Name: Marking scheme

Adm No ..... Signature.....

Date: .....Stream.....

231/1

BIOLOGY

PAPER 1 FORM 3

JULY 2019 END TERM EXAM

TIME: 2 HOURS

SUNSHINE SCHOOL

FORM THREE END TERM EXAM JULY 2019

INSTRUCTIONS TO STUDENTS:

- *Write your **name** and **admission number** and **stream** in the spaces provided above.*
- *Sign and write **date** of the examination in the spaces provided above*
- *Answer **all** the questions*

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-22	70	

This paper consists of 7 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing.

1. i) State the physiological changes that would occur in the following structures if the environmental temperature was raised gradually from 22^0c to 40^0 c (2mks)

Sweat glands: Produce more sweat | increase in sweat production;

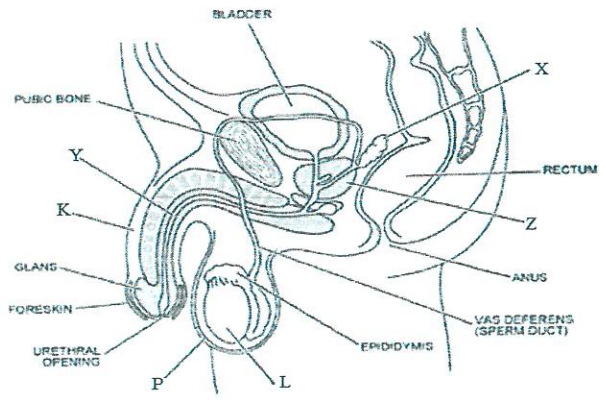
Blood capillaries: Vasodilates | increase of blood flow to the skin;
Rej blood vessels moves to the skin surface

(ii) The government of Kenya has for a long time tried to ban the use of skin lightening cosmetics, but some people continue using them . State two adverse effects such cosmetics may have on the skin. (2mks)

Promotes skin infections;
Causes skin cancer;
Adrenal disorders;
Increase risks of hypertension and diabetes;
Harm unborn babies;

Mark the 1st two (any 2)

2. The diagram shown below represents a male reproductive system.



(a)Name the structure labelled **X** (1mk)

Seminal vesicle

(b)Name **one** substances that pass through structure labelled Y (**1** mk)

Semen | Sperm cells ;

Urine ;

3 The table below shows the oxygen consumption and carbon (IV) oxide released at rest by a number of animals under certain conditions.

Animal	Body mass(g)	Carbon (IV) oxide released in cm^3 per hour	Oxygen consumption in cm^3 per hour	Respiratory Quotient
Mouse	20	39	40	0.975 ≃ 1.0 ;
Dog	10000	1960	2800	0.7 ;

a) Complete the table in the last column showing respiratory quotient. (2marks)

b) From the completed table suggest which animal was oxidizing. (2marks)

i)Fats Dog ;

ii) Carbohydrates Mouse ;

4. Name any **one** physiological process in plants that may be affected by dust as a pollutant. (1mk)

Gaseous exchange | Transpiration | Respiration ;

5. a)Name the causative agent for amoebic dysentery. (1mk)

Entamoeba histolytica ; (rules of Binomial nomenclature should be followed)

b) State two preventive measures of schistosomiasis in human beings (2mk)

- Proper (sanitary) disposal of feaces and urine | use of deep pit latrine | flash toilet for disposal of feaces and urine ; Spray water infested with snails with molluscicides ;
- All drinking water boiled | chemically treated to kill the eggs | miracidia | Cercariae
- People should wear protective shoes | water proof shoes | gumboots when walking in water infected with snails | swampy areas (any first 3 ; 3x1=3m

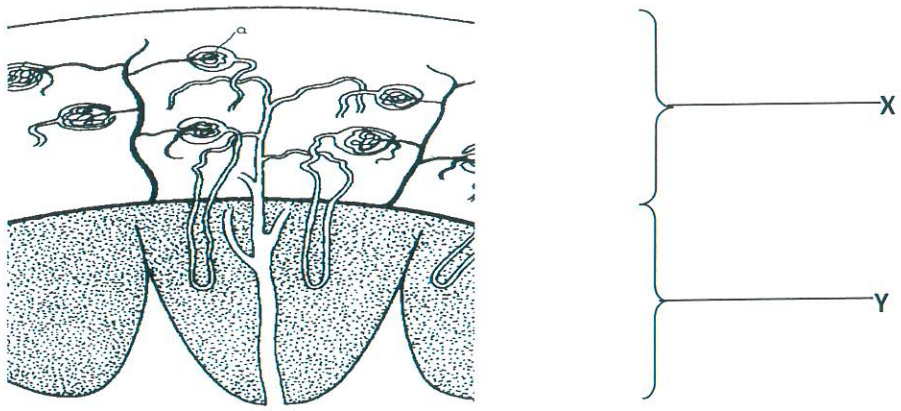
6. a)Name the hormone that stimulate the maturation of the graafian follicles to release a mature ovum in female reproductive cycle. (1mk)

