

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

553/1
BIOLOGY
(THEORY)
Paper 1
Jul/Aug, 2023
2½ hours



MATIGO EXAMINATIONS BOARD

Uganda Certificate of Education

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	

Turn Over

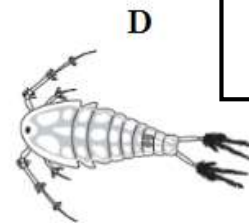
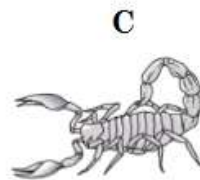
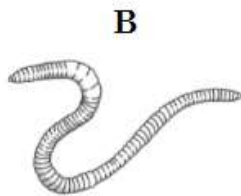
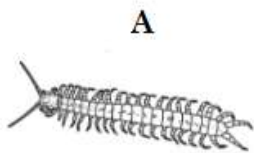
SECTION A (30 MARKS)

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

1. Worms come to soil surface after heavy rain, which characteristic of living organisms does this show?

A. Growth
B. Nutrition
C. Reproduction
D. Sensitivity

2. Which animal is not an arthropod?



3. Spiracles are used in insects in the process of.....

A. Excretion
B. Transportation
C. Breathing
D. Hydrolysis

4. Which chemical could be used to show that cells are respiring aerobically?

A. Benedict's solution
B. Dilute sulphuric acid
C. Ethanol
D. Lime water

5. Where is urine made?

A. Intestines
B. Kidney
C. Liver
D. Muscles

6. Which food type when eaten in excess will cause a rise in the urea content of urine?

A. Fat
B. Protein
C. Carbohydrates
D. Mineral salts

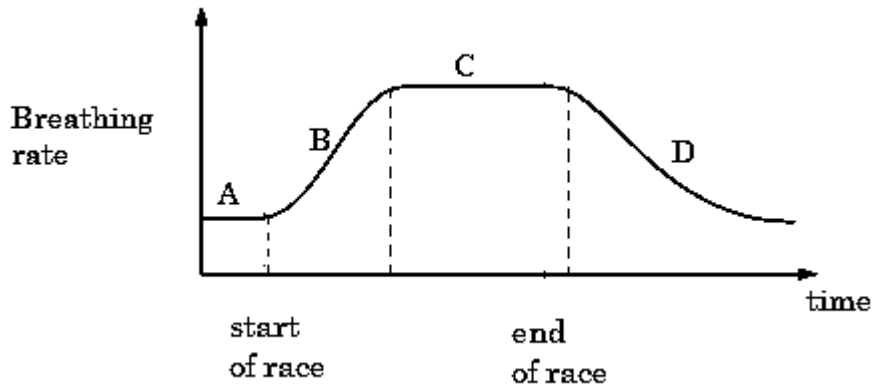
7. A student accidentally touches a very hot object and immediately takes his hand away. In this reflex action, what is the effector?
- A. The spinal cord
 - B. A muscle in his arm
 - C. A heat receptor in his hand
 - D. A motor neuron
8. Which organism do **not** get their energy by eating other organisms?
- A. Consumer
 - B. Decomposer
 - C. Herbivore
 - D. Producer
9. What determines the sex of a baby?
- A. The father's blood group
 - B. The father's sex chromosomes
 - C. The mother's blood group
 - D. The mother's sex chromosomes
10. Which statement explains why the energy flow in a food chain is in one direction?
- A. Energy is not recycled
 - B. Plants convert light energy to chemical energy
 - C. Decomposers recycle nutrients for plants
 - D. The number of organisms decreases at each level in the food chain
11. In a water cycle, how is water lost from the trees?
- A. Condensation
 - B. Respiration
 - C. Translocation
 - D. Transpiration
12. Wild rabbits eat grass and foxes eat rabbits, what would cause the highest increase in the number of rabbits
- A. Less grass and fewer foxes
 - B. More grass and more foxes
 - C. More grass and fewer foxes
 - D. Less grass and more foxes
13. An animal can swim, has a backbone, suckles young and breathes air, to which group does it belong?
- A. Amphibians
 - B. Fish
 - C. Mammals
 - D. Reptiles
14. Which of the following substances is a carbohydrate?
- A. Insulin
 - B. Fatty acid
 - C. Cellulose
 - D. Amino acid

15. The scent from a bunch of flowers spread throughout a room. How does the scent spread?

- A. By conduction
- B. By transpiration
- C. By diffusion
- D. By osmosis

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16. An athlete takes part in a race, the graph shows her breathing rate before, during and after the race. At which point does her body contain the greatest amount of lactic acid?


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17. Which environmental condition is not needed for the germination of seeds?

- A. Carbondioxide
- B. Oxygen
- C. Warmth
- D. Water

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18. A father of blood group A has a baby of blood group O, Which one of the following genotypes is not likely to be that of the mother of this baby?

