



MARANDA HIGH SCHOOL

Kenya Certificate of Secondary Education

MOCK EXAMINATION 2022

CODE: 231/1

SUBJECT: BIOLOGY

PAPER 1

AUGUST/SEPTEMBER 2022

TIME: 2Hours

Name: Adm No:

Class: Candidate's Signature: Date:...../9/2022

INSTRUCTIONS TO CANDIDATES

Write your name and ADM Number in the spaces provided above.
 Sign in the spaces provided above.
 Answer **ALL** questions in the spaces provided.
 All workings **MUST** be clearly shown where necessary.
 This paper consists of **10** Printed pages.

Candidates should check the question paper to ensure that all the papers are printed as indicated and no questions are missing

FOR EXAMINERS USE ONLY.

Question	Maximum Score	Candidates Score
1 – 30	80	

1. Name the organelle that performs each of the following functions in a cell

(i) Protein synthesis. (1 mark)

Ribosome;

(ii) Transport of cell secretions. (1 mark)

Golgi apparatus / bodies;

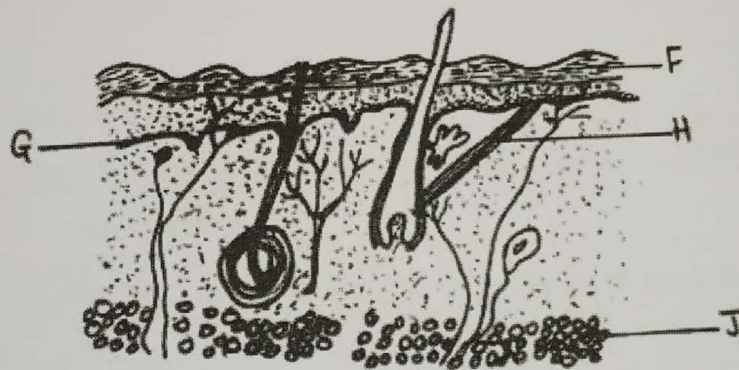
2.(a) Define the term 'parthenocarpy'. (1 mark)

fruit formation without fertilization;

(b) Name two plant growth hormones that promote parthenocarpy. (2 marks)

Auxins
Gibberellin;

3. The diagram below shows a longitudinal section of mammalian skin.



a) Name the parts labelled F and G. (2 marks)

F. Cornified layer;

G. Malpighian layer;

b) State one function of each of the parts labelled H and J (2 marks)

H. Contracts and relax to raise and lower hair follicles;

J. Storage of fat; // Insulation against heat loss;

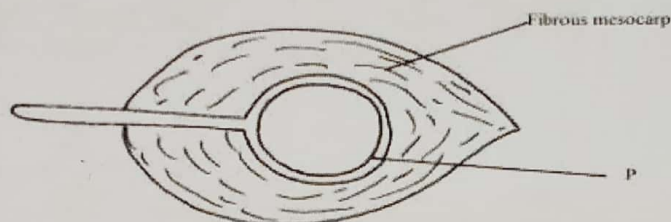
4. (a) State **two** characteristics that are used to divide the phylum Arthropoda into classes.

- ✓ Number of body parts; (2marks)
- ✓ Number of legs
- ✓ Presence and number of Antennae;

(b) Name the class with the largest number of individuals in the phylum Arthropoda. (1mark)

Insecta;

5. The diagram below represents a longitudinal section of a fruit



(i) Identify the mode of dispersal

(1mark)

Water;

(ii) Describe **two** adaptations of the fruit to its mode of dispersal

(2marks)

- ✓ Has fibrous mesocarp which store air to enable it to float
- ✓ Has tough seed coat which is impermeable to water;

6.(a) What causes the following diseases?

(i) Diabetes mellitus.

(1mark)

Insufficient/less insulin secretion;

(ii) Diabetes insipidus.

(1mark)

Insufficient/less secretion of Antidiuretic hormone;

b) An individual shows the symptoms for diabetes mellitus, how would you determine in the school laboratory whether they are positive for the condition?

(2marks)

Take urine sample from the patient and put in a test-tube
add Benedict's soln; then boil; (then note the colour change)

7.(a) Give two examples of natural selection in action.

(2marks)

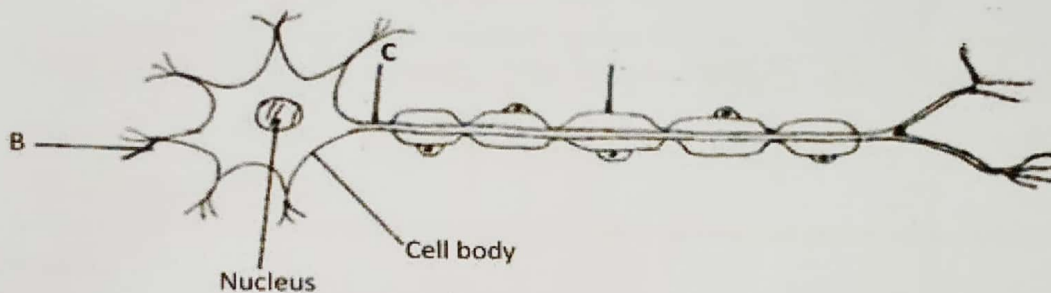
- ✓ Resistance against insecticides & Antibiotics
- ✓ Industrial melanism;

(b) List two features that make man the most dominant species on earth.

