



# MARANDA HIGH SCHOOL

Kenya Certificate of Secondary Education

## MOCK EXAMINATIONS 2021

CODE: 231/1: SUBJECT: BIOLOGY PAPER 1

DECEMBER 2021 – TIME: 2HOURS

Name: \_\_\_\_\_ Adm No: \_\_\_\_\_

Class: \_\_\_\_\_ Candidate's signature \_\_\_\_\_ Date: \_\_\_\_\_ / 11 / 2021.

### INSTRUCTIONS TO CANDIDATES

- Write your name, date, admission number and class in the spaces provided.
- This paper consist of 28 questions.
- Answer **all** the questions in the spaces provided.

### FOR EXAMINER'S USE ONLY

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-28	80	

@2021 The Maranda School Mock Examinations

Kenya Certificate of Secondary Education

BIOLOGY

Paper 1

1. Identify the respiratory surfaces used by the following organisms.

(i) Locust (1 mark)

**Tracheoles**

(ii) Paramecium (1 mark)

**Cell membrane**

(iii) Name the causative agent of Tuberculosis (1 mark)

**Mycobacterium tuberculosis /Mycobacterium bovis**

2. Explain the biological significance of the following:

(i) The mammalian testis hanging outside the body. (1 mark)

**Provide a cool environment/low temperature; that is conducive**

**/good/suitable/required/favour (good quality) sperm production;**

(ii) Coiled nature of the epididymis. (1 mark)

**increase surface area for sperm storage;**

(iii) Breeding season of amphibians coincides with long rainy season. (1 mark)

**Sexual reproduction in frogs require water/aquatic medium;**

3. State **two** ways by which plants manage their solid wastes. (2 mark)

4. State the effect of movement of the diaphragm muscles during inhalation in mammals. (3 marks)

**Diaphragm muscles contract and it flattens; leading to increase in volume of the thoracic cavity; decreasing the pressure inside it; (forcing air in)**

5. The following are text messages on a cellphone that represent gene mutation.

	Intended message	Actual message
I	I hate meat	I ate meat
II	This is my team	This is my mate

(a) Identify the type of gene mutation represented in each case

**I. *deletion*;**

(1 mark)

**II. *inversion*;**

(1 mark)

7. Below are diagrams representing developmental stages of three different vertebrates.



(a) State the evidence of evolution illustrated by the vertebrates in the diagrams above.

(1 mark)

***Comparative embryology;***

(b) Suggest why the structure labeled **J** has been retained throughout the evolution of fish. (2marks)

*Fish remained in the aquatic habitat/aqueous medium; hence well developed tail/fin for propulsion/movement;*

8. An individual is of blood group **B** positive.

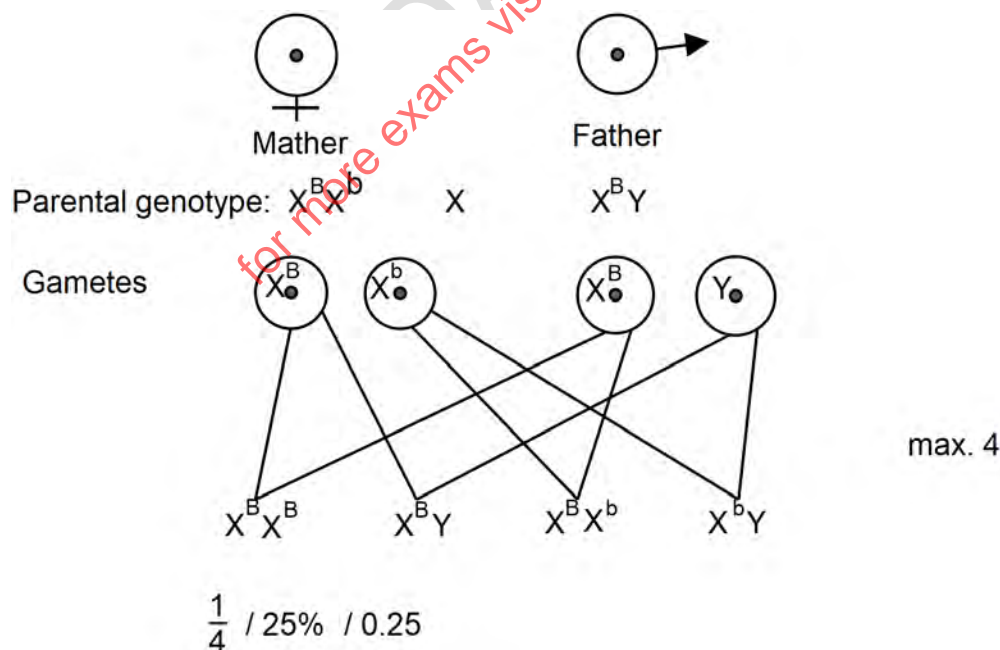
(a) Name the antigens in the individual's blood group. (2marks)

