Name……**Centre/Index No**……./……

Signature……..

553/1
BIOLOGY
(Theory)
Paper 1
Oct/Nov.2005-Edited
2½ hours

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

Answer **all** questions in sections **A** and **B**, plus **two** questions in Section **C**.

Write the answers to section **A** in the boxes provided, answers to Section **B** in the space provided, and answers to section **C** in the answer booklets provided.

For Examiner's Use Only		
Section	**Marks**	**Examiner's No. and Signature**
A		
B		
C		
Total		

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Turn Over

SECTION A: (30 MARKS)

*Attempt **all** questions in this section. Write the letter representing the most correct answer to each question in the box provided.*

1. Which one of the following organisms improves aeration and drainage of soils?
   A. Fungi
   B. Snails
   C. Bacteria
   D. Termites

2. Which one of the following groups contains the largest number of organisms?
   A. Order
   B. Species
   C. Class
   D. Phylum.

3. People living at high altitudes have more red blood cells than those at lower alttitudes in order to
   A. breathe more quickly
   B. keep the body warm
   C. pump more blood
   D. absorb enough oxygen.

4. Which one of the following best describes the effect of one-sided illumination on the distribution of auxins in a shoot tip?
   A. The auxins are evenly distributed around the tip.
   B. The light inhibits movement of auxins down the tip.
   C. There is a reduction of auxins on the illuminated side of the tip.
   D. The auxins increase on the illuminated side of the tip.

5. The group of organs performing excretory functions is
   A. Kidneys, lungs and skin.
   B. Liver, kidneys and pancreas
   C. Skin, kidneys and pancreas
   D. Lungs, spleen and gall bladder.

6. A cuticle may be regarded as a disadvantage to insects mainly because
   A. It does not allow rapid locomotion.
   B. It limits the size of insects
   C. It does not prevent water loss
   D. It does not allow gaseous exchange.

7. The best description of the leaf in fig.1 is

A. pinnate and parallel veined.

B. Palmate and net veined

C. Pinnate and net-veined

D. Bipinnate and parallel veined.

8. Which one of the following structures of the ear equalises pressure on both sides of the eardrum?

A. Oral window

B. Eustachian tube

C. Semi-circular canal.

D. Round window.

9. Which substance accumulates in the muscles during vigorous exercises?

Water B. Lactic acid C. Carbon dioxide D. Oxygen

10. Stunted growth and mental retardation in children may be due to

A. under production of pituitary hormone

B. under production of insulin

C. deficiency of thyroxine hormone

D. deficiency in adrenaline hormone.

11. Which of the following monosaccharides make up sucrose?

A. galactose and fructose

B. galactose and glucose

C. fructose and glucose

D. two glucose molecules

12. Which of the following parts of a microscope are adjusted in order to bring the specimen into focus?

A. Eyepiece and coarse adjustment
B. Coarse and fine adjustments
C. Eyepiece and fine adjustment
D. Mirror and fine adjustment.

13. P, Q, R and S are characteristics of insects.

P - undergo complete metamorphosis
Q -possess wings
R -have three pairs of legs
S -Divided into three body parts.

Which of them are common to all insects?

A. P and Q
B. R and S
C. Q and S
D. P and R

14.Which of the following is not a characteristic of a respiratory surface?

A. Thin walls.
B. Moist surface
C. Densely supplied with capillaries
D. Smooth surface.

15. Green plants give out less carbon dioxide during day than at night because during the day.

A. The rate of photosynthesis is low.
B. Transpiration interferes with escape of carbon dioxide.
C. Most stomata close
D. Some of the carbon dioxide produced is used for photosynthesis.

16. In comparison with the blood flowing through the vena cava, the blood flowing through the aorta has

A. Less carbon dioxide, more oxygen and higher pressure.

B. More oxygen, more carbon dioxide and lower pressure

C. Less carbon dioxide, less oxygen and lower pressure

D. More carbon dioxide, less oxygen and higher pressure.

17. Which of the following organs contain glands which are part of the endocrine system?

A. Liver,pancreas, heart

B. Brain,pancreas, ovary

C. Brain testes, heart

D. Kidney, heart, liver

18. Oxygen debt occurs during active physical exercise in mammals because

A. alcohol accumulates in the body

B. of anaerobic respiration that occurs

C. of high rate of breathing during exercise.

D. Carbon dioxide produced accumulates during the exercise.

19. Which one of the following explains why a rat loses heat more rapidly to the surroundings than an elephant?

A. A rat has smaller ears than an elephant

B. A rat has a higher metabolic rate than an elephant

C. Surface area: volume ratio of a rat is higher than that of an elephant

D. A rat has fewer hairs than an elephant.

20. Which of the following hormones regulates the amount of water in the body?

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

21. Which one of the following is **not** affected by environmental factors?

A. Height

B. Skin colour

C. Albinism

D. Intelligence.

22. Which of the following is the best definition of excretion?

A. elimination of metabolic wastes from the body

B. Elimination of wastes from the body.

C. Removal of unwanted materials from the body.

D. removal of undigested material from the body.

23. Which one of the following structures of a flower develops into a seed coat after fertilisation.

A. Embryo sac
B. Integuments
C. Receptacle
D. Ovary.

24. Which one of the following would happen to plasmolysed cells of a plant tissue that has been placed in water for some time?