(2marks)

- ✓ Ability to communicate through speech;
- ✓ Upright posture;
- ✓ A modified forelimb into hand/arm with opposable thumb for manipulation of tools;

8. Study the diagram below of a neurone in human being.



(a) Identify the neurone.

(1mark)

Motor Neurone;

(b) Name the part labeled B

B. Receptor dendrite; (1mark)

9. Study the diagram of the mammalian tooth below and answer the questions that follow.



(a) Identify the tooth.

(1mark)

Premolar;

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

(1mark)

- ✓ Has two roots;
- ✓ Has cusps

(c) State **one** adaptation of the tooth to its function.

(1 mark)

- ✓ Has wide top surface for to increase s.a for grinding/chewing;
- ✓ Has cusps for grinding/chewing;

10. It was found that during germination of pea seeds 9.3cm^3 of carbon (iv) oxide was produced while 9.1cm^3 of oxygen was used up.

a) Calculate the respiratory quotient (RQ) of the reaction taking place.

(2 marks)

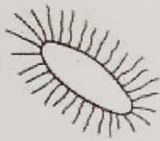
$$\text{R.Q} = \frac{\text{Vol of Carbon (iv) oxide produced}}{\text{Vol of oxygen produced consumed}} = \frac{9.3\text{cm}^3}{9.1\text{cm}^3} = 1.02198;$$

b) Explain why it is difficult to measure respiratory quotient in plants.

(1 mark)

Oxygen produced during photosynthesis is used for respiration and CO_2 produced in respiration is utilized in photosynthesis;

11. The diagrams below represent two types of bacteria species that causes some human diseases.



A



B

Identify each bacterium and state the disease it causes.

(4 marks)

A: Salmonella typhi;

Disease it causes: Typhoid;

B: Vibrio cholerae;

Disease it causes: Cholera;

12.a) What is metamorphosis?

(1 mark)

Developmental changes in the body form of arthropods/organisms in the course of its life cycle from egg to adult form;

b) What is the biological significance of metamorphosis to an insect? (2marks)

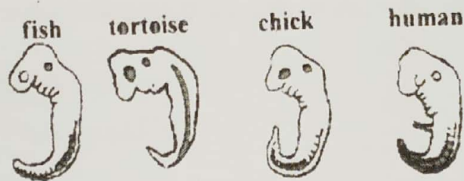
- ✓ Enables an organism to grow in size & complexity;
- ✓ Enable an organism to exploit different ecological niche;

13. Study and complete the table below.

(3mks)

Feature	Monocot	Dicot
a) Number of stamens	In multiples of three	In multiples of 4s or 5s
b) Arrangement of vascular bundle in stem	Scattered	Arranged in a ring;
c) Type of root	Fibrous root system	Tap root system;

14. The diagrams below show embryos of certain vertebrates animals. Study them and answer the question that follows.



a) Mention two observable structural features in these embryos that suggest that they have a common ancestral origin. (2marks)

- ✓ Have a tail;
- ✓ Have a notochord;

(b) What phenomenon in organic evolution is exhibited by these diagrams of embryos?

(1marks)

Comparative Embryology;

15. What is meant by the terms?

(2marks)

a) Hypogynous flower

A flower with superior ovary with other floral parts below the ovary;

b) Dichogamy

A condition in which male & female floral parts mature at different times;

16. What is the main difference between the phloem tissues of sub divisions

Gymnospermophyta and Angiospermophyta.

(1mark)

Gymnospermophyta - Lacks Companion Cells; }
Angiospermophyte - Have Companion cells }

17. State ~~one~~ ^{two} ways in which the skin of a frog is adapted for gaseous exchange.

(2marks)

- ✓ Moist to dissolve respiratory gases;
- ✓ Thin epithelium to offer a shorter diffusion distance for gases
- ✓ Highly vascularized to transport the respiratory gases;

18. What would be the effect of the following treatments on the nerve transmission?

(i) Inducing the axon with metabolic inhibitors.

(1mark)

Stops nerve transmission;

(ii) Removing myelin sheath from a nerve fiber.