*-Antigen B; - Antigen D/rhesus antigen/rhesus factor;*

(b) Give the reason why the individual **cannot** receive blood from a blood group **A** donor. (2marks)

*Has antibody a in the blood plasma of the recipient and will correspond with antigen A in the donor's blood ; hence there will be agglutination;*

9. Colour blindness is a sex linked trait controlled by a recessive gene **b**. If a mother is a carrier and the father is normal, what is the probability that their son will be colour blind? Show your working. (4marks)



10. (a) Explain the **two** role of diffusion in human beings. (2marks)

- ***Absorption of materials;e.g diffusion of digested food materials into blood stream.***
- ***Gaseous exchange;e.g carbon iv oxide diffuses from the capillaries into the alveoli/oxygen diffuses from alveoli to capillaries;***
- ***Excretion of nitrogenous wastes ;e.g urea diffuses out of the blood capillaries into the elination sites.***

(b) What is meant by each of the following terms?

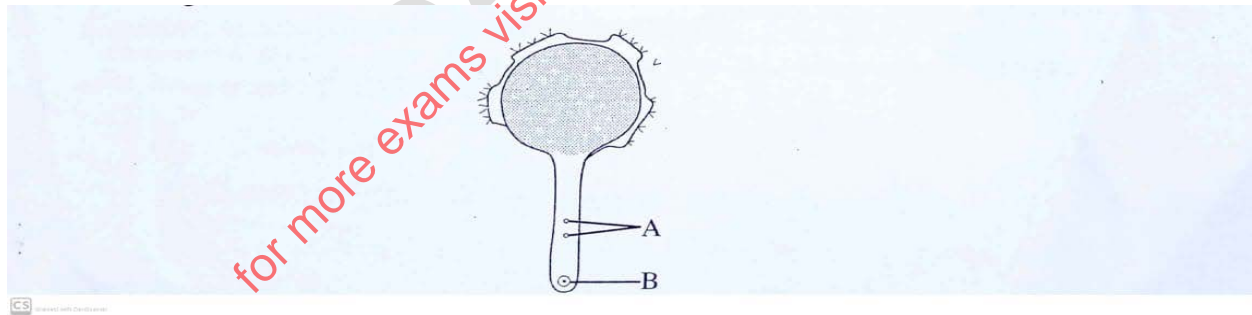
(i) Crenated cell. (1mark)

***A shrunk animal cell that has lost water by osmosis; acc. RBC***

(ii) Flaccid cell. (1mark)

***Flubby /shrunk plant cell that has lost water by osmosis; acc.epidermal cell.***

11. The diagram below illustrates a growing pollen tube.



(a) Name the part labeled **B**. (1mark)

***Tube nucleus***

(b) Explain the role of the part labeled **A**. (2marks)

***One male nucleus fuses with the egg cell to form a zygote;the other male nucleus fuses with the polar nuclei to form the endosperm;***

12. (a) State **one** function of each of the following parts of a mammalian eye:

(i) Eye lashes. (1 mark)

**Trap foreign particles entering the eye; acc.emaples of foreign particles e.g dust/small insects**

(ii) Lachrymal gland. (1 mark)

**Production of tears;/produces a fluid /tears which washes foreign particles out of the eye/has antiseptic properties /kills pathogen/harmful micro organisms;**

(b) Give a reason why the image is **not** formed when the light is focused on the blind spot. (1 mark)

**Lacks both cones and rods ;(hence images are not perceived)**

13 (a) Define the term **field of view** as used in microscopy. (1 mark)