Luteinising hormone (reject LH | wrong spelling)

b) Explain why menstruation does not take place after fertilization in human beings. (2mks)

Due to increased level of Progesterone it inhibits follicle stimulating hormone; from stimulating the maturation of another Graafian follicle;

7. The illustration below shows a transverse section through a mammalian kidney.



(a) Name the structures labelled **X** and **Y**.

X Cortex; (1mk)

Pyramid

Y Medulla; (1mk)

(b) State the process in **Q** that leads to the formation of glomerular filtrate. (1mk)

Ultrafiltration;

8. An experiment was carried out to investigate the rate of reaction shown below.

Sucrose ⟶ Fructose + glucose

For the products fructose and glucose to be formed, it was found that substance **K** was to be added and the temperature maintained at 37°C. When another substance **L** was added, the reaction slowed down and eventually stopped.

(a) Suggest the identity of substance **K** and **L** (2 marks)

K Enzyme (Sucrase/invertase);

L Inhibitor/enzyme inhibitor/acid;

(b) Other than temperature, state three ways by which the rate of reaction would be increased. (3marks)

Addition of sucrose / substrate / increase enzyme concentration;
Provide Optimum/suitable pH;
removal of inhibitors;

9. In an experiment, the concentration of ions in the cell sap of reeds growing in a swampy area and the water in the swamp were determined. The data below was obtained. Study it and answer the questions that follow:

Sample	Na^+	Mg^{2+}	Cl^-	SO_4^{2-}
Cell sap	50	11	101	13
Swamp water	1.2	30	10.2	0.67

a) Name the process by which uptake of the following ions by the reeds occurs. (2 marks)

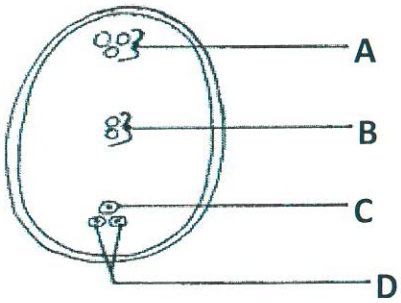
Na^+ ions Active transport

Mg^{2+} ions Diffusion

b) What effect would reduced oxygen supply have on the uptake of sulphate ions? (2 marks) Explain your answer.

Reduces the rate of active transport due to decreased rate of respiration/ oxidation of glucose; hence less energy for active transport;

10. The diagram **below** shows a mature embryo sac of a flowering plant.



(a) Name the parts labeled **A** and **B** (2mks)

A – Antipodal cells
B – Polar nuclei

(b) What is the function of the structure labeled B? (1mk)

Fuses with one male gamete nucleus to form a triploid primary endosperm;

11. State the importance of decomposers in an ecosystem (2mks)

- Detoxicalises nutrients in dead bodies;
- recycle nutrients/breakdown organic matter and release nutrients to the ecosystem;
- Minimize pollution by dead bodies;

12. State the role of the following hormones

(a) Prolactin (1mk)

Stimulates milk production/secretion by Mammary glands;

(b) Oxytocin (2mks)

- Parturition (Birth) / causes muscles ~~to~~ myometrium to contract;
- Milk ejection

* 13. Give a reason why it is difficult to calculate Respiratory Quotient (RQ) in plants. (1 marks)

Carbon(IV) oxide produced in respiration is utilized in photosynthesis; Oxygen produced in photosynthesis is used in respiration

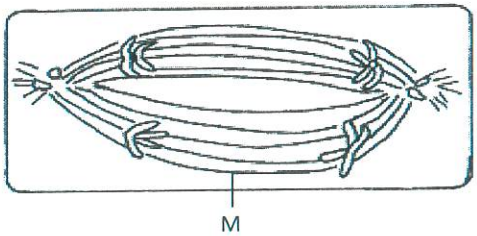
14. List **three** advantages of asexual reproduction in plants. (3 marks)

✓ Favourable characteristics of parents retained;
✓ New plants exploit favourable conditions of parents;
✓ New plants produced in conditions already favourable to parents;
✓ New plants are nourished by parents;
✓ It is independent of two parents/fertilization/pollination
✓ Shorter lifecycles, early maturity/faster colonization/faster reproduction;
✓ Large supply of stored food;
✓ Prevents indiscriminate and widespread distribution of new plants which leads to wastage. (any first 3x1=3)

