Name:.....Centre/Index No:...../.....

553/1
BIOLOGY
THEORY
Paper 1
DECEMBER, 2020
2½ hours

JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

MOCK EXAMINATIONS DECEMBER, 2020

BIOLOGY

THEORY

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Answer **ALL** *questions in section* **A** *and* **B**, *plus any* **TWO** *questions in section* **C**.

Answers to section **A** *and B* should be written in the spaces provided strictly.

For Examiner's Use Only

SECTION	MARKS
A: 1-30:	
B No. 31:	
No. 32:	
No. 33:	
C No. :	
No:	
TOTAL	

Section A. (30 Marks)

1. The type of leaf modification exhibited by leaves of a cactus plant is for .....
   A. support.
   B. protection.
   C. defense.
   D. capturing insects.
2. The importance of photosynthesis by aquatic plants to water organisms is to...
   A. reduce carbon dioxide from water at night.
   B. absorb oxygen for respiration.
   C. produce oxygen in water.
   D. manufacture food for the plant.
3. Which of the following is not a correct comparison between a camera and an eye? Both .....
   A. are not enclosed.
   B. are black inside.
   C. use a converging lens to focus.
   D. control amount of light entering.
4. Which of the following occurs during breathing in man?
   A. Intercostal muscles relax.
   B. Thoracic cavity becomes smaller.
   C. Diaphragm contracts and flattens out.
   D. Lungs shrink.
5. The following feature does not apply to all respiratory surfaces.
   A. Have a large surface area
   B. Well supplied with blood vessels.
   C. They are kept moist.
   D. Are only one or two cells thick.
6. The table below shows comparison of a human and cow's milk

Content	Human milk per 100g	Cow's milk per 100g
Water	88g	88g
Proteins	1.2g	3.3g
Fats	3.5g	3.5g
Milk sugar	6.5g	4.7g
Ascorbic acid	4.8mg	7.3mg

Which of the substances deficient in a cow's milk compared to human milk is essential for energy?.
   A. Proteins.
   B. Ascorbic acid.
   C. Fats.
   D. Milk sugar.
7. Poor development of bones and teeth is due to lack of

A. vitamin A B. Vitamin D C. Vitamin B_2 D . Vitamin E

8. The deficient hormone in a person who was found to be passing out a lot of urine but without sugar in it and complaining of thirst most of the time is

A.Pancreatic juice B. glucagon C. Insulin D. anti-diuretic hormone

9. Which of the following is the part of the eye responsible for regulating the size of the pupil?

A. Iris B. Ciliary muscle C. Eye lens D. Suspensory ligament

10. When the scapula joins the humerus in humans the joint formed is

A. hinge joint B. immovable joint C. pivot joint D. ball and socket

11. The liver is referred to as the most diversified organ in the body because it

A. is the largest organ in the body with 2.5 kg.

B. Produces bile that emulsifies fats.

C. Stores the largest volume of blood.

D. performs a variety of processes compared to other organs

12. Which of the following conditions would cause the adrenal glands of a man to produce a hormone?

A. Eating a bitter fruit. B. Hearing a song.

C. Seeing a fierce dog. D. Smelling a flower.

13. Which of the following is the least important function of humus in the soil?

A. Improving aeration B Water retention

C. prevention of soil erosion D. increasing soil fertility

14. During a respiratory investigation in man , the following results were obtained

$C_6H_{12}O_6 + 6O_2 \longrightarrow 6C0_2 + 6H_20$ +Energy

The respiratory quotient is

A. 0.7 B. 1.0 C. 0.5 D. 1.2

15. Which of the following is not a homeostatic function of blood?

A. Carriage of waste products from tissues to the kidney.

B. Carriage of oxygen from the heart to all tissues.

C. Regulation of blood temperature.

D. Maintenance of water content of the body.

16. Guard cells differ from other epidermal cells because they

A. contain chloroplasts. B. do not become turgid.

C. are flabby at all times. D. allow stomatal opening permanently

17. A simple aquatic organisms which reproduce asexually by vegetative reproduction and sexually by conjugation is

A Paramecium B Amoeba C Spirogyra D Crab

18. Which one of the following is common to fish, birds and reptiles?
A. They use their nostrils for breathing.
B. Their fertilization is external.
C. They are poikilotherms.
D. They have scales.
19. Which of the following comparisons between insect and wind pollinated flowers is not true?

Wind pollinated	**Insect pollinated**
A. Flowers not brightly coloured	Flowers brightly coloured.
B. Pollen light and small	Pollen heavy and often sticky.
C. Flowers odourless	Flower scented.
D. Stigma usually small and simple	Stigma large and feathery.