**A circular area seen when forocusing /viewing through the eye-piece of a microscope;**

(b) State **one** functions of the body tube of a light microscope. (1 mark)

**Hold the revolving nosepiece/objective lenses in position;**

**Hold the ocular/eye-piece lens in place;**

14. How is the human stomach adapted to:

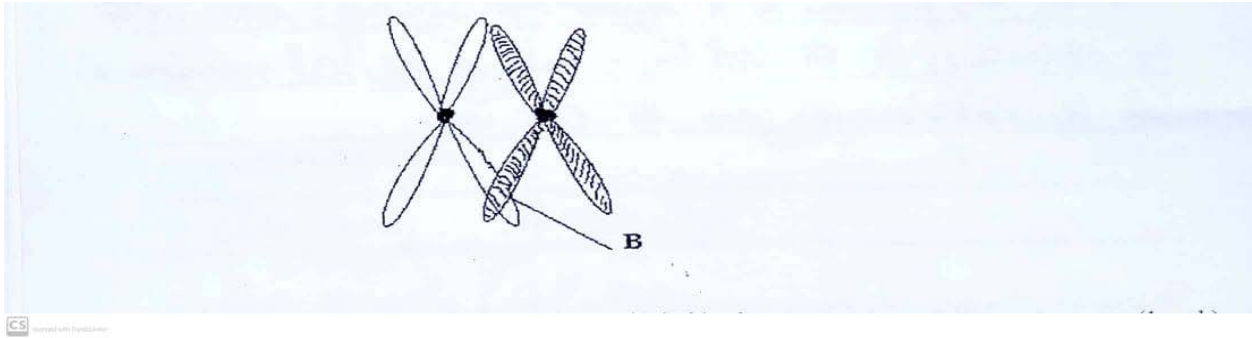
(i) Protein digestion. (2marks)

**Has gastric gland;that secretes gastric juice; acc.content of gastric juice e.g hcl,pepsin,renin,mucus.**

(ii) Churning. (2marks)

**Thick muscular walls;that contracts and relax;**

15. The diagram below shows a phenomenon which occurs during cell division.



(a) Identify the stage of cell division in which this phenomenon occurs. (1mark)

**Prophase I;**

**rej. Meiosis I**

(b) Explain the importance of the phenomenon taking place in the part labeled B on the diagram above. (2marks)

**Allow for exchange of important genetic materials; resulting into variation;**

16. A wild beast in maasai mara national park was found to be infested with a lot of ticks. State the trophic level occupied by the following organisms.

(a)(i) Wild beast. (1mark)

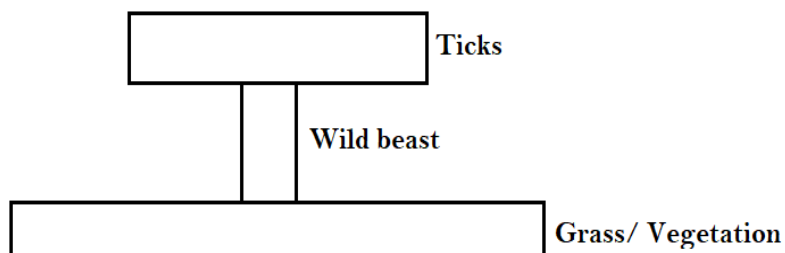
**Primary consumer;**

(ii) Ticks. (1mark)

**Secondary consumer;**

(b) Sketch a pyramid of numbers to represent the above feeding relationship.

(1mark)



(bears almost equal width)



17. (a) Define seed dormancy. (1mark)

*A condition /period of rest during which a viable seed performs its physiological process slowly and utilizes little food /cannot germinate even if all the environmental conditions /factors for germination are provided;*

(b) State **two** causes of seed dormancy. (2marks)

*Immature embryo/impermeable testa/unfavourable temperature/growth inhibitors/inadequate germination enzymes/inadequate light wavelength;*

