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	

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

(i) Locust (1mark)

Tracheoles

(ii) Paramecium (1mark)

Cell membrane

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

Mycobacterium tuberculosis /Mycobacterium bovis

2. Explain the biological significance of the following:

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

Provide a cool environment/low temperature;that is condusive

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

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

increase surface area for sperm storage;

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

Sexual reproduction in frogs require water/aquatic medium;

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

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

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.

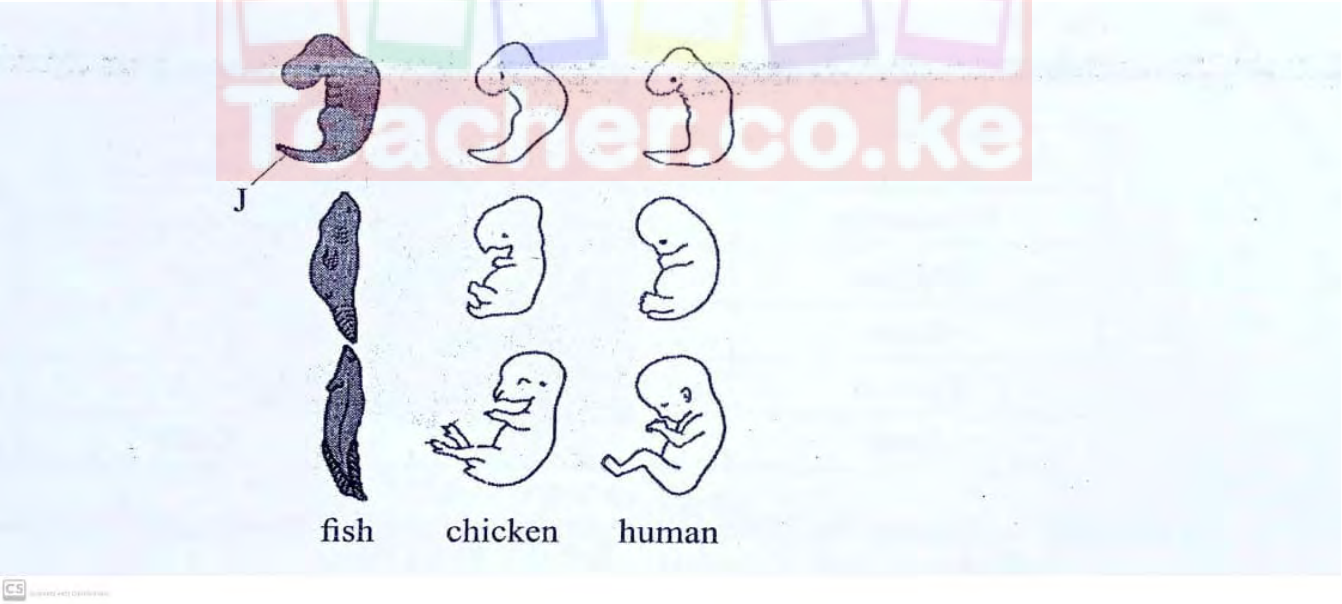
	Intended message	**Actual message**
I	I hate meat	I ate meat
II	This is my team	This is my mate

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

I.***delition;*** (1mark)

II.***inversion;*** (1mark)

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. (1mark)

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.

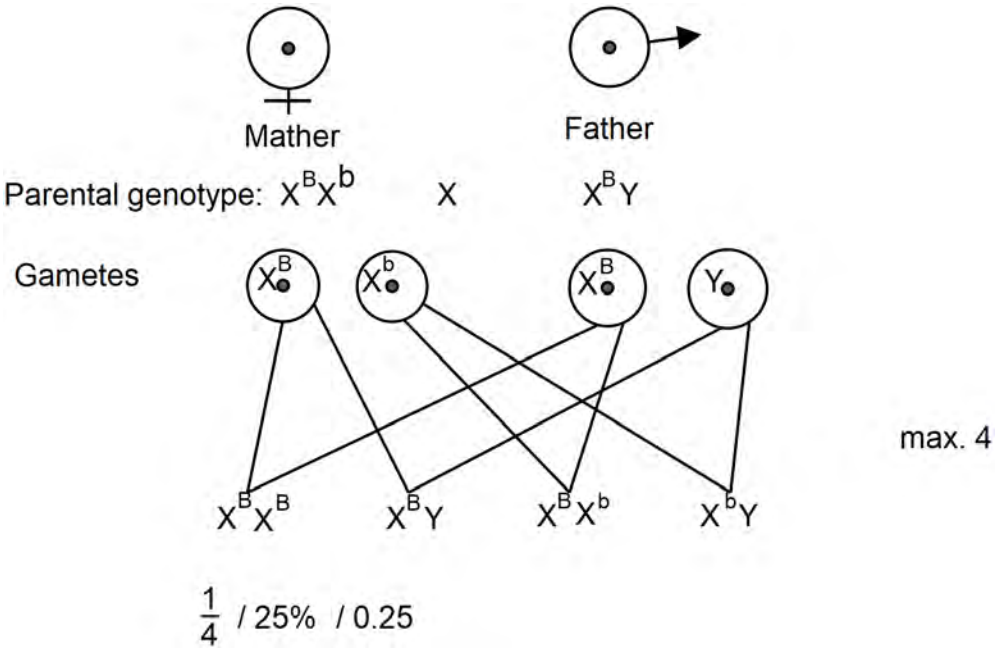
(a) Name the antigens in the individual's blood group. (2marks)

-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 <u>a</u> in the blood plasma of the recipient and will correspond with antigen <u>A</u> 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)



max. 4

$\frac{1}{4}$ / 25% / 0.25

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?