20. Bile salts are useful in the digestion of fats by
A. neutralizing excess stomach acids.
B. converting fats into simpler substances.
C. breaking fats into smaller particles.
D. separating fatty acids from glycerol.
21. Removal of a ring of a bark from a tree trunk interferes with the movement of
A. Carbon dioxide to the leaves B. water to the leaves
C. mineral salts to the roots D. food to the roots.
22. The habitat of a plant with many stomata on the upper surface of the leaves is most likely to be
A. water B. salty mash C. desert D. high altitude
23. A non-structural adaptation of leaves to reduce water loss by transpiration is
A. having hairy lamina B. a waxy cuticle
C. presence of thin lamina D. presence of sunken stomata
24. Which of the following is a pair of enzymes contained in the juice secreted by the Pancreas during digestion?
A. Maltase and sucrase B. Trypsin and amylase
C. Peptidase and lactase D. Amylase and pepsin
25. Presence of thick walls which are muscular and elastic in arteries is due to their ability to
A. withstand surges of high blood pressure.
B. allow a wide volume of blood flow.
C. enable substances to pass easily.
D. facilitate a large volume of blood flow.
26. Excretory wastes in insects are eliminated from their bodies through
A. kidney tubule B. contractile vacuole
C. malphigian tubule D. nephridium

27. Which of the following substances does not appear in urine because of its large size of molecules?

A. Glucose B. Sodium C. Plasma protein D. Water

28. The larva of a culex mosquito can be distinguished from that of anopheles' mosquito larva by

A. lying at an angle in water.
B. clustering together in water.
C. lying parallel to the surface of water.
D. breathing through a pair of spiracles.

29. Herbivorous animals rely on bacteria living in their alimentary canal because bacteria

A. enzymes break down cellulose to provide energy.
B. store cellulose for the animal.
C. contain enzymes which store starch.
D. live in a suitable environment in the herbivores.

30. When a strip of a young pawpaw stalk is placed in distilled water it will curl out wards because the cells

A. lose water by osmosis and turgidity increases.
B. absorb water by osmosis and become flaccid.
C. absorb water by osmosis and their turgor increases.
D. lose water by osmosis and become flaccid.

SECTION B (40 Marks)

Answer **all** questions in this section.

31. The table below shows the percentage composition of inhaled and exhaled air in a human being at rest and also exhaled air during exercise. Use it to answer the questions that follow

Type of air	**Water**	**Nitrogen**	**Oxygen**	**Carbondioxide**
Inhaled air at rest	variable	79%	21%	0.03%
Exhaled air at rest	8%	79%	17%	4.0%
Exhaled air during exercise	92%	79%	16.2%	4.3%

a) State the differences in composition between inhaled air and exhaled air at rest

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..... (03marks)

b) Give a reason for each difference stated in (a above.

..... (04 marks)

c) State the changes that occur in the composition of exhaled air in a human being who is previously at rest than at exercise

..... (03marks)

d) Give a reason why each change stated above occurs.

..... (04marks)

e During exercise the breathing rate increases. From the information provided, suggest why this happens.

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..... (04 marks)

f Why is the percentage of nitrogen constant in both exhaled and inhaled air

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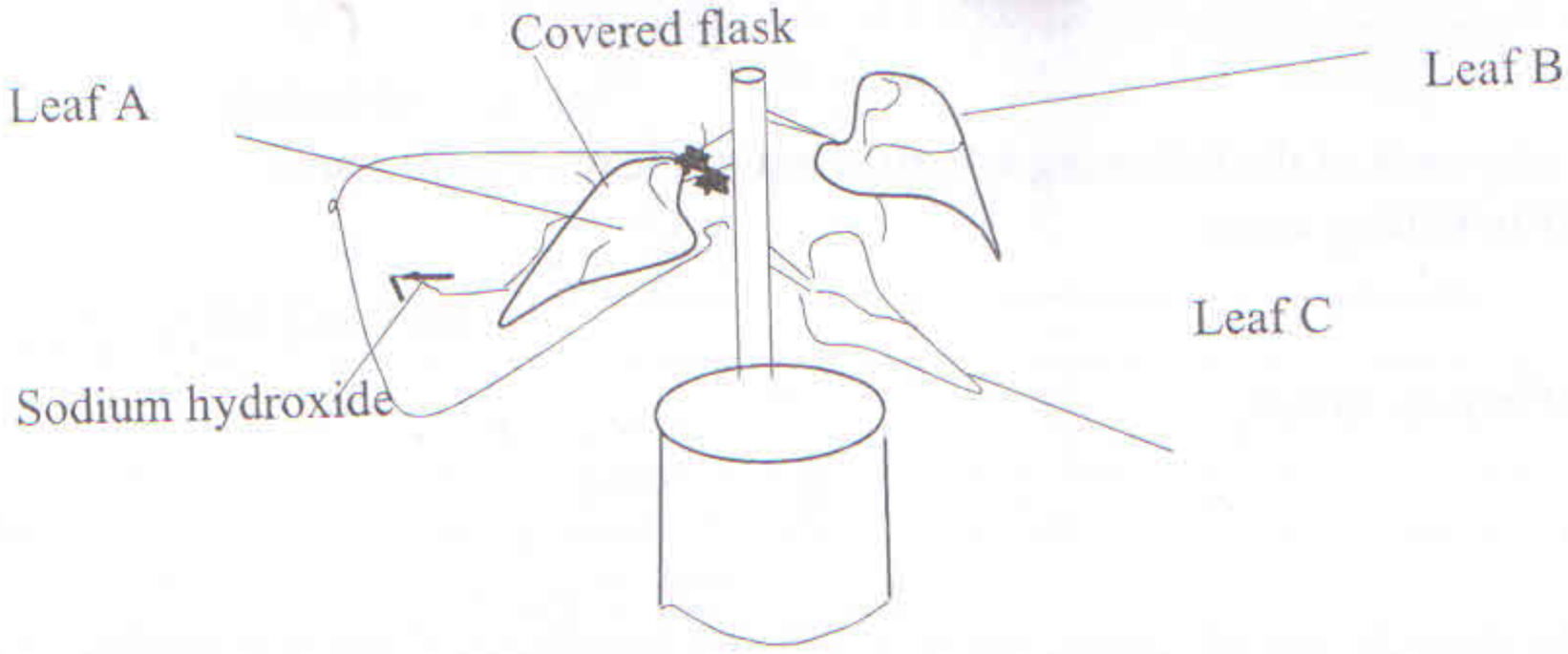
..... (02 marks)

