stigma large and feathery

27. Soil erosion of gentle slope can be best controlled by;

A. Contour ploughing, terracing and mulching
B. Application of fertilizers, mixed cropping and deep ploughing
C. Deep ploughing, planting cover crops and adding manure
D. Fallowing; mixed cropping and adding manure.

28. Which one of the following structure has a dual function of producing enzymes and hormones?

A. Kidney
C. Ovary
B. Thyroid gland
D. Pancreas

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

29. The role of dilute hydrochloric acid added to a solution when testing for non – reducing sugar is to;

A. Neutralize the solution

B. Provide a suitable medium for benedicts reagent

C. Hydrolyse the no – reducing sugars

D. Kill the bacteria in the test solution

30. The importance of phototropism in plants is to enable;

A. Plants grow towards mineral salts and water

B. Climbing plants to grow on their support

C. Plants in the shade to grow faster and get exposed to light

D. Plant roots gain good anchorage

`

SECTION B

Write the answers in the spaces provided.

31. A group of S.4 students peeled off the scale leaves of small onion bulbs and divided the bulbs into 6 batches of 10 onions bulbs and weighed. Mean mass of onion bulbs in each bath was calculated. The onion bulbs were later soaked in different concentrations of sodium chloride solutions. After three hours, the onion bulbs were removed from the solution, surface dried with paper towels and reweighed. The results are shown in the table below.

	Mean mass of onion bulbs

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

Concentration of Sodium chloride solution (g/dm^3)	Before soaking	After soaking	Percentage change in mass
0	147	173	
25	153	165	
50	176	172	
100	154	149	
150	149	142	
200	185	175	

(a) Calculate the percentage change in the mass of onion bulbs for each of the solutions. (3 marks)

(b) Plot a graph to represent the change in mass of onion bulbs against the concentration of sodium chloride solution. (6 marks)

(c) From the graph, determine the salt concentration at which no net movement of water occurs. Explain your answer.

(2 marks)

……

……

……

……..……

……

……

……

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

……..

……..

(d) Explain the effect of the concentration of sodium chloride on the percentage change in mass of onion bulbs.

(5 marks)

……

……

……

……

……

……

……

…

……

……

……

……

(e) State 4 biological values of the process responsible for the variation of the mass of onion bulbs with the salt concentration to living organisms

(4 marks)

……

……

……

……

……..

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

……

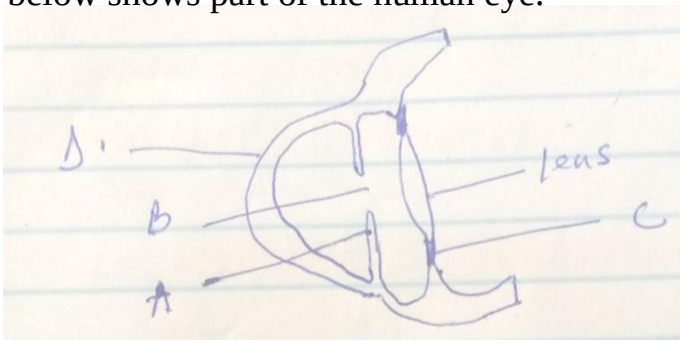
……

……

……

……..

32. The figure below shows part of the human eye.



(a) Name the parts labeled A, B, C and D (2 marks)

A:

……

……

B:

……

……

C:

……

……

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

D:

……

……

(b) What is the function of part B? (1 mark)

……

……

……

(c) If a person entered a room which is well lit from darkness, state the changes that would occur in each of the parts A and B of the eye.

(3 marks)

……

……

……

……

……

……

……

(d) (i) In the space below, draw diagrams to show the difference in the shape of the lens when the eye is focusing on the near and distant objects respectively.

(2 marks)

……

……

……

……

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

……

……

……

……

……

……

……

(ii) Briefly explain the differences in the shape of the lens shown in (d) (i) above.

(2 marks)

……

……

……

……..……

……

……

……

……

33. (a) Distinguish between a back cross and test cross. (2 marks)

……

……

……

……

……

……

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

……

……

……

(b) (i) Albinism in man is caused by a recessive allele. A woman who is a carrier for albinism is married to a homozygous normal man. Using suitable symbols, work out the possible genotypes and phenotypes of their children.

(6 marks)

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

……

……

……

(ii) Determine the chance that the couple will produce an albino. (2 marks)

……

……

……

……

SECTION C

34.(a) Explain how the following are adapted to their function. (8 marks)

(i.) Root hairs

(ii.) Guard cell

(iii.) Palisade metophyll

(b) Describe how the opening and closing of the stomata in land plants occurs. (7 marks)

35.(a) Compare the life cycle of a cockroach and a house fly. (5 marks)

(b) Describe the life cycle of a house fly. (8 marks)

(c) State the economic importance of house fly. (2 marks)

36.(a) Giving one example in each case, explain what is meant by;

(i.) Renewable resources

(ii.) Non-renewable resources

(iii.) Inexhaustible resources (6 marks)

(b) (i) Explain the effects of charcoal burning to the environment. (5 marks)

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com

(ii) Suggest remedies to the effects of charcoal burning to the environment.

(4 marks)

37.(a) How is soil air important to plants? (3 marks) (b) Describe an experiment to determine the percentage of air in a soil sample.

(12 marks)

END

"Quality Assessment For Academic Excellence And Integral Development"
KAMOTA CONTACTS: +256-775-569-303 / +256-759-495-702, EMAIL: kamota256@gmail.com