

Biology I

001

07 Nov. 2011 8.30am – 11.30 am

REPUBLIC OF RWANDA



RWANDA EDUCATION BOARD (REB)
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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)**

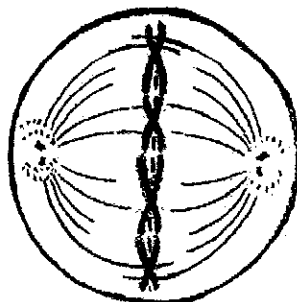
2. The following are parts of an organism: cell, organ, gene, tissue, chromosome, system.
Arrange them in an increasing order of their size (i.e. from the smallest to the largest). **(6 marks)**

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)**

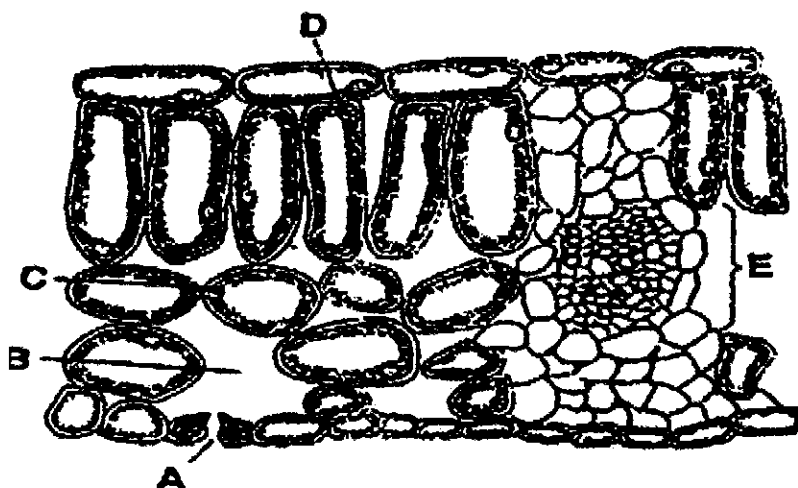
4. The figure below shows one of the stages of mitosis of cell division.



(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)		
	()		

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

(i) parent 2

(ii) and of four offsprings.

(5 marks)

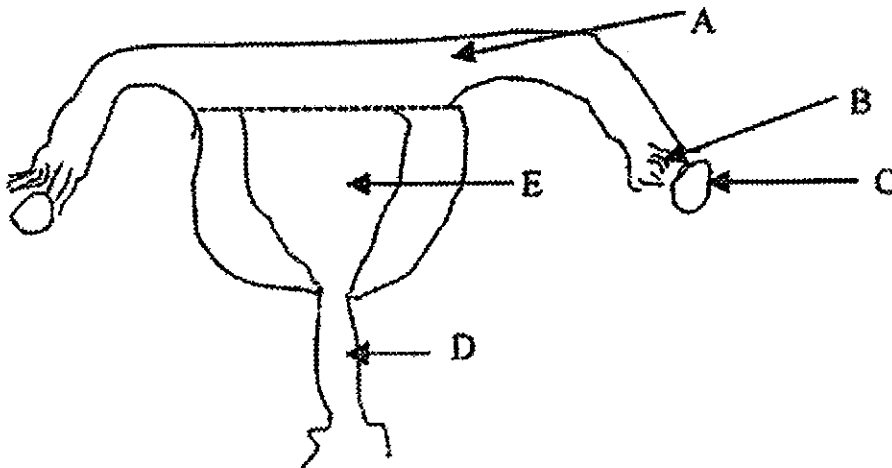
(b) Which parent is the mother?

(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)**

