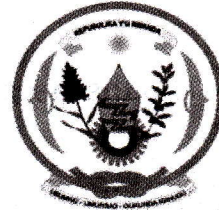


Biology I

001

07 Nov. 2011 8.30am – 11.30 am

REPUBLIC OF RWANDA



**RWANDA EDUCATION BOARD (REB)
P.O.BOX 3817 KIGALI. TEL/FAX: 586871**

ORDINARY LEVEL NATIONAL EXAMINATIONS 2011

SUBJECT : BIOLOGY I

DURATION : 3 HOURS

INSTRUCTIONS:

This paper consists of **Three** sections: **A** and **B** and **C**

Attempt **all** questions in section **A**.

(55 marks)

Attempt **any three** questions in section **B**.

(30 marks)

Attempt **only one** question in section **C**.

(15 marks)

SECTION A: Attempt all questions from this section. (55 marks)

1. (a) Name any two diseases caused by a virus. **(2 marks)**

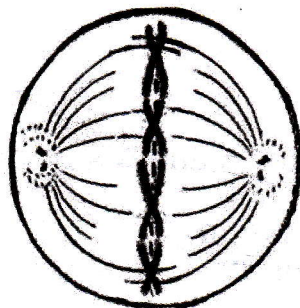
(b) A virus is described as a living and non-living organism.
Explain why. **(2 marks)**

2. The following are parts of an organism: cell, organ, gene, tissue, chromosome, system.
Arrange them in an increasing order of their size (i.e. from the smallest to the largest). **(6 marks)**

3. (a) What is the function of each of the following cell organelle?
(i) Mitochondrion. **(1 mark)**
(ii) Chloroplasts. **(1 mark)**
(iii) Golgi apparatus. **(1 mark)**
(iv) Endoplasmic reticulum. **(1 mark)**

(b) Give at least two similarities between an animal and a plant cell. **(2 marks)**

4. The figure below shows one of the stages of mitosis of cell division.



(a) Which stage is represented in the figure? **(1 mark)**

(b) Describe the behaviour of chromosomes in this stage. **(2 marks)**

5. (a) Name different blood groups. **(2 marks)**

(b) What are the blood groups of:

(i) Universal donor? **(1 mark)**

(ii) Universal recipient? **(1 mark)**

6. (a) What are functions of the stomach in the digestion of man? **(2 marks)**

(b) Explain why carbohydrates are not digested in the stomach. **(2 marks)**

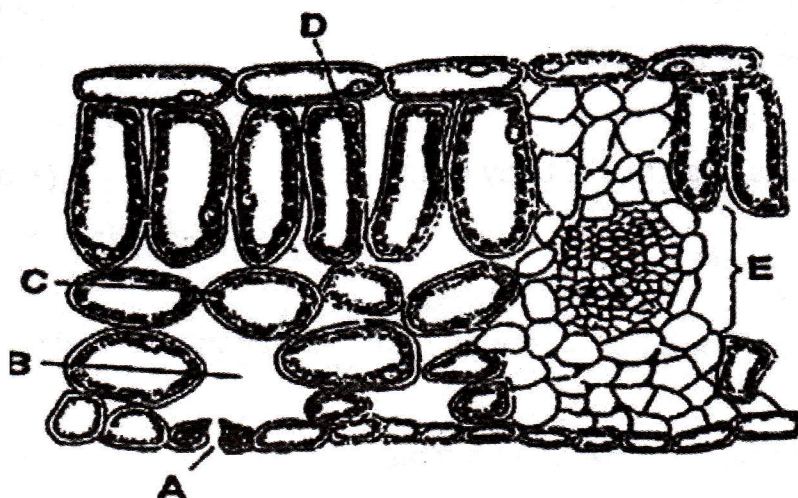
7. (a) Describe blood functions in a mammal. **(3 marks)**

(b) Give **ONE** reason why blood in arteries has high pressure than in veins. **(1 mark)**

8. (a) What features (adaptations) of fish enable it to live in water? **(2 marks)**

(b) Why does fish die immediately it is removed from water? **(2 marks)**

9. The figure below shows a cross section of a green leaf.



(a) Identify the structures labelled A, B, C and D. **(4 marks)**

(b) What is the function of structures A and D respectively? **(2 marks)**

10. Explain the following biological statements.

(a) Green plants manufacture their own food. **(1 mark)**

(b) Animals are heterotrophic organisms. **(1 mark)**

(c) There is no photosynthesis in plant roots. **(2 marks)**

11. The chromosomes for determining the human sex are labelled X and Y.

		Parent 1	
		(X)	(X)
Parent 2	(X)		
	(O)		

(a) Complete the punnett square to show the genotype of

(i) parent 2

(ii) and of four offsprings.

