

Biology I

001

28/11/2017 08.30 AM - 11.30 AM

REB

Rwanda Education Board

ORDINARY LEVEL NATIONAL EXAMINATIONS, 2017

SUBJECT: BIOLOGY 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 questions. (55marks)

- 1) (a) Give four (4) elements which plants need to produce their food. **(4marks)**
 (b) Plants and animals have a wonderful partnership. What do plants need from animals and what do plants produce that is essential to animals? **(2marks)**

2) Write the appropriate answers required to complete the following sentences:

(Do not copy the sentences in the answer booklet; write the question number (a), b), (c), or (d) and the answers).

- (a) Blood from the body (deoxygenated blood) enters the right side of the human heart through the blood vessel called the **(1mark)**
 (b) The deoxygenated blood is pumped through the pulmonary to the lungs. **(1mark)**
 (c) The oxygenated blood from the lungs enters the heart through the blood vessel called the **(1mark)**
 (d) The oxygenated blood from the heart is pumped to the body through the blood vessel called the **(1mark)**

3) Copy and complete the following table. **(3marks)**

ORGANISMS	KINGDOM
Bacteria
Amoeba	Protista
Mushrooms
Beans	Plantae (Plants)
Man

- 4) (a) Define the following underlined terms:
 (i) Warm-blooded animals. **(1mark)**
 (ii) Cold-blooded animals. **(1mark)**
 (b) Vertebrate animals are divided into five groups or classes: Mammals, Reptiles, Amphibians, Fish and Birds.
 Identify the groups in which the following animals are classified:
 (i) Warm-blooded animals. **(2marks)**
 (ii) Cold-blooded animals. **(2marks)**

- 5) (a) Name the sex chromosomes that are present in a human body cell of:
 (i) a male. **(1mark)**
 (ii) a female. **(1mark)**

(b) Use a Punnet square to show that there is a fifty percent chance that fertilization will lead to a male baby and fifty percent chance that it will lead to a female baby. **(3marks)**

6) (a) Write the dental formula of an "adult human being". **(2marks)**

(b) Suggest two (2) practices that favour good functioning of the human digestive system. **(2marks)**

7) Explain how the information about a sharp object injuring the skin reaches the human brain. **(3marks)**

8) Give at least three functions of a human skeleton. **(3marks)**

9) Match the following organs of the urinary system to their function by writing the letter of the organ and the letter for the corresponding function: **(4marks)**

<u>Organ</u>	<u>Function</u>
A. Ureter	a) Where urine is produced.
B. Kidney	b) Urine is stored here.
C. Urethra	c) Brings urine from the kidneys to the bladder.
D. Urinary bladder	d) Urine is eliminated from the body through this tube.

10) (a) Give one location in a seed in which food is stored. **(1mark)**

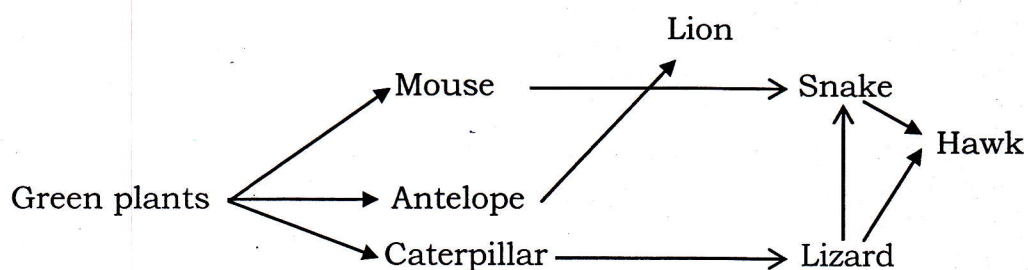
(b) What type of seed germination is observed in:
(i) Bean seeds? **(1mark)**

(ii) Pea seeds? **(1mark)**

(c) Differentiate the two types of seed germination you have given in (b)(i) and (b)(ii) above. **(2marks)**

11) Water has many functions in the human body. State three of these functions. **(3marks)**

12) Study the following food web.