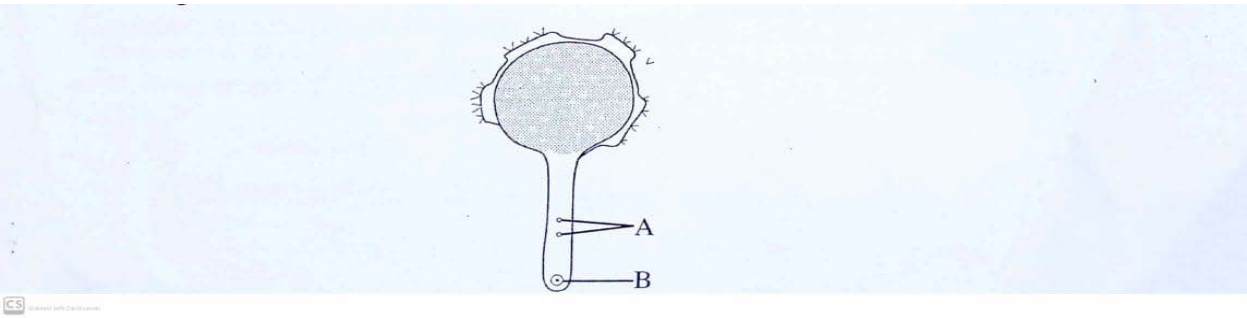
(i) Crenated cell. (1mark)

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. (1mark)

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

(ii) Lachrymal gland. (1mark)

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. (1mark)

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

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

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

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

Hold the revolving nosepiece/objective lenses in position;

Hold the ocular/eye-piece lens in place;

14. How is the human stomach adapted to:

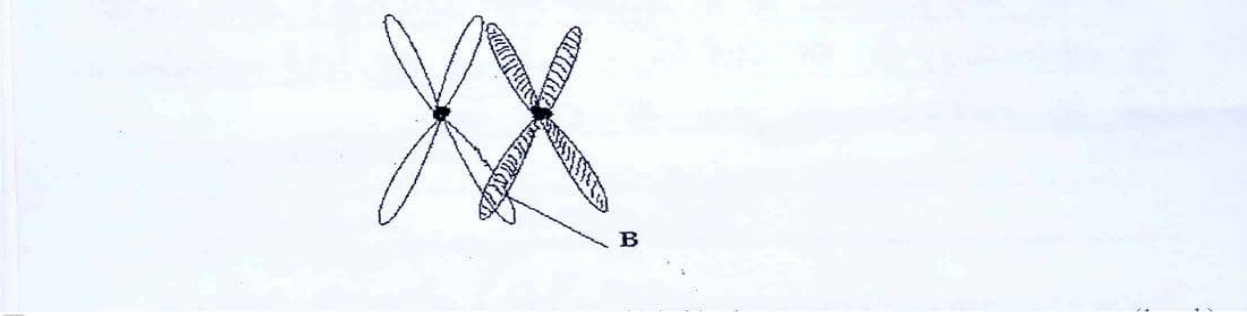
(i) Protein digestion. (2marks)

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.

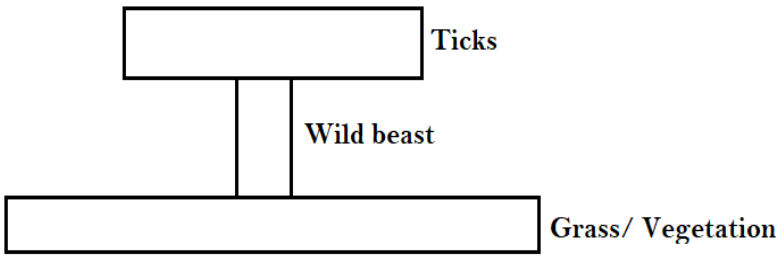
(a)(i) Wild beast. (1mark)

Primary consumer;

(ii) Ticks. (1mark)

Secondary consumer;

(b) Sketch a pyramid of numbers to represent the above feeding retionship. (1mark)



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:

