Name: ..... **Signature:** .....

Personal number: [ ][ ][ ]

553/1
BIOLOGY
(Theory)
Paper 1
July. /Aug. 2022
2 ½ hours

NAMIREMBE DIOCESE COUHEIA SECONDARY MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

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 to Section **A** in the boxes provided, answers to section **B** in the spaces provided, and answers to Section **C** in the answer sheets provided.*

FOR EXAMINERS' USE ONLY		
Section	**Marks**	**Examiner's Signature and No.**
A:		
B: No. 31		
No. 32		
No. 33		
C: No.		
No.		
Total		

SECTION A

1. The following are structures of a cell

i. Cell wall
ii. Nucleus
iii. Cell membrane
iv. Chloroplast

A. (i), (ii) and (iv)
B. (i), (iii) and (iv)
C. (ii) and (iii)
D. (iv) and v

2. The distinct group of cells of a similar and special structure performing a particular function is called.....

A. Organ
B. Tissue
C. System
D. Organ system

3. Which one of the following sets of organisms belong to the same group?

A. Butterfly, beetle and starfish
B. Crab, tape warm and liver fluke
C. Scorpion, mite and spider
D. Jelly fish, slug and sea urchin

4. Which one of the following characteristics is common to birds, fish and reptiles?

A. Regulation of body temperature
B. Bodies are covered with scales
C. Use nostrils for breathing
D. Internal fertilization

5. Which one of the following plant organs can be used in vegetative reproduction?

A. Stem tuber of Irish potato
B. Root tube of cassava
C. Tap root of a carrot
D. Leave of an onion

6. Which one of the following types of fruits is a pineapple?

A. Drupe
B. Multiple fruit
C. Indehiscent fruit
D. Berry

7. Which one of the following is not primary function of roots?

A. Conduct water and mineral salts
B. Anchor the plant into soil
C. Store food and water
D. Absorb water and mineral salts

8. Which one of the following activities take place during the pupal stage in the life cycle of an insect?

A. Hibernation
B. Organ formation
C. Feeding
D. Resting

9. Which of the following farming practices would control soil erosion?

A. Application of artificial fertilizers
B. Addition of compost manure
C. Terracing
D. Mixed farming

10. Which one of the following organisms improve aeration and drainage of soil

A. Fungi
B. Snails
C. Bacteria
D. Termites

11. Beans are usually included in crop rotation cycle because, they

A. Act as cover crops
B. Improve water retention of the soil
C. Increase humus content in the soil
D. Restore nitrogen in the soil

12.To identify substance, a student performed the following experiments

	Test	Observation
(i)	Heated Y with benedict solution	Solution remained there
(ii)	Heated Y with dil Hcl cooled added dil NaOH Benedict solution and boil	Solutions turned from blue to orange.

From the observations, the most likely food substrate in Y is

A. Starch
B. Maltose
C. Sucrose
D. Glucose

13. Lack of proteins in the diet of a child is responsible for

A. Kwashiorkor
B. Marasmus
C. Pellagra
D. Rickets

14. Enzymes are said to be specific in nature because they

A. are proteins
B. act in a particular PH medium
C. act on one kind of substrate
D. remains unchanged at the end of the experiment

15. Which of the following processes need energy?

A. Osmosis
B. Diffusion
C. Plasmolysis
D. Active transport

16. Which of the following takes place by the process of active transport in plants?

A. Uptake of water
B. Intake of carbondioxide
C. Transpiration
D. Uptake of mineral salts

17. Which one of the following reactions is likely to occur when a donor of blood group A gives blood to a recipient of blood group B?

A. Antibodies a react with antigen A
B. Antigens B react with antibodies b
C. Antibodies b react with antigens A
D. Antigens a react with antigens B

18. Which one of the following is not transported in blood?
A. Amylase
B. Urea
C. Insulin
D. Sodium chloride

19. What are the final products of aneabic respiration?

A. CO_2, water and energy
B. CO_2, water and alcohol
C. CO_2, alcohol and energy
D. CO_2, and alcohol

20. Under which one of the following conditions will air enter the mammalians lungs? When

A. Pressure of the thorax is increased
B. Ribs are lowered
C. Inhalation occurs
D. Volume of the thorax is increased

21. Which one the following excretory products are removed from the body by kidney?

A. Urea, excess water and excess salts
B. Urea, excess water and carbondioxide
C. Carbondioxide, excess water and excess salts
D. Carbondioxide, urea and excess salts

22. Which of the following is not a function of the liver?

A. Storage of vitamins
B. Manufacture of plasma protein
C. Storage of proteins
D. Formation of bile

23. In which of the following are the largest amount of nitrogenous wasted excreted?
A. Urine
B. Sweat
C. Breath
D. Faeces