- A. OO
- B. AB
- C. BO
- D. AO

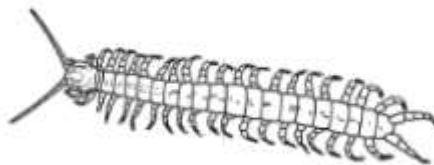
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19. Which part of the blood contains haemoglobin?

- A. Plasma
- B. Platelets
- C. Red blood cells
- D. White blood cells

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20. The diagram shows an arthropod, using the key, identify this arthropod.



1. Body segments clearly visible go to 2
Body segments not visiblego to 4
2. Body with many segments go to 3
Body with three distinct parts go to 4
3. Antennae longer than the legs **A**
Antennae shorter than the legs **B**
4. Three pairs of legs **C**
More than three pairs of legs **D**

21. Which blood vessel contains valves?

- A.** capillary
- B.** renal vein
- C.** renal artery
- D.** Arteriole

22. Below are four word equations.

R Carbondioxide + water → glucose + oxygen

S glucose + oxygen → carbondioxide + water

T glucose → lactic acid

U glucose → alcohol + carbondioxide

What are the equations for anaerobic reparation in humans and anaerobic respiration in yeast?

	Anaerobic respiration in humans	Anaerobic respiration in yeast
A.	S	R
B.	S	U
C.	T	R
D.	T	U

23. Genetics is the study of;

- A.** Development of organisms
- B.** Variation and heredity
- C.** Nuclear division and mutation
- D.** Variation resemblance

24. A flower is a

- A.** Reproductive structure
- B.** Vegetative structure
- C.** Photosynthesis structure
- D.** Calcium homologous structure

25. The following are functions of the stomach to humans except;

- A. Digestion of carbohydrates
- B. Stopping nourishment by micro organisms
- C. Mechanical breakdown of food
- D. Secretion of acid

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26. Proteins requiring a solid corrosive medium are created by the

- A. Pancreas
- B. Stomach
- C. Gall bladder
- D. Duodenum

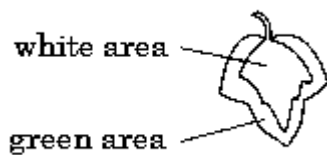
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27. Which of the following human conditions is caused by an insufficiency of a hormone?

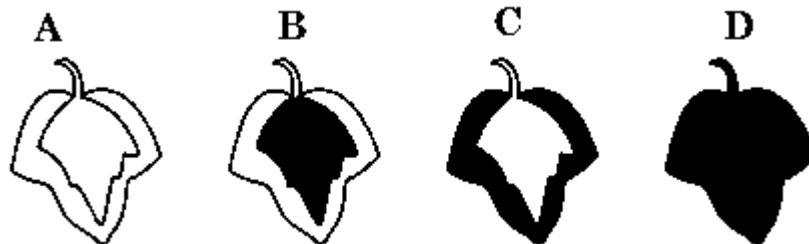
- A. Diabetes
- B. Scurvy
- C. Anaemia
- D. Beriberi

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28. In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution. The diagram below shows the leaf from the plant that was used in the experiment.


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Which diagram shows the result of the experiment?