(15) Distinguish between growth and development. (2mk)

Growth is the quantitative permanent increase in size of an organism while development is qualitative increase in complexity of an organism; (all correct for 1mk)

15. The diagram below represents a stage during cell division.



(a) (i) Identify the stage of cell division. (1 mark)

Anaphase I;

(ii) Give a reason for your answer. (1 mark)

Homologous chromosomes separate at equator;
Chromosomes start migrating to opposite poles;
Sister chromatids attach at the centromere;

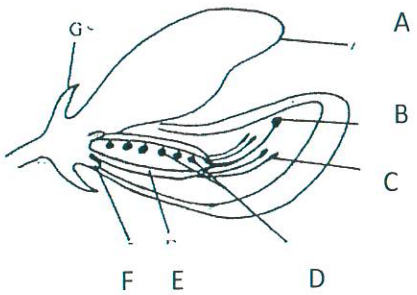
* (b) Name the structures labelled **M**. (1 mark)

Spindle fibres;

16. Explain why there is increased heart beat during vigorous exercise in man. (2 marks)

This is to remove the poisonous lactic acid produced during anaerobic respiration in muscle; and to increase oxygen supply to the tissues;

17. The diagram below shows half a flower.



(a) Identify the structure that develop into a fruit wall after fertilization. (1 mark)

Structure E;

06

(b) Name the structure labelled B and F. (2 marks)

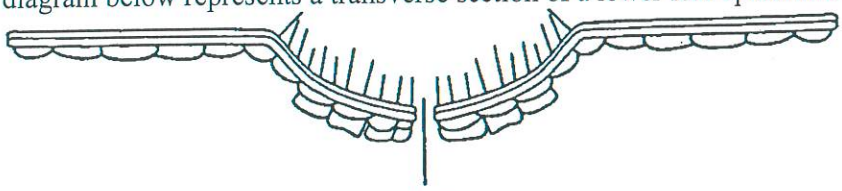
B – Stigma

F – ~~Nectary / nectary glands~~ ovules;

* (c) What is the function of the structure labelled G? (1 mark)

Protect the flower; (during the bud stage)

18. The diagram below represents a transverse section of a lower leaf epidermis of a plant.



a) State two adaptive features shown in the diagram. (2marks)

Sunken stomata; (accumulates humid air which reduces diffusion gradient between inside & outside)

Presence of hairs; (to trap a layer of moisture on the surface thus reducing transpiration)

b) Name the habitat of the plant. (1mark)

Dry / Arid / Semi arid / desert;

19. A farmer accidentally cut his lower part of leg with a hoc while digging. Though the cut was minor, he continued to bleed long after the accident. It was then evident he had deficiency of a certain vitamin and mineral ions.

a) Name the vitamin and the mineral ions . (2mks)

Vitamin ~~K~~ – Vitamin K

Mineral ions – Calcium ions (Ca^{2+}) Rej Ca^{2+}

b) Explain the importance of blood clotting. (2marks)

✓ Prevents excessive loss of blood (when blood vessels are injured;

✓ Promotes healing of wounds / damaged tissue;

✓ Prevents entry of microorganisms;

10

20. To estimate the population size of mosquitoes in shikoti village, Kenya Medical Research Institute researchers caught 400 mosquitoes which they marked and released. After 24 hours 200 mosquitoes were caught out of which 80 had the marks.

a) Suggest the possible instrument that may have been used for capturing the insects. (1 mark)

Sweep nets / Mosquito nets; specimen bottles;

b) Estimate the population size of the mosquitoes in the village. (2marks)

Population = $\frac{\text{First marked} \times \text{Second capture}}{\text{Marked recaptured}}$;

Population = $\frac{400 \times 200}{80}$ = 1000 Mosquitoe;

c) State one assumption that was made during the investigation. (1 mark)

No organism moves in or out of the area between the two counts; Released insects mixed freely; Mark doesn't alter behaviour; Marked animals have enough time to mix with the rest; Population number does not vary during study period;

21. Identify the part of the light microscope which serve each of the functions described below

(i) Making rough focus (1mk)

Course adjustment knob;

(ii) Reflecting light from the source (1mk)

Mirror;

22. State the functions of the following parts of a nephron

(i) Loop of Henle (1mk)

Reabsorption of salts (sodium chloride) into blood;

(ii) Distal convoluted tubule (1mk)

Reabsorption of water into the blood stream;

23. What is the significance of transpiration in plants? (3mks)

✓ Replaces water lost through the leaves;
✓ Through the process, Mineral salts & water are transported in the plant;
✓ it is responsible for turgor in plants;
✓ Helps to removal excess water (especially in aquatic plants)
✓ it serves to cool the plants (a significant factor in hot environments)

11