A. Their cell vacuoles would shrink
B. They would not experience any change in size
C. They would increase in volume
D. They would become shorter.

25. Which one of the following is part of the axial skeleton?

A. Humerus
B. Femur
C. Thoracic vertebra
D. Ulna.

26. Which one of the following organs has a double blood supply?

A. Kidneys B. Spleen C. Liver D. Pancreas

27.When milk is the main food in the diet of a child, it should be supplemented with food rich in

A. Iron
B. Calcium
C. Sugar
D. Vitamin D

28. In which of the following are the largest amounts of nitrogenous wastes excreted?

A. Urine
B. Sweat
C. Breath
D. faeces

29. Which of the following describes internal respiration?

A. Breathing in and releasing of oxygen into the tissues
B. Getting rid of carbon dioxide accumulated in the tissue
C. Building up of complex substances
D. Oxidation of food substances to release energy.

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

A. improving soil aeration

B. prevention of soil erosion

C. water retention

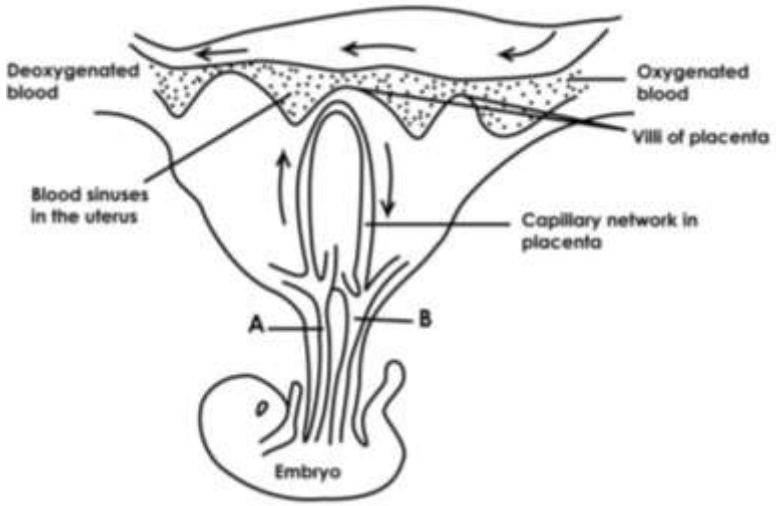
D. increasing soil fertility.

Turn Over

SECTION B: (40 MARKS)

*Answer **all** questions in this section. Answers must be written in the spaces provided.*

31. Fig.2 shows the relationship between blood supply of the embryo, placenta and uterus.



(a) State the functions of the:

(i) Placenta to the embryo. (04 marks)

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Turn Over

(ii) Villi on the placenta

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(b) Give **two** reasons why the mother's blood does not mix with that of the embryo. (02 marks)

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(c) Give **two** differences in the composition between the blood in vessels **A** and **B**. (02 marks)

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32. a) What do you understand by the following terms ?
i) Homozygous
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ii) Genotype
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iii) Recessive gene
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b) A man who is a carrier for albinism married a normal woman. Using suitable symbols, work out the proportion of the genotypes and phenotypes of their children

c) Give three benefits of studying human genetics

i)

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ii)

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iii)

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33. (a) Define the term germination ***(1 mark)***

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(b) Name two types of germination and define **each** ***(4 marks)***

Type	Definition
(i)…… ……	…… ……
(ii)…….....	…… ……

(c) What is meant by seed dormancy ***(2 mark)***

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(d) State any three causes of seed dormancy ***(3 marks)***

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34. a) Define the following terms applied in genetics with an example in each case ***(4marks)***

i) Phenotype……

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Example……

ii) Genotype……………………………………………………………

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Example…………………………………………………………

b) The gene for normal production of haemoglobin is dominated to the mutant gene which causes sickle cell anaemia. If a female heterozygous for the sickle cell anaemia marries a Normal man, illustrate, using suitable symbols, state the possible genotypes and phenotypes of the offspring. ***(6 marks)***

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SECTION C: (30 MARKS)

*Answer any **two** questions.*

35. (a) What are the constituents of fertile soil? (03 marks)

(b) In what ways may human activities:

(i) improve soil? (06 marks)

(ii) degrade soil? (06 marks)

35. (a) Describe the structure of the different types of a bird's feathers, stating the function of each type. (06 marks)

(b) What factors contribute to the bird's ability to fly? (09 marks)

37. (a) What is meant by excretion? (02 marks)

(b) Describe how carbon dioxide is removed from the mammalian body tissues into the atmosphere. (13 marks)

END