

École des Sciences de MUSANZE

HOME WORK FOR ALL SENIOR THREE

BIOLOGY WORK N^o 1

SECTION A

1. Match the description in Column A with the correct term in Column B.

Column A	Column B
1 Toxic	A. Excretion
2 Making energy from carbon dioxide and water in plants	B. Poisonous
3 Getting rid of waste substances	C. Variety of living organisms
4 Responding to the environment	D. Respiration
5 Using food molecules and oxygen to get energy	E. Photosynthesis
6 Biodiversity	F. Reproduction
7 Producing offspring	G. Sensitivity

2. Name the five kingdoms of organisms.

3. Identify the kingdom to which each of the organisms described belongs.

a. It has a cell wall and chloroplasts.

b. It is a single cell.

c. It reproduces by means of spores.

4. Arrange the classification groups below into the correct order. Start with the group that contains the smallest number of organisms.

family species order genus phylum kingdom class

5. Put the following terms in the correct order: **germination, seed dispersal, fertilisation, pollination.**

a) A plant has a tap root, two cotyledons and a flower with eight petals.

Is this a monocotyledonous or a dicotyledonous plant?

b) Give any four differences between monocotyledonous and dicotyledonous plants

7. a) What is the function of sperm cells?

- b) List three ways in which sperm cells are suited to their function.
8. Name two animal tissues and two plant tissues.
9. Name the reagents that are used to test for the presence of the following in a food sample:

a. proteins

b. starch.

10. What are the tiny sacs in the lungs called?

A bronchi

B alveoli

C capillaries

11. . What happens during gas exchange in the lungs?

A Oxygen passes into the blood and carbon dioxide passes out of the blood.

B Oxygen passes out of the blood and carbon dioxide passes into the blood.

C Oxygen and carbon dioxide pass into the blood.

12. Which structures does the trachea lead to in the lungs?

A pleural membranes

B bronchioles

C Bronchi

13. The alveoli are suited for gas exchange because they have:

A a small surface area

B a large surface area

C walls that are many cells thick

14. The cilia in the air passages:

A trap dust

B trap bacteria

C trap dust and bacteria

15. Complete the sentences below using these words: **towards, phototropism, roots, stimulus, negatively.** /5

a) The growth of a stem _____ or away from a light _____ is called _____.

b) Plant stems are _____ gravitropic.

c) Plant _____ are positively gravitropic.

16. a) Name two female reproductive hormones.

b) In which part of the female reproductive system are these hormones produced?

17. Give a reason for each of the following:

a. the uterus has powerful muscles

b. the oviducts are lined with ciliated epithelium.

18. Consider this food chain

Grass → Grasshopper → Birds

a. The birds in this food chain are:

i. Producers

iii.

Secondary consumers

ii. Primary consumers

iv.

Tertiary consumers

b. If a disease killed all the birds, what effect will it have in this food chain?

19. A vulture feeds on dead bodies of animals. The vulture is best described as:

a. An omnivore

c.

A decomposer

b. A carnivore

d.

A scavenger

20 . Which of the statements below about osmosis is true?

- A. The greater the solute concentration, the smaller the osmotic pressure.
 - B. Osmosis occurs due to hydrostatic pressure outside the cell.
 - C. Osmosis moves water molecules from a greater solute solution to a lesser solute concentration.
 - D. The higher the osmotic pressure of a solution, the greater the tendency of water to move into the solution.
21. One of the following transports manufactured food away from the leaves. Which one is it?
- a. Xylem
 - b. Phloem
 - c. Petiole
 - d. Epidermis

SECTION B (Open questions)

1. The graph below shows the population growth curve of Rwanda from 1961 - 2003. Study the graph and use it to answer the questions that follow.