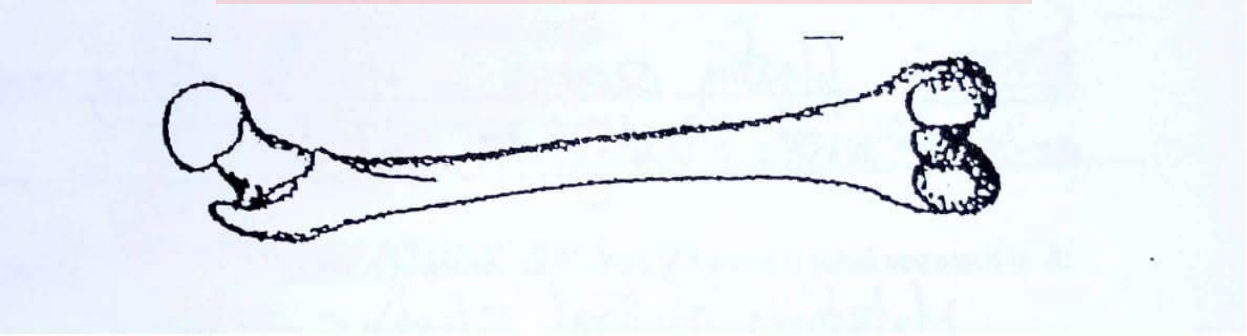
(i) A pollen tube growing towards the embryo sac. (1mark

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;

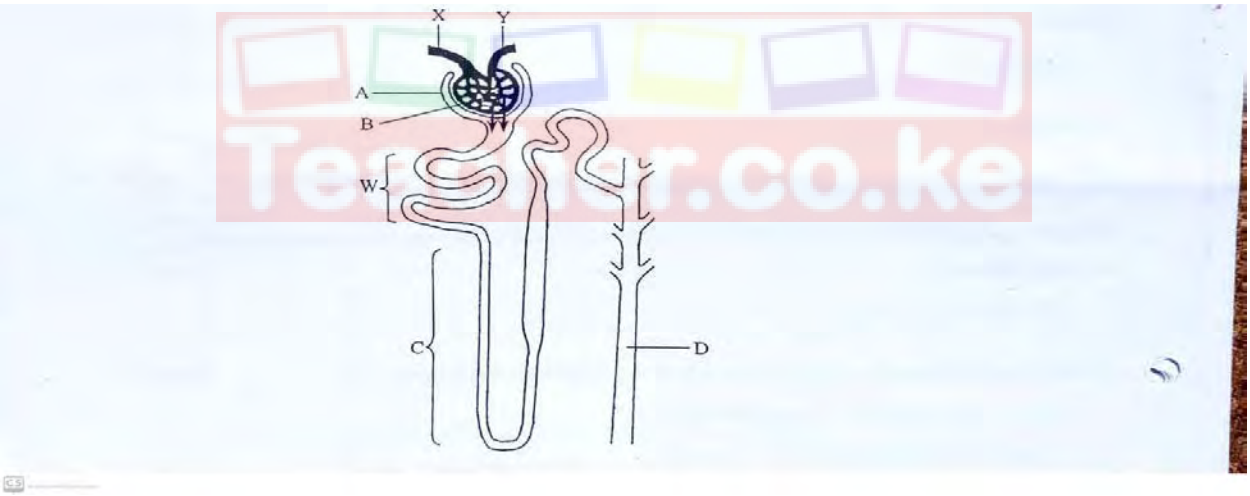
allow flexibility of the vertebral column;

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. (1mark)

Marginal;

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

Free central

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

Lysosome; acc golgi bodies

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

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.

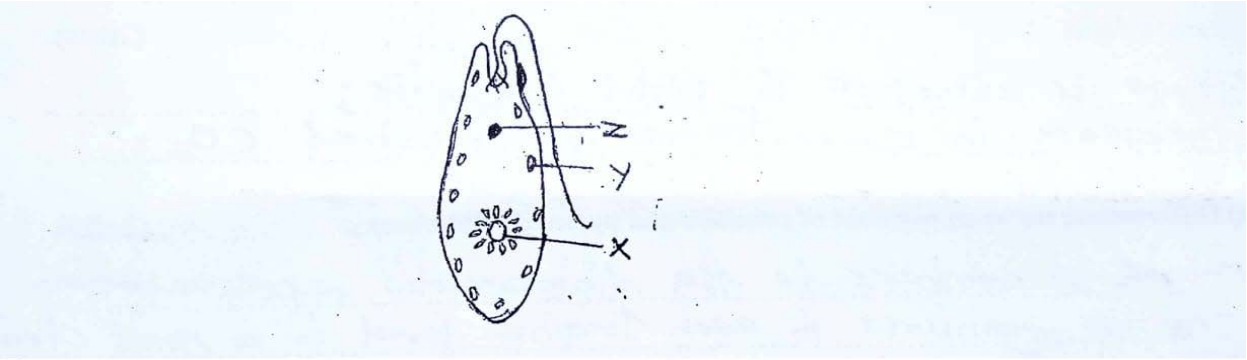
(i)Insects ***uric acid;*** (1mark)

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

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

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 gacilis*.use it to answer questions that follow.



(a) Classify the organism into the following taxa.

(i) Kingdom ***protoctista;*** (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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