(a) Give a name of one secondary consumer. **(1mark)**

(b) What would happen if the lions were attacked by a strange disease and died in large numbers? **(2marks)**

- 13) (a) In human males, sperm cells are suspended in a fluid medium. What is the main advantage gained from suspending the sperm cells in a fluid medium? **(1mark)**
- (b) Name the structure that serves as the exchange surface for nutrients, wastes and oxygen between mother and fetus in human females. **(1mark)**
- (c) Match the following terms with their functions by writing the Roman number of the term and the letter for the corresponding function : **(4marks)**

<u>Terms</u>	<u>Functions</u>
I. Oviduct	A. is an adaptation for internal fertilization.
II. Penis	B. is the site of internal fertilization.
III. Ovary	C. produces testosterone
IV. Testes	D. produces estrogen and progesterone

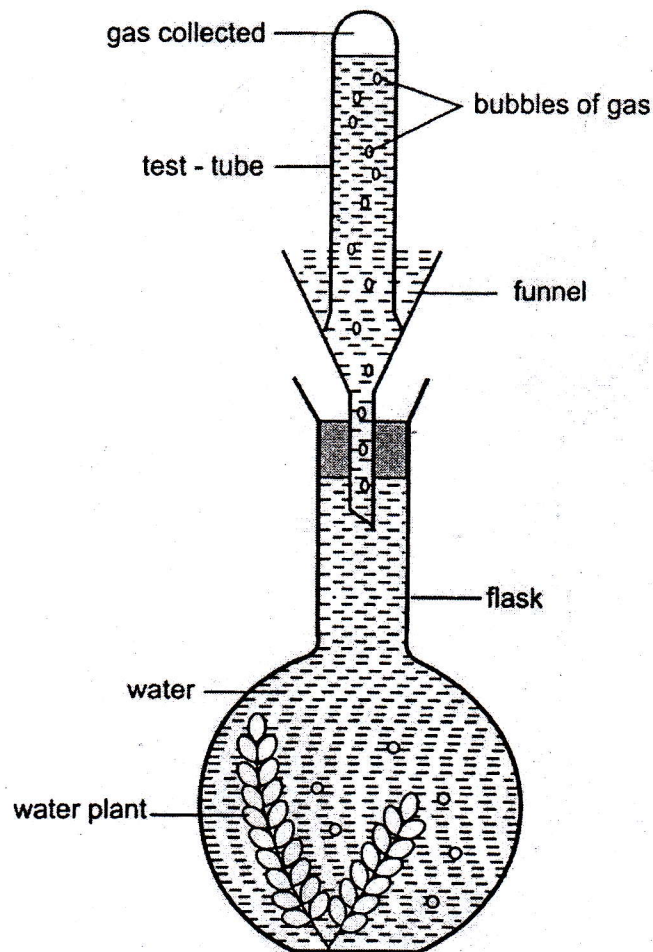
SECTION B: ATTEMPT ANY THREE QUESTIONS. (30 marks)

- 14) (a) State the term used to describe the genetic condition in an organism whose cell nuclei contain pairs of identical alleles. **(2marks)**
- (b) A farmer has cattle in which the polled (**P**) condition (absence of horns) is dominant to the horned (**p**) condition. A heterozygous polled bull was crossed with homozygous horned cow.
- (i) What is the genotype of the parents? **(1mark)**
- (ii) What are the possible gametes that can be produced by the parents? **(2marks)**
- (iii) Find the possible genotypes and phenotypes of the calves that may result from this cross. **(5marks)**
- 15) (a) How can you identify living things (organisms)? **(6marks)**
- (b) Micro-organisms are useful and harmful to man. Explain this statement with examples. **(4marks)**
- 16) (a) What is an Antigen? **(1mark)**
- (b) There are four (4) blood groups in humans: **A, AB, B** and **O**. From these blood groups, show the possible blood compatibility for transfusion. **(9marks)**
- 17) (a) Explain how the algae reduce the pollution in aquatic (water) areas. **(2marks)**
- (b) State at least two harmful effects of algae. **(2marks)**
- (c) Show how the following non-flowering plants are important: **(3marks)**
- (i) Fungi **(3marks)**
- (ii) Pteridophytes **(3marks)**

- 18) (a) Describe one method that can be used to prevent sexual transmission of HIV/AIDS. **(2marks)**
- (b) Give three (3) ways in which a woman who has HIV can pass the virus to her baby. **(3marks)**
- (c) Mention at least five (5) categories of people who are at risk of getting HIV. **(5marks)**

SECTION C: THIS SECTION IS COMPULSORY (15marks)

- 19) Students carried out an experiment below to investigate how a gas is given out during a biological process.



- (a) Give the name of the gas that is collected in the test-tube? **(2marks)**
- (b) Where does the gas in 19 (a) above come from? **(2marks)**
- (c) During which process is the gas in 19 (a) above produced? **(2marks)**
- (d) Write four (4) conditions under which the mentioned gas in 19 (a) is produced. **(4marks)**
- (e) What will happen if the apparatus used is kept in a dark place? **(2marks)**
- (f) Explain why the process given in 19 (c) above may be reduced if there is a deficiency in magnesium ions. **(3marks)**