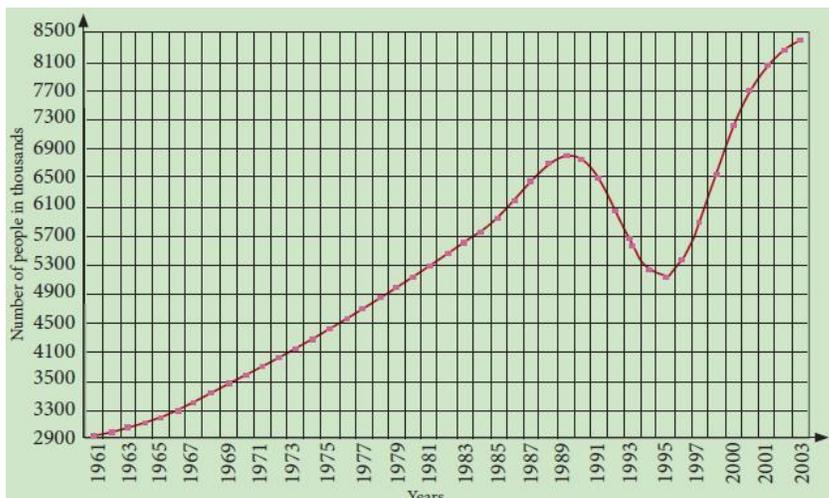
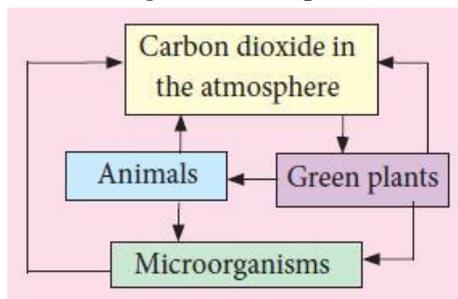


Figure: Rwanda population growth curve

- (a) Describe the shape of the graph.
- (b) What can you attribute the increase in population to?
- (c) What do you think caused a decline in population as shown on the graph?
- (d) What can you do as an individual to prevent (c) above from

2. The diagram shows part of the carbon cycle.



- a) Describe how living things are involved in the constant cycle of carbon
 b) Which activity will add more carbon dioxide into the atmosphere and why?
 A. Combustion of fossil fuel
 B. Animals breathing in
 C. Decay of plants
 D. Volcanic activity

c) Suggest alternative forms of energy to be used rather than fossil fuels.

3. You are a member of the environment club in your school.

(a) What is the importance of being a member of a club in school?

(b) How can you impact your community with the knowledge obtained from the club activities?

4. a) Explain how pollution affects our country.

b) Which form of pollution is widespread in Rwanda?

c) What should we do to increase awareness about environmental pollution?

5. Explain the reasons for habitat destruction.

6. a) Suggest ways you as an individual can help conserve endangered species.

b) Which human activities can lead to species extinction

BIOLOGY WORK N^o 2

□

SECTION A: Answer to all questions

1. If one of your parents is blood type A and the other is type B, which of the following blood types are you likely to be?

- A. A B. B C. AB D. O

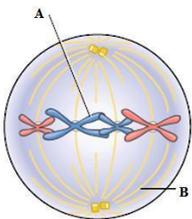
2. The spleen is a lymph organ that filters blood and acts as a reservoir for _____. A. water B. fat

3. What is the main cellular structure involved in respiration?

- A. Nucleus
 B. Golgi apparatus
 C. Mitochondrion
 D. Cytoplasm

4. a) Why would you expect to find abundant rough ' endoplasmic reticulum in the pancreas?/2 b) Why do we stain biological sections when observing under a microscope?

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



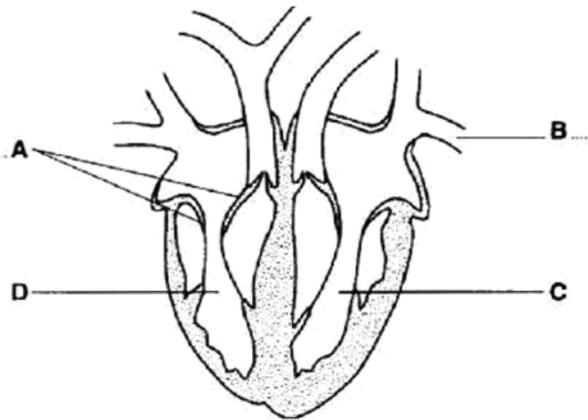
- a) Which stage is represented in the figure?
 b) Names the structures A and B.
 c) Describe the behaviour of chromosomes in this stage

7. 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 duct	.....with.....
Ureter	.....with.....
Optic nerve	.....with.....

8. The figure below shows a section through the heart.



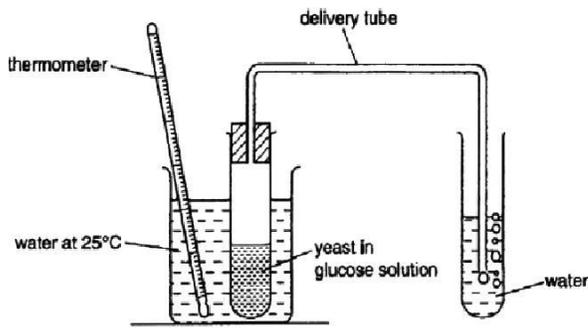
- i) Shade the cavity of the ventricle which contains oxygenated blood
- ii) Suggest why the wall around chamber C is much thicker than that around chamber D.