24. Which of the following sets of events occurs in a person when feeling cold?

A. Blood capillaries constrict, hair rises and metabolic rate increases
B. Hair lowers, blood capillaries dilate and metabolic rate decreases
C. Metabolic rate decreases, blood capillaries dilate and hair lowers
D. Metabolic rate decreases, blood capillaries constrict and hair rises

25. Which of the following describes the carrying capacity of a population?

A. Maximum number of organisms that can produce freely in a habitat
B. Area occupied by organisms of different species
C. Maximum number of organisms that can be supported by a specific area
D. Maximum number of plants that can support animals in a given area

26. A population in equilibrium would be characteristic of natural community in which
    A. Pioneer organisms are increasing rapidly
    B. Immigration is occurring rapidly
    C. The pyramid of energy has been reversed
    D. Succession has reached a climax

27 Which of the following is true about nastic responses?
    A. Depends on the direction of the stimuli
    B. Does not involve hormones
    C. It is relatively slow
    D. Does not involve any growth

28. Which one of the following sets consists of hormones produced by mammalian reproductive organ?
    A. Follicle stimulating hormones and testosterone
    B. Progesterone and testosterone
    C. Oestrogen and luteinising hormones
    D. Follicle stimulating hormone and oestrogen

29. Which one of the following vertebra provide point of attachment to the ribs?
    A. Cervical
    B. Thoracic
    C. Lumber
    D. Sacrum

30. In cattle the gene for red coat colour R, is co-dominant to that for white coat colour, if a red cow was mated to a white bull, what would be the phenotype of the F_1 generation?
    A. All red
    B. All white
    C. 3 red: 1 white
    D. Intermediated coat colour

SECTION B

31. Table shows the body surface area and volume of two land animals A and B.

Animal A has, surface area = $1.2m^2$

Volume = $0.92m^3$

Animal B has, surface area = $0.6m^2$

Volume = $0.18m^3$

Table

Environmental temperature	Metabolic rates (Arbitrary units)	
^oC	Animal A	Animal B
16	10.5	12.9
18	8.9	10.9
20	7.5	9.2
22	6.4	7.8
24	5.6	6.7
26	5.0	5.8

(a) Calculate the surface Area to volume ratio for each Animal and give its implication.

(i) Animal A. $(02\frac{1}{2}\ marks)$

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.....

.....

.....

(i) Animal B $(02\frac{1}{2}\ marks)$

.....

.....

.....

(b) Plot on the same graph the metabolic rate of the two animals against environmental temperature. $(06\ marks)$

31(c) From your graph determine the metabolic rate of each animal at environmental temperature of 25°C. (01 *mark*)

Animal A .....

Animal B .....

(d)(i) How does environmental temperature affect the metabolic rate of animals. (04 *marks*)

A.....

B.....

(ii)Explain how the variation of temperature affects the metabolic rate of animals as stated in c(i) (04 *marks*)

.....

32(a) In cattle, the gene for hornless condition is dominant over the one for horned condition. A cow homozygous for hornless condition was mated to horned bull. Using symbols, show the possible genotype and phonotypes of F_1 offsprings. (04 *marks*)

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(b)(i) A bull whose horns were removed was mated to a horned cow. Show the possible genotypes and phenotypes of the F_1 offsprings. (04 *marks*)

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(ii)Give a reason for your answer in (b) above. (02 *marks*)

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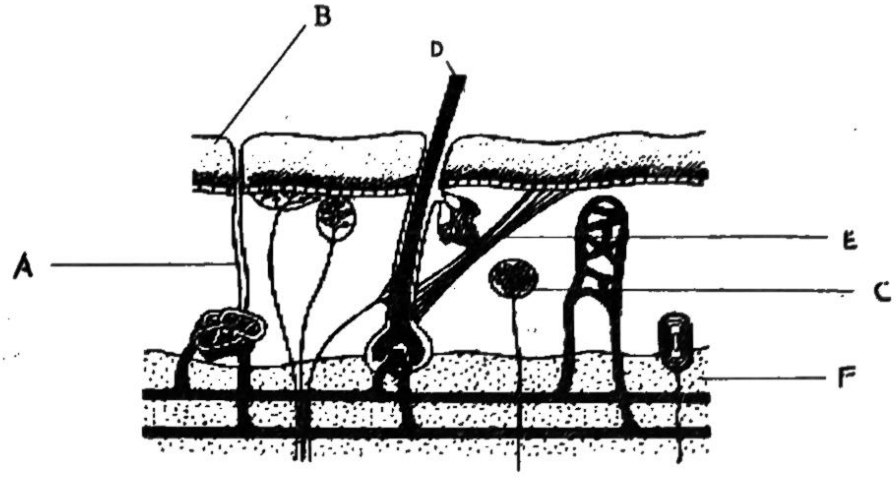
32. The fig below shows alongitudinal section of a human skin.