(5 marks)

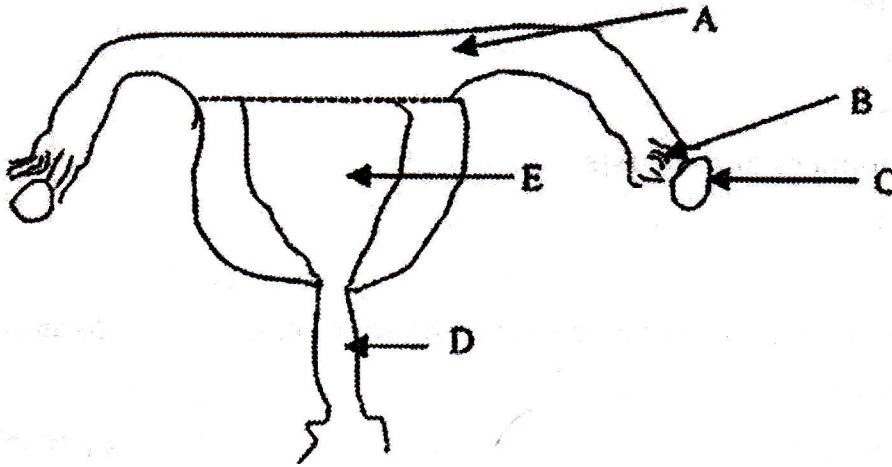
(b) Which parent is the mother?

(1 mark)

(c) What are chances of getting a baby girl?

(1 mark)

12. Examine the figure below and answer the questions that follow.



- (a) What does this figure represent? **(0.5 mark)**
(b) Name the parts labelled A, B, C, D and E. **(2.5 marks)**

SECTION B: Attempt any THREE questions only. (30 marks)

13. The government of Rwanda has set up several organizations to fight against AIDS.

- (a) What is AIDS in full? **(1 mark)**
(b) What causes AIDS? **(1 mark)**
(c) How is AIDS spread from one person to another? **(3 marks)**
(d) Suggest at least five possible methods which you can use to prevent the spread of AIDS. **(5 marks)**

14. The following organisms were found abandoned in AKAGERA

National Park in Rwanda:

- Green plants
- Hawks
- Lizards
- Grasshoppers and locusts
- Snakes.

(a) Construct the food chain to show their feeding relations. **(4 marks)**

(b) Which organisms are :

- (i) Herbivores? **(1 mark)**
- (ii) Tertiary consumers? **(1 mark)**
- (iii) Top carnivores? **(1 mark)**
- (iv) Producers? **(1 mark)**

(c) What effect would the removal of grasshoppers and locusts have on other organisms? **(2 marks)**

15. (a) Draw a well labelled diagram of an external structure of a green plant leaf. **(5 marks)**

(b) One of the functions of a leaf is to carry out photosynthesis. How is a leaf adapted for this function? **(5 marks)**

16. (a) Define the term Photosynthesis. **(2 marks)**

(b) What are necessary conditions for photosynthesis to take place? **(4 marks)**

(c) What factors may affect the rate of photosynthesis? **(4 marks)**

17. a) Define the term "Digestion". **(1 mark)**
(b) Name any three protein digesting enzymes. **(3 marks)**
(c) Mention any six healthy nutritional habits we are advised to practice. **(6 marks)**

SECTION C: Attempt only ONE question. **(15 marks)**

18. The government of Rwanda has established a parastatal body called RWANDA ENVIRONMENTAL MANAGEMENT AUTHORITY (REMA) to fight against the destruction of our environment.

(a) In what ways is our environment being destroyed? **(5 marks)**

(b) Suggest all possible ways it has put forward to conserve our environment. **(10 marks)**

19. (a) (i) Define the term Osmosis. **(3 marks)**

(ii) Explain why osmosis is considered as a special case of diffusion. **(2 marks)**

(b) Senior three students in a Secondary School in Rwanda carried out an experiment to demonstrate (show) the process of osmosis.

(i) Suggest possible apparatus and substances (chemicals) they are likely to have used. **(4 marks)**

(ii) What observations are they likely to have noticed at the end of the experiment? **(4 marks)**

(iii) Explain these observations. **(2 marks)**