18. Name the type of response exhibited by the following:

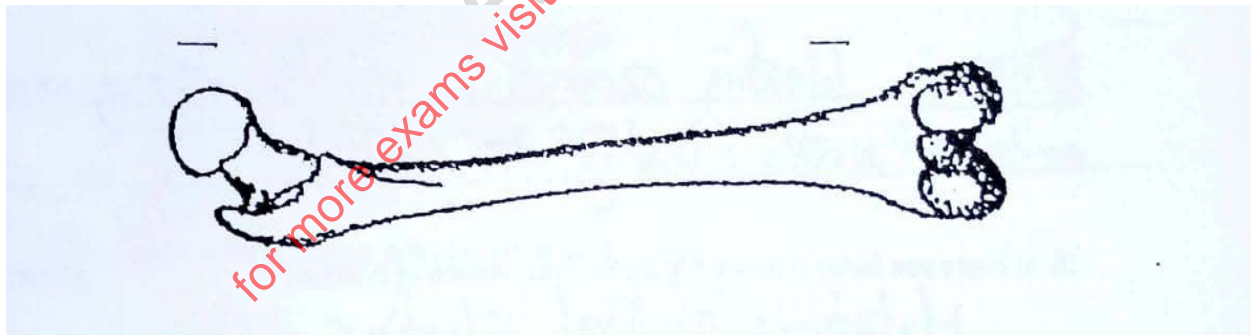
(i) A pollen tube growing towards the embryo sac. (1mark)

*Positive chemotaxis;*

(ii) A maggot moving from lit side of a box to the dark side. (1mark)

*Negative phototaxis;*

19. The diagram below illustrates a mammalian bone.



(a) (i) Identify the bone. (1mark)

*Femur;*

(ii) Name the region in the human body where the bone named above is found.

(1mark)

*Upper hind limb;*

*acc thigh*



(iii) Name the type of joint formed by the bone at the proximal end. (1mark)

**Ball and socket joint;**

(b) What is the role of the inter-vertebral column? (1mark)

**Reduce friction(between vertebrae);**

**absorb mechanical shock;**

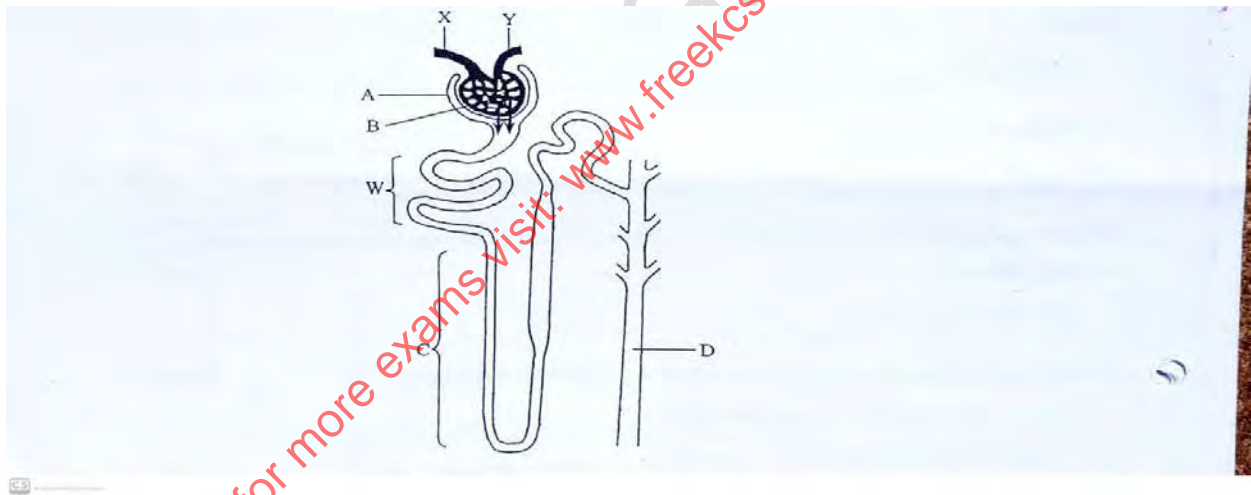
**allow flexibility of the vertebral column;**

20. Name the hormone that sustain the larval stage in insects and the structure that produces it.

Hormone. **Juvenile;** (1mark)

Structure. **corpus allatum;** (1mark)

21. The diagram below represents a nephron from a mammalian kidney.



(a) Name the parts labeled **B** and **C**. (2marks)

