SUNSHINE SECONDARY SCHOOL

NAME.....Marking scheme.....ADM NO: .....CLASS.....

Candidate's Signature .....Date: .....

BIOLOGY
FORM TWO
(THEORY)
JULY 2019
TIME: 2 HOURS

7 copies

FORM TWO END TERM EXAM

INSTRUCTIONS TO CANDIDATES

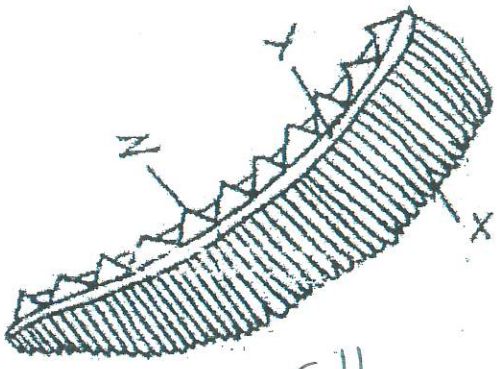
- *Write your name, Admission number and name in the spaces provided above*
- *Sign and write the date of examination in the spaces provided.*
- *Answer all the questions in the spaces provided.*
- *This paper consists of 10 printed pages.*
- *Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing*

For Examiners Use Only

Question	Maximum score	Candidate's score
1- 22	~~75~~ 74	

X/74

1. The diagram below represents an organ of gaseous exchange

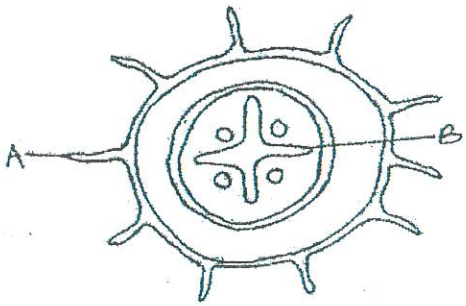


a) What is the name of the organ ....Gill.... (1mk)

b) Name the part labelled Z
~~Name the class to which the animals that have the organ you identified in~~ (a) above belongs (1mk)
Phasmes Gill raker reject rackers

c) State one way in which structures X is adapted for gaseous exchange (1mk)
Thin epithelial lining offers a shorter distance for diffusion of gases, & ANY OTHER

2. The diagram below represents a cross section obtained from a plant. Use it to answer the questions that follow



a) From which part of the plant was the section obtained from (1mk)
ROOT

b) Give a reason for your answer in (a) above (1mk)
— Presence of root hair;
— Star shaped Xylem;
— Presence of endodermis;

5

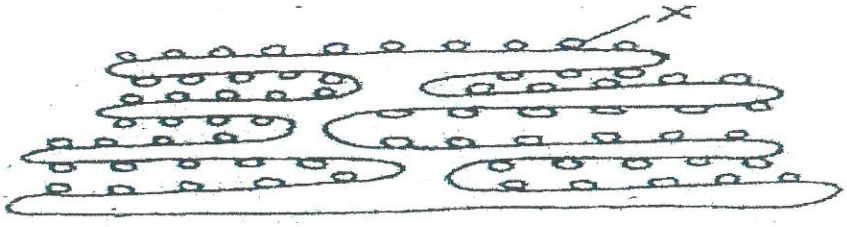
c) Name part B (1mk)

xylem.

d) Name the material that strengthens the part you named in (c) above. (1mk)

Lignin

3. The diagram below represents a cell organelle



i) Name the organelle above (1mk)

Rough endoplasmic ~~end~~ recticulum.

ii) State its function (1mk)

synthesise and transport proteins.

iii) Identify the structures labeled X and state it's functions (2mks)

Ribosome; - site for protein synthesis;

4. How does carboxyhaemoglobin lead to death? (3mks)

Carboxyhaemoglobin is a stable compound; which does not readily dissociate; to release haemoglobin ~~causing suffocation and death~~. This reduces the capacity of blood to transport oxygen; causing suffocation and death;

5 (a) How would you destarch the leaves of a potted plant? (1mk)

Keeping plant in darkness for 48hours;

(b) Which chemical would you use to test for presence of vitamin C in a food substance? (1mk)

DCPIP;

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..... (1mk)

6. Name the processes by which the following enter the root hair cell.

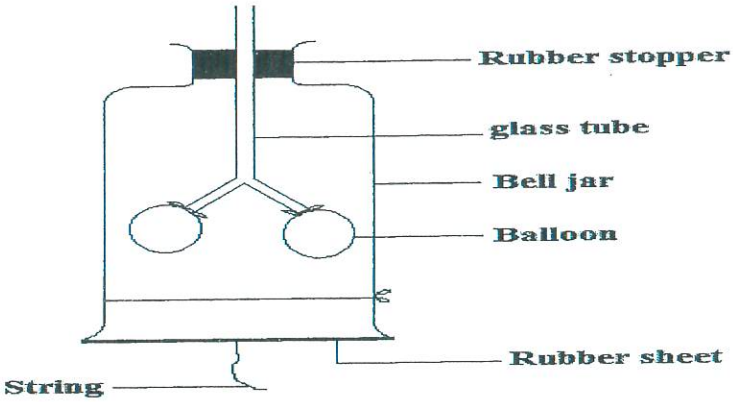
(a) Oxygen. (1 mark)

Diffusion .....