(a)(i) Name the parts labelled A to F. (03 *marks*)

A. ..... D. .....

B. ..... E. .....

C. ..... F. .....

(ii) State the function of each of the parts labelled. (06 *marks*)

A .....

B.....
...

D .....

F
.....

(b)Using any one observable feature on the diagram, suggest the type of temperature condition that is being responded to. (01 *mark*)

.....

SECTION C

34(a) Outline the adaptations of the following structures of a plant leaf to their Functions:

(i) Palisade mesophyll layer (04 marks)
(ii) Spongy mesophyll layer (04 marks)
(iii) Endodermal layer (04 marks)

(b)Describe the modification of leaves of plants growing in hot areas. (03 marks)

35(a) Describe the structure of a motor neurone (08 marks)
(b)(i) what is meant by reflex action. (02 marks)
(ii) By means of a diagram shown the path followed by a nerve impulse during a reflex action, (05 marks)

36(a) What is meant by environmental pollution? (02 marks)
(b) Explain how the continued use of polythene paper may harm the environment (10 marks)
(c) Suggest any three ways of preventing the effects suggested in (b) above (03 marks)

37(a) Differentiate between sexual reproduction and asexual reproduction. (02 marks)
(b)Describe the process of sexual reproduction in Rhizopus (10 marks)

(c)Explain any three advantages of sexual reproduction. (03marks)

END

Name..... Signature: .....

PERSONAL NO:.....

553/2
BIOLOGY
PRACTICAL
Paper 2
2 hours

NAMIREMBE DIOCESE COUHEIA SECONDARY MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY PRACTICAL
Paper 2
2 Hours

INSTRUCTIONS TO CANDICATES
This paper consists of **three** questions
Answer **all** questions
Drawings should be made in the spaces provided
Use **sharp pencils** for your drawings

For Examiners Use Only

Question	Marks	Examiner's signature

1. You are provided with solution **X** in a test tube and solution **Y**.

a)i) Using a straw, carefully blow your breath into solution **X** for about 3 minutes. Then test the solution with litmus paper. Record the colour change observed. **(4mks)**

Solution.....

Litmus paper.....

b)i) Dip a glass rod into solution **Y** to remove just a little of **Y** and then dip it into solution **X**. Record the colour change observed. **(2mks)**

Solution.....

Litmus paper.....

ii) Using a straw, carefully blow your breath into the mixture (in b) i) for about 3 minutes. Record the colour change observed. **(4mks)**

Solution.....

Litmus paper .....

c)i) State the substance in your breath that caused a colour change in solution **X** in (a) **(1mk)**

.....

(ii) What physiological process in your body is producing the substance named in c(i)

.....

.....

d) State the significance of the process named in c(i) **(4mks)**

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e) Suggest the nature of solution. **(1mk)**

Solution **X**.....

Solution **Y** .....

(i) Give a reason for your answer in e(i) **(3mks)**

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Suggest your conclusion for the above experiment. **(1mk)**

.....

2. You are provided with specimen **X** and **Y** which are structures from the same animal. Examine them and answer the questions that follow.

a) Identify each specimen giving a reason in each case

i)Specimen **X** ..... **(2mks)**

Reasons

.....

.....

Specimen Y.....

Reason

.....

.....

b) Describe how each specimen is adapted to its function.

Specimen X **(2mks)**

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Specimen Y **(2mks)**

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.....

C)i) Put some water in a petri dish and hold specimen **X** under it for 10 seconds then remove it. Record your observation. **(1mk)**

.....

ii) What is the significance of your observation? **(2mks)**

.....

d) Hold specimen **X** and **Y** at the base and bend them record your observation. **(1mk)**

.....

e) Hold specimen **X** at the base and

i)run your fingers from the tip of the vane to the base. Record your observation. **(1mk)**

.....

(ii)run your fingers from the base of the vane to the tip. Record your observation. **(1mk)**

.....

.....

(iii)What is the significance of your observation? **(2mks)**

.....

.....

(f) Draw and label specimen **Y** in the space below. State your magnification.

(4mks)

3. You are provided with specimen **K**, **L** and **M** which are fruits. Cut a cross section of specimen **M**. Examine the specimens using a hand lens where necessary.

a) State the type of fruit, giving a reason in each case. **(4mks)**

i)Specimen **K**

.....

Reason.....

(ii)Specimen **L**.....

Reason.....

(iii)Specimen **M**.....

Reason.....

b) Using observable features, describe how each specimen is dispersed.(9 mks)

i)Specimen **K**

.....

.....

ii) Specimen **L**

.....

.....

ii) Specimen **M**

.....

.....

c)Cut a cross section of specimen **M**. Draw and label the section in the space below. State your magnification.

E N D