(1marks)

Lower speed of nerve transmission;

19. Give one reason why blood leaving the lungs may not be fully oxygenated

(1mark)

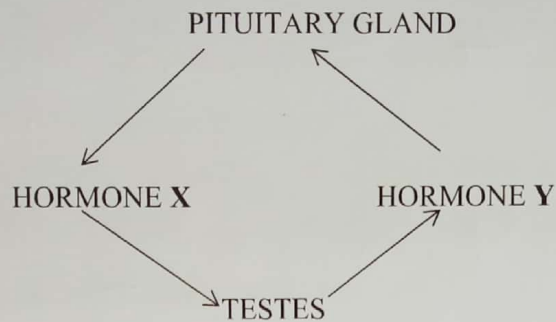
- ✓ Blockage of alveoli / air sacs;
- ✓ Infection of the breathing system; ✓ High pumping speed of the heart.

20. What is the importance of Retina in vision.

(2marks)

✓ Retina contains photoreceptor cells (Rods & Cones) which are sensitive to different light intensities;

21. The diagram below represents a simple endocrine feedback mechanism in human male.



(a) Name the hormone labelled X (1 mark)

Interstitial cell stimulating hormone; Rj. Aberr.

(b) State **two** differences that may be observed between a normal male and one who is incapable of producing hormone labelled Y. (2 marks)

- ✓ Absence of beards;
- ✓ Less masculine;
- ✓ ~~Voices~~ Shrewed voice
- ✓ Sterility

22. a) Name the cartilage found between the bones of the vertebral column. (1 mark)

Intervertebral disc;

b) State the function of the cartilage named in (a) above. (1 mark)

- ✓ Shock absorber
- ✓ Reduce friction btw the vertebrae
- ✓ Allow flexibility of the column

23. The cells shown below were obtained from two different plant cells which were immersed in 2% and 25% salt solutions



A



B

(a) Which of the two cells A and B was immersed in 2% salt solution? (1 mark)

B;

(b) Comment on the nature of 25% salt solution in relation to the cell sap. (1 mark)

Hypertonic;

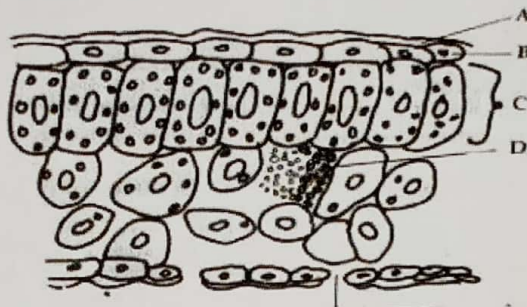
(c) What biological phenomenon leads to the observation made in A. (1 mark)

Plasmolysis;

24. Name **one** structures found in the cortex of the kidney (1 mark)

✓ Proximal convoluted tubule; ✓ Bowman's capsule;
✓ Distal convoluted tubule; ✓ Glomerulus;

25. The diagram below shows the internal structure of a leaf



(a) Name the part labelled B (1 marks)

Upper epidermis / upper epidermal cells;

(b) State the function of the part labelled C. (1 marks)

Photosynthesis; / site for photosynthesis;

(c) State **two** difference between xerophytes and hydrophytic leaves. (2 marks)

xerophytes	Hydrophytic
Thick cuticle Few sunken stomata Leaves reduced in size	Thin cuticle; Many exposed stomata; leaves are broad;

26. a) Distinguish between gaseous exchange and respiration. (1 mark)

G/Exchange is the passage of respiratory gases across respiratory surface while Respiration is the chemical breakdown of food (in cells) to release energy;

b) Explain the disadvantages of anaerobic respiration in plant roots.

(2marks)

Lower rate of m^2/m^3 uptake by active transport, due to low energy output; // Ethanol produced poisons the tissues leading to their death;

27. a) Suggest the significance of the following adaptations in bony fish.

(i) Flexible vertebral column

(1mark)

✓ Allows body to move from side to side / bending;

(ii) Presence of swim bladder

(1mark)

Air filled to make fish buoyant / keep fish afloat / allow change in depth;

b) State two features which reduce resistance in fish during swimming.

(2marks)

✓ Streamlined body; ✓ Inflexible head;

✓ Scales overlapping pointing backwards;

✓ Muscles on the sides / swim scales;

28. State two protective functions of human eye.

(2marks)

✓ Eyeball within sockets / orbit for protection from mechanical injuries;

✓ Eyebrow prevents sweat from entering the eyes;

✓ Lacrymal gland secrete tears which is antiseptic

✓ Eye lids protect prevents entry of dust / small particles into the eye.

29. State two different between photosynthesis and respiration

(2marks)

Photosynthesis	Respiration
✓ occurs in the chloroplast	occurs in the mitochondria / cytoplasm;
✓ CO_2 is used up	CO_2 is given out
✓ O_2 is released	O_2 is used up;
✓ Glucose is formed	Glucose is used up;

30. Explain why malaria can not be transmitted through blood transfusion

(2marks)

It is a vectorborne disease. Parasites are transmitted from sick individual to a healthy one through bites of infected female Anopheles mosquito;

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