Key: iodine solution turns blue/black
 iodine solution stays brown

29. Which name is given to the observable features of an organism?

- A. Alleles
- B. Genes
- C. Genotype
- D. Phenotype

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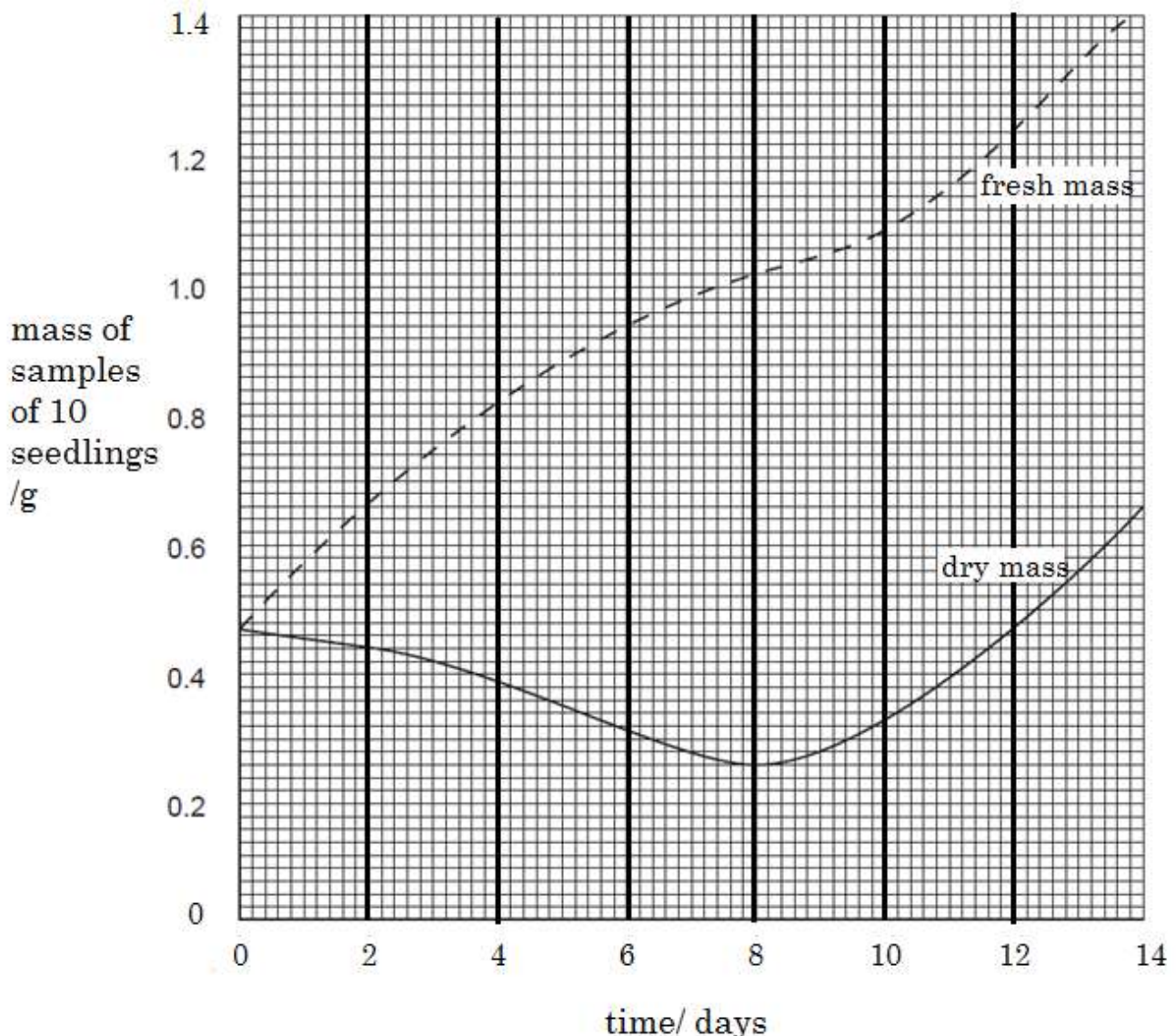
30. Albinism is an inherited condition in which pigment does not develop in the skin, hair and eyes. The allele for albinism is recessive. What are the chances of albino parents having an albino child

- A. 0%
- B. 25%
- C. 75%
- D. 100%



SECTION B (40 MARKS)

31. A large number of seeds were germinated on damp sand. Random samples of 10 seedlings were taken every two days. The fresh mass and the dry mass of each sample were measured and are shown in the graph.



(a)(i) State why the fresh mass and dry mass of a seedling are different.

(2 marks)

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.....
(ii) Fresh mass is not reliable as a measure of plant growth.
Suggest why dry mass is a more reliable measure of plant growth. (2 marks)

.....
.....
(iii) Explain why 10 seedlings, rather than 1, were used for each sample. (2 marks)

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.....
(b)(i) Describe the change in **fresh** mass of the seedlings in the first 2 days after the seeds were set to germinate (1 mark)

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.....
(ii) Suggest a reason for this change in mass. (2 marks)

.....
(c)(i) Describe the change in dry mass of the seedlings during the first 8 days. (2 marks)

(ii) Suggest a reason for this change in mass.

(2 marks)

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(d) Give the processes that occur in the living seed during the early stages of germination giving the relevance of each.

(5 marks)

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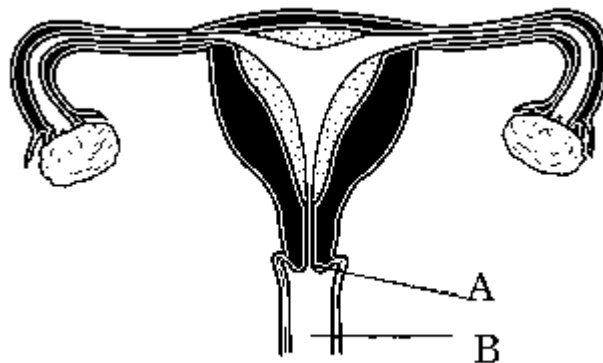
(e) Give three conditions necessary for germination to take place (3 marks)

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32. Figure below shows the female reproductive system



(a) Name the structures labelled A and B

(2 marks)

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(b) Label on the figure above with the appropriate letter