**B glomerulus;**

**C loop of henle;**

(b) Name the component of blood present in part labeled **B** but absent in part labeled **C**. (1mark)

**Plasma protein; / blood cells** (first one)

(c) State one substance that is reabsorbed at the part labeled W. (1mark)

**Glucose;vitamins;amino acids;hormones;watet;** (fisrt one)

22. (a) What is glycolysis? (1mark)

**Breakdown of glucose into pyruvic acid;**

(b) Where in the cell does it take place? (1mark)

**Cytoplasm;**

23. State how the following parts of the mammalian ear adapted to their functions.

(a) cochlea. (2marks)

**Highly coiled;to increase surface area for attachment of sensory cells;or has systems of canals filled with endolymph and perilymph,to absorb mechanical sock**

(b) Pinna. (2marks)

**Funnel shaped to enable it collect and direct sound waves into the external auditory meatus/auditory canal;**

24. Two students used identical microscopes separately. Student A observed 10 bacteria while student B saw 50 bacteria from the same slide. Suggest a reason for the difference in numbers. (1mark)

**A used objective lens with higher magnification power/widerfield of view while B used lower magnification power/wider field of view;**

25. (a) what are fossils? (1mark)

**Past materials /remains of ancestral forms of organisms that were accidentally preserved in a naturally occurring material;**

(b) Name the type of placentation where:

(i) Placenta appears as one ridge on the ovary wall. (1 mark)

**Marginal;**

(ii) Placenta is at the center of the ovary with ovules on it and the dividing walls of the carpel disappear. (1 mark)

**Free central**

26. (a) Name the cell organelle found in abundance in the white blood cell. (1 mark)

**Lysosome; acc golgi bodies**

(b) Give a reason for your answer in (a) above. (1 mark)

**Lysosomes –contain lytic enzyme that destroy the pathogen;**

**Golgi bodies-forms lysosomes which contain the lytic enzyme to destroy the pathogen;**

27.(a) In which form do the following organism excrete their nitrogenous waste.

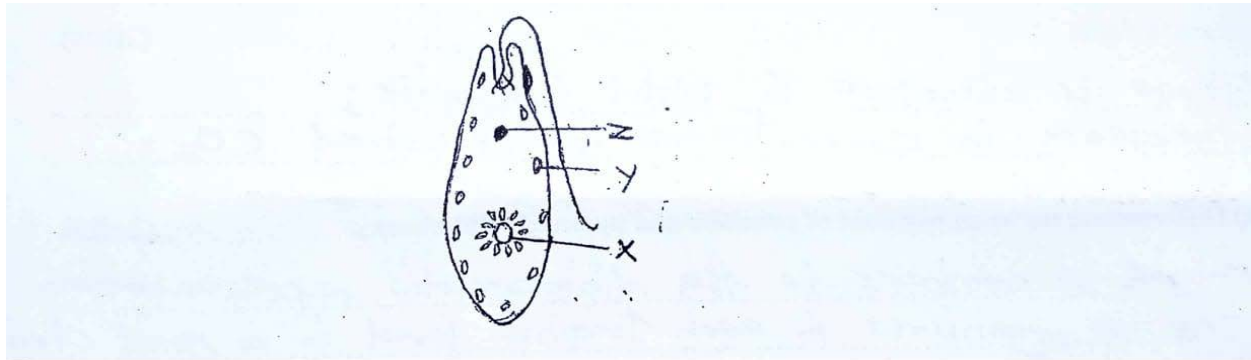
(i) Insects **uric acid;** (1 mark)

(ii) Birds **uric acid;** (1 mark)

(b) What advantage do the insects have by excreting the nitrogenous waste named in (i) above? (1 mark)

**Uric acid is less toxic and less water soluble hence its excretion consumes little water;thus water is consumed;**

28. Below is a diagram of *Euglena gracilis*. use it to answer questions that follow.



(a) Classify the organism into the following taxa.

(i) Kingdom *protocista*; (1mark)

(ii) Genus *Euglena*; (1mark)

(b) Name the structure labeled X. (1mark)

*Contractile vacuole*;

(c) How is the structure Y adapted to its function? (1mark)

*Contain chlorophyll pigment that trap light energy for photosynthesis*;

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