(b) Water. (1 mark)

Osmosis .....

7. Tom, a form two students set up the apparatus shown below to demonstrate the breathing mechanism in a mammal.



(a) What structure in a mammal is represented by each of the following? (2mks)

i) Glass tube

Trachea. .....

ii) Rubber sheet

Diaphragm .....

(b) Explain what will happen to the balloons if the rubber is pulled downwards. (1mk)

Balloon inflates / expand. .....

.....

5

8. a) state the most suitable biological tool for collecting the following organisms:-

i) A moth from a coffee farm. (1mk)

Sweep net

ii) Ants from a tree trunk. (1mk)

Pooter

9. a) An organism was found to have a dental formula

i $\frac{0}{3}$ c $\frac{0}{1}$ pm $\frac{3}{2}$ m $\frac{3}{3}$

i) State the mode of feeding of the organism. (1mk)

herbivorous / herbivory

ii) Give a reason for your answer in (i) above. (1mk)

absence of Canines and incisors on the upper jaw.

10 a) State **one** advantage of double circulation over single circulation. (1mk)

~~effecient~~ in circulation of blood, hence nutrients animal/ organism is active

b) State **two** adaptations of blood capillaries to their functions. (2mks)

(1) One cell thick, thin endothelium for faster absorption/rapid uptake of substance /diffusion of substance

(2) Narrower lumen to generate hydrostatic pressure for ultrafiltration

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11. The oxidation of a certain food is represented by the chemical equation shown below:

$$2\,C_{51}H_{98}O_{6} + 145O_2 \longrightarrow 102\,CO_2 + 98H_2O + \text{Energy}$$

a) Calculate the respiratory quotient (RQ) of the food. (2mks)

$RQ = \frac{CO_2 \text{ produced}}{O_2 \text{ Consumed}}$;

$= \frac{102}{145}$;

$= 0.7$;

b) Identify the food oxidized. (1mk)

Lipid ;

12. List **four** factors that affect respiration (4mks)

(1) Temperature ;

(2) Substrate Concentration ;

(3) Oxygen Concentration ;

(4) Age ; Acc surface area to volume ratio

13. a) Distinguish between excretion and secretion. (2mks)

excretion – removal of toxic/harmful; substances from the body of an organism ;

Secretion – release of useful substances to target organs eg enzymes & hormone ;

b) What is **oxygen debt** as used in respiration (2mks)

Amount of Oxygen required to get rid of accumulated lactic acid in the body tissues ;

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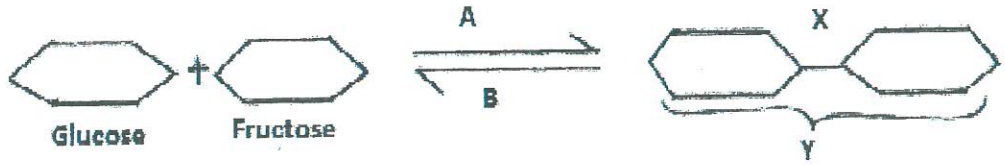
14 .Study the reaction below and answer the questions that follow.



a) What biological processes are represented by A and B? (2mk)

A. Condensation;

B. hydrolysis;

b) Identify the product Y. (1mk)

Dipeptide;

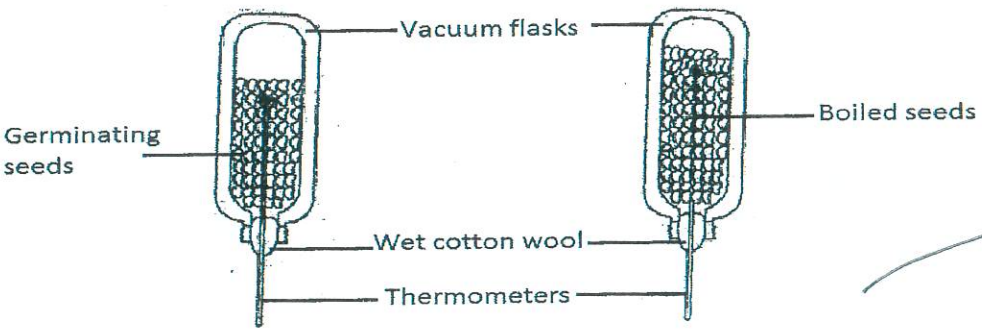
c) State the bond represented by X. (1mk)

Peptide bond;

15. Explain what happens during the light stage of photosynthesis. (3mks)

(1) Light is trapped by chlorophyll pigments;
(2) Light is converted to chemical energy (ATP);
(3) ATP splits down water to Hydrogen ions/atoms and oxygen gas / Photolysis.