32. To investigate the effect of carbondioxide on photosynthesis, a green plant was destarched by leaving it in darkness for 24hrs. After destarching, leaf **A** was placed in a conical flask while leaf **B** was tested immediately for starch. The set up was then left in light for 8hrs after which leaf **A** and **C** were tested for starch.



(a) Why was sodium hydroxide used in this experiment?

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(01mark)

(b) Explain why the plant leaves become destarched when placed in darkness for 24hrs.

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(02 marks)

(c) What was the purpose of each of the leaves **B** and **C** in the experiment?

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.....(02mrks)

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(d) What was observed when each of the leaves **A, B, C** were tested for starch?

(i) Leaf A .....

(ii) Leaf B .....

(iii) Leaf C .....

(03mrks)

(e) Give a reason why each of the following is carried out-while testing for starch

(i) Placing a leaf in boiling water.

..... (01 mark)

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(ii) Putting a leaf in hot ethanol.

..... (01mark)

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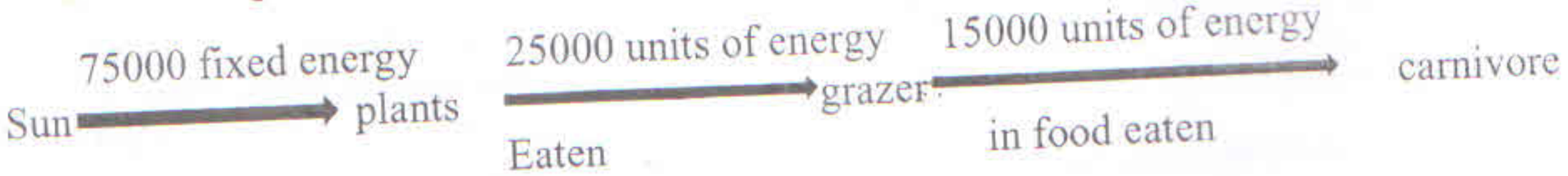
33. In a food chain there is loss of energy when it is being transferred from one trophic level to another. Fig 1 indicates how such a transfer of energy in and out of an organism is achieved.



a) Name the trophic levels shown in the figure

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.....producer.....

.....primary consume.....

.....Secondary consume.....

..... (01mk)

b) State two ways in which energy is lost from the carnivore.

.....through excretion.....

.....Through locomotion.....

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..... (01mks)

c) Calculate the percentage of energy taken in during the year.

(i) By the grazer

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$\frac{25000}{75000} \times 100$

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.....33.33%.....

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(ii) By the carnivore

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$\frac{15000}{25000} \times 100\%$

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.....60%.....

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..... (03mks)

(iii) In proportion to its body, the curb has more energy to maintain its body temperature than the mother. Explain why this is so

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.....(02marks)

(iv) In the recycling of materials how can the energy within the carnivore be made available to the producers.

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..... (02 marks)

SECTION C (30 marks)

Attempt any *two* questions from this section.

34. In humans the blood circulatory and lymphatic system transports body fluids

a) Outline the functions of the lymphatic system. (04 marks)

b) Explain the changes that occur in the composition of blood as it passes through the capillaries of the following parts of the body.

(i) Lungs (03 marks)

(ii) Liver (05 marks)

(iii) Kidneys (03marks)

35. During an investigation on a soil sample the following information was obtained:

Thirty grams of soil was placed in a crucible weighing eight grams. The soil was heated at 105^0C to a constant mass of 32 grams. The soil was heated to red hot and 24 grams were obtained after cooling.

(a) Calculate the percentage of humus and water in this soil sample. (05 marks)

(b) State the importance of living organisms in the soil. (04marks)

(c) Explain how the soil fertility is lost. (06marks)

36. (a) What are wetlands? (02marks)

(b) In which ways (i) are wetlands of economic importance? (07marks)

(ii) have wetlands been affected by man? (06marks)

37. (a) Describe the structural adaptation of the mammalian heart to its functions. (10 marks)

(b) State five differences between arteries and veins (05marks)

 End.