(3 marks)

- (i) Fertilization normally occurs – F
- (ii) Gametes are produced – G
- (iii) Oestrogen is produced – O

(c) List three secondary sexual characteristics that are stimulated by Oestrogen.
(3 marks)

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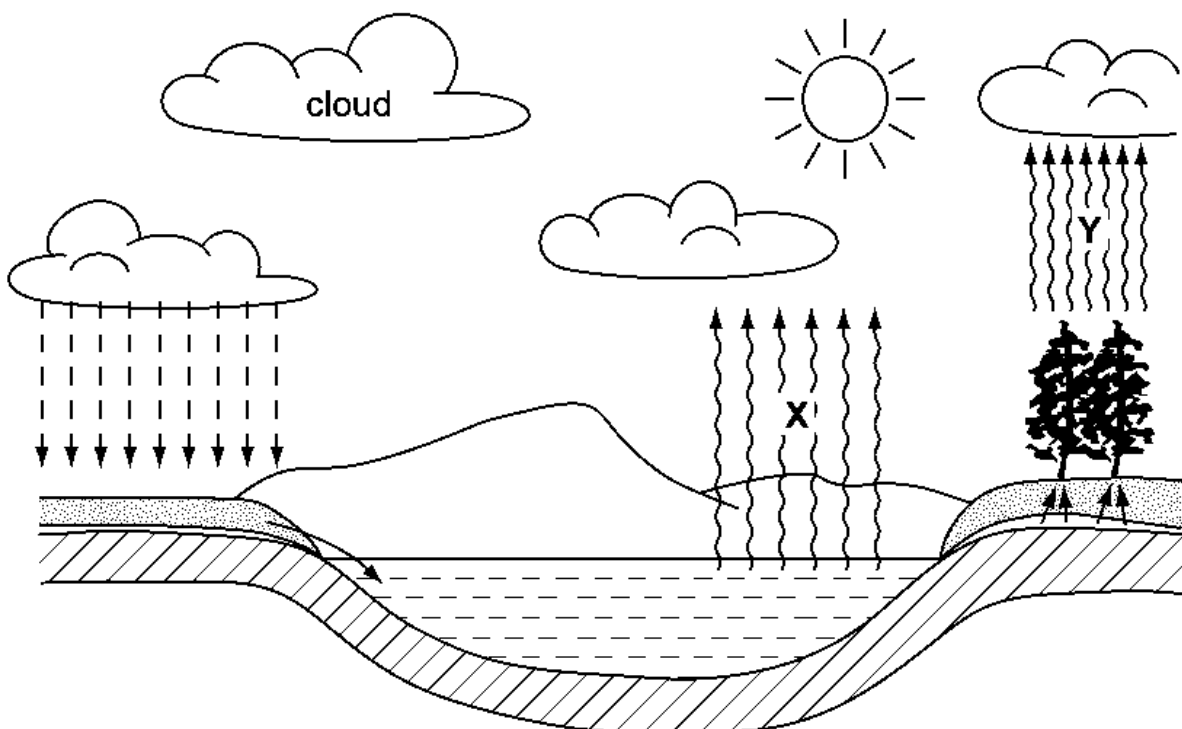
(d) Outline two changes occurring in the ovaries and uterus during the menstrual cycle.
(2 marks)

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33. Fig. below shows the water cycle.



(a) For water to circulate in this cycle a supply of energy is needed.

(i) What is the source of this energy?

(4 marks)

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(ii) State which process is represented by X.

.....

(iii) State which process is represented by Y.

.....

(iv) Suggest what causes cloud formation

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(b) Water is needed by plants. State two ways in which plants use water. (2 marks)

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(b) (i) Describe how water is absorbed by the root hairs of a plant. (2 marks)

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(c) Cereal plants were growing in a field. The field was then flooded with sea water. Suggest why the sea water causes the plants to die. (2 marks)

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SECTION C

- 34 (a)** What are **receptors**? (2 marks)
- (b)** Describe the process of image formation on the retina of a mammalian eye. (3 marks)
- (c)** Describe how a mammalian eye is able to see:
- (i)** a near object. (5 marks)
- (ii)** a distant object. (5 marks)
- 35 (a)** Out line four factors affecting growth of organisms (2 marks)
- (b)** Name the main parts responsible for producing growth in a shoot. (3marks)
- (c)** Describe an experiment you would perform to determine the region of growth in the root of a bean seeding. (10 marks)
- 36. (a)** Outline the physiological changes that occur in the body when a person takes a lot of tap water and then later after 30 minutes takes concentrated salt solution. (11 marks)
- (b)** Giving the organs or structures involved, suggest how excretion is achieved in plants. (4 marks)
- 37.** Discuss the role of hormones in the reproduction of human beings. (15 marks)

END
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