16. Students set up the following experiment to investigate an aspect of germination



Flask A **Flask B**

a) What is the aim of the experiment (1mk)

Investigate heat, produced during respiration / Investigate the production of heat by germinating seeds.

b) State the purpose of the vacuum flasks used in this experiment instead of an ordinary flasks. (1mk)

Vacuum flasks retains heat / Conserve heat.

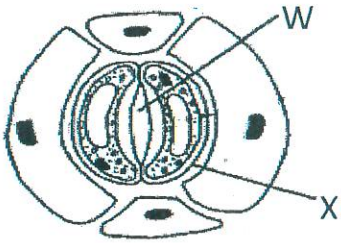
c) Give a reason why seeds in flask **B** were boiled. (1mk)

Boiling denature germination enzymes hence heat is not produced / Kills seeds cells and therefore do not respire

d) After several days, account for the results that will be observed in flask A. (2mks)

Germinating ~~enzymes~~ seeds are highly respiring producing heat, hence rise in thermometer readings.

17. The diagram below shows part of plant tissue.



a) Name cell labelled **X** and part labelled **W**. (2mks)

X Guard cell

W Stoma

b) State **two** adaptations of cell labelled **X** to its function. (2mks)

(1) Uneven thickness of the cell walls (thicker inner wall and thin ~~inflex~~ flexible outer wall) to allow opening of stoma

(2) Bean shaped in structure to allow opening of stoma

(3) Presence of chloroplast, which synthesises glucose that raises osmotic pressure in guard cells

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18. **State** the importance of the following features in gaseous exchange.

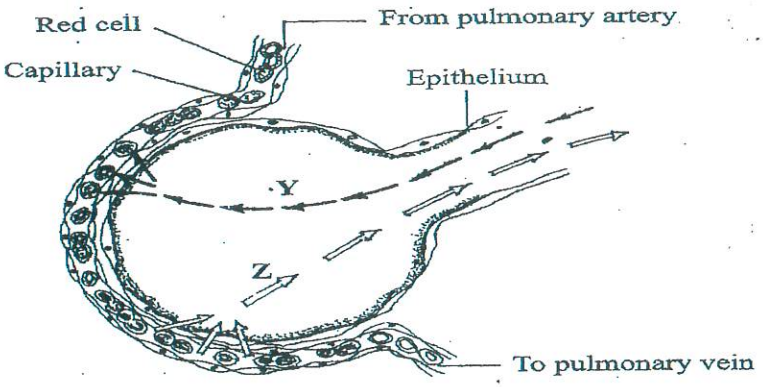
(i) Cartilage in trachea and bronchus. (1mk)

Keeps the trachea open throughout minimising collapse;

(ii) Highly vascularized respiratory surface (1mk)

rapid absorption of gases; / For efficient transp of respiratory gases to and from body tis

19. The diagram below illustrates a blood capillary surrounding a structure for gaseous exchange in human beings.



a) Name the gaseous exchange structure. (1mk)

Alveolus;

b) Identify the gases labeled Y and Z (2mks)

Y Oxygen gas;

Z Carbon (IV) oxide gas;

c) How does labeled Y reach the inside of the blood capillary? (3mks)

Oxygen is of a high concentration gradient in the alveolus sac than blood capillary; Oxygen dissolves in the moist lining of the Epithelium, and diffuses further into the red blood cells; oxygen combines with haemoglobin to form oxyhaemoglobin.

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08

d) How does cigarette smoking lead to lung cancer? (2mks)

Cigarettes contains tar which impairs the functioning of cilia that propel mucus leading to microbial infections that leads to lung cancer

20. Name the respiratory surfaces of the following organisms:

(i) Tadpole External feathery gills (1mk)

(ii) Mosquito larvae Respiratory siphon (1mk)

(iii) Nile Perch gill filaments (1mk)

21. The relative rates of photosynthesis in a certain plant were determined at different temperatures. The results were as shown in the table below.

Temp. ^{0}C	Relative rate of photosynthesis (mg/hr)
25	20
30	70
35	100
40	25

Account for the rate of photosynthesis at

(i) 35^0 C (2mk)

Optimum temperature for photosynthetic enzymes; hence a high rate of photosynthe

(ii) 40^{0}C (2mk)

Temp is too high; denaturing photosynthetic enzym reducing rate of photosynthesis

22. Explain how the following are adapted to their functions.

(a) Chloroplast (1mk)

Grana contain chlorophyll pigments that trap light; ATP strom

(b) Spongy mesophyll cell (1mk)

Loosely packed cells for gaseous exchange