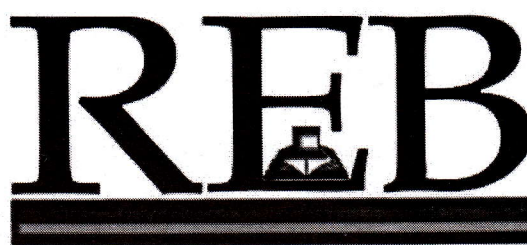


**BIOLOGY AND HEALTH
SCIENCES I**

001

27/11/2018 8.30 AM - 11.30 AM



Rwanda Education Board

ORDINARY LEVEL NATIONAL EXAMINATIONS, 2018

SUBJECT: BIOLOGY AND HEALTH SCIENCES I

DURATION: 3 HOURS

INSTRUCTIONS:

- 1) Write your names and index number on the answer booklet as written on your registration form and **DO NOT** write your names and index number on additional answer sheets of paper if provided.
- 2) Do not open this question paper until you are told to do so.
- 3) This paper consists of **THREE** sections: **A**, **B** and **C**.
Section A: Attempt **all** questions. (55marks)
Section B: Attempt any **three** questions. (30marks)
Section C: This section is **compulsory**. (15marks)
- 4) Use only a **blue** or **black** pen.

SECTION A: ATTEMPT ALL THE QUESTIONS (55 Marks)

- 1) If a nucleus measures 100 mm on a diagram, with a magnification of x 10 000. What is the actual size of the nucleus? **(2marks)**
- 2) How are root hair cells specialized for their role? **(2marks)**
- 3) Match the following cell organelles with their appropriate functions. The first one has been done for you.

Organelles	Functions
(A) Nucleus	(i) Where lipids, including steroids are made.
(B) Mitochondrion	(ii) Controls entry of substance into cell
(C) Plasma membrane	(iii) Controls the activities of the cell
(D) Chloroplasts	(iv) Where polypeptides (Proteins) are made
(E) Smooth Endoplasmic reticulum	(v) Where photosynthesis takes place
(F) Ribosome	(vi) Where aerobic respiration takes place

(5marks)

- (A) ↔ (iii) Example
- (B) ↔
- (C) ↔
- (D) ↔
- (E) ↔
- (F) ↔

- 4) What is the importance of Predator-Prey relationship? **(1mark)**
- 5) Explain how the structure of Arteries, Veins and Capillaries enable them to carry out their functions. **(4marks)**
- 6) (a) In the Food Hygiene regulation of 1990, it is stated that cooked meat products must be stored at a temperature below 8 °C. Explain how this will help to reduce food poisoning. **(3marks)**
- (b) Cooked food such as meat pies, which are being kept warm ready to eat, must be stored at temperatures above 63 °C. Explain how this helps to reduce food poisoning. **(3marks)**
- 7) Experiment on photosynthesis may involve the following:
- (a) Variegated leaves
 - (b) Sodium hydroxide
 - (c) Ethanol
 - (d) Iodine
 - (e) Starch
 - (f) Oxygen

Which would you use to:

- (i) Prevent leaves getting CO₂ ? **(1mark)**
- (ii) Remove chlorophyll from leaves? **(1mark)**
- (iii) Test whether chlorophyll is essential for photosynthesis? **(1mark)**
- (iv) Test decolorized leaf for starch? **(1mark)**

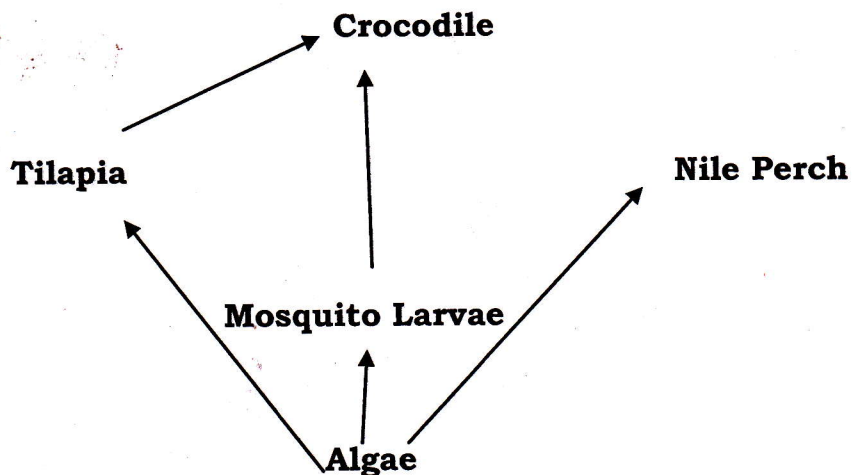
- 8) The table shown below gives the names of certain structures which connect one organ of the human body with another.

Complete the right hand column of the table to show two organs which are connected by each structure. The first one has been done for you.

Structures	Organs Connected by this structure
Bronchus	<u>Trachea</u> with <u>Lungs</u>
Bile ductwith.....
Ureterwith.....
Optic nervewith.....

(6marks)

- 9) The figure below shows an example of a food web.



What would happen if the Nile Perch were removed from the food web?

(2marks)

- 10) A man with blood group B marries a woman with blood group A.
What percentage of offsprings will have blood group O?

Show your working.

(4marks)

11) Match the following organisms using an arrow with the structures for gaseous exchange.

A. Earthworm

i). Tracheoles

B. Amoeba

ii) Alveoli

C. Insects

iii) Gill lamellae

D. Mammal

iv) Cell membrane

E. Fish

v) Skin capillaries

F. Frog

(5marks)

12) Which of the following terms (i) to (v) would you associate with:

(a) Asexual reproduction?

(b) Sexual reproduction?

Terms:

(i) Meiosis

(ii) Identical offsprings

(iii) Spores

(iv) Flowers

(v) A variety of offspring

(4marks)

13) (a) Describe the differences between a parasite and a pathogen. **(2marks)**

(b) List at least one disease caused by each of the following: **(4marks)**

(i) Virus

(ii) Bacteria

(iii) Fungi

(iv) Protoctista

14) Explain the difference between Natural selection and Artificial selection.

(4marks)

SECTION B: ATTEMPT ANY THREE QUESTIONS (30Marks)

- 15) (a) Define "transpiration". **(2marks)**
(b) How do plants benefit from transpiration? **(8marks)**
- 16) (a) Define the term "photosynthesis". **(2marks)**
(b) Describe the conditions necessary for photosynthesis. **(8marks)**
- 17) (a) What are major characteristics of enzymes ? **(5marks)**
(b) Imagine if your stomach pH was 7 instead of the normal pH of 2; what would happen? **(5marks)**
- 18) Many organisms are able to reproduce asexually and sexually. Suggest the advantages of each process. **(10marks)**
- 19) Write short notes on the following biological terms:
- (a) Variation. **(4marks)**
(b) Mutations. **(4marks)**
(c) Adaptive features. **(2marks)**

SECTION C: THIS SECTION IS COMPULSORY (15 Marks)

20) In the tables below, indicate how you carry out tests for reducing sugars and non reducing sugars by filling in the procedure, expected observations and your logical conclusion.

(a) Test for reducing Sugars

Procedure	Observation	Conclusion
(i)		
(ii)		
(iii)		
(iv)		

(b) Test for non-reducing Sugars

Procedure	Observation	Conclusion
(i)		
(ii)		
(iii)		
(iv)		
(v)		
(vi)		

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