9. Of what advantage is it for a red blood cell to:

- (i) have a biconcave disc shape?
- (ii) have haemoglobin?
- (iii) lack a nucleus?

10. Water has many functions in the human body. State three of these functions

11. The figure below shows the apparatus that was used to investigate the activity of yeast in a glucose solution.



The number of bubbles released in one minute was counted. This was repeated another four times.

The temperature in the water bath was then raised to 35 °C and five more counts were made.

	number of bubbles released in one minute	
	25 °C	35 °C
1	11	17
2	12	19
3	14	20
4	13	16
5	10	18
total		
mean (average)		

- (i) Complete the table to show the **totals** and **mean** (numbers of bubbles released at each temperature).
- (ii) Name the physiological process in yeast which is investigated in this experiment.
- (iii) State the effect of raising the temperature on the activity of yeast.
- (iv) Name the gas present in the bubbles.

12.(a) Describe blood functions in a mammal.

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

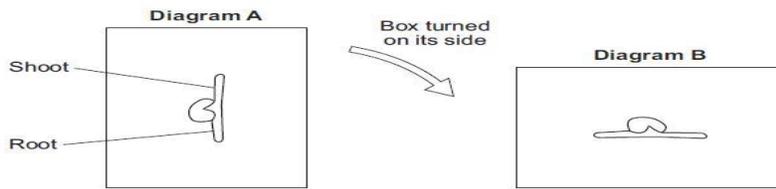
13. The following are various sub-units into which species of plants or animals can be divided: **cell, organ, organelle, organism, tissue, organ system.**

(a) Arrange them in order starting with the simplest and ending with the most complex. Which of them can be applied to the following:

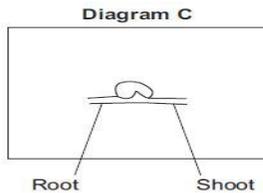
(i) A cat? **(ii)** Amoeba? **(iii)** Leaf **(iv)** Chloroplast? **(v)** Alimentary canal?

14. a) Give four (4) elements which plants need to produce their food

15. A student investigated growth responses in plants. The student grew a bean seed in a box filled with moist soil, as shown in **Diagram A**. After the seed had started to grow, the box was turned onto its side and placed in a dark room, as shown in **Diagram B**.



(a) Complete **Diagram C** to show what the root and shoot will look like three days later.



(b) Draw a ring around the correct answer to complete the sentence. The results of the

investigation show that

Light
Moisture
gravity

to

16. a) list 3 types of skeletons

b) State any 3 functions of the human skeleton/3

17.a) In which cells (body or sex cells) does mitosis occur and how similar are the cells produced?

a) What is the goal of mitosis (what are the cells that are produced used for)?

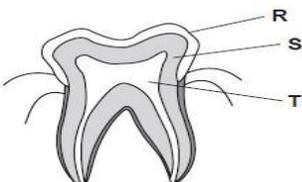
b) If a diploid cell with 18 chromosomes completes mitosis how many chromosomes will each of the daughter cells have?

c) i) Define the term homologous chromosomes. Where do they come from?

ii) How similar are they and what are the differences between them called?

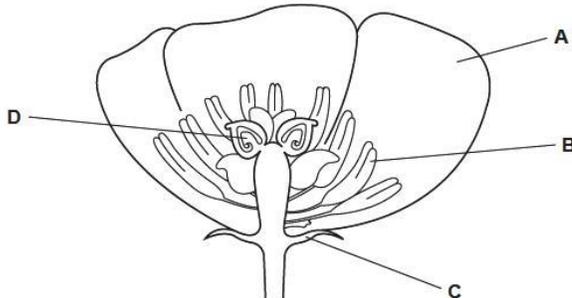
iii) How do the terms diploid and haploid relate to homologous chromosomes? Define each term

18. The teeth are involved in physical digestion. The figure shows a section through a tooth.



- (i) Name a mineral that is required for the development of healthy teeth.
- (ii) Name the parts labelled **R**, **S** and **T**

19. The figure shows a section through an insect-pollinated flower.



(a) Name the parts labelled A, B, C and D

(i) Define the term pollination.

(ii) Pollination can be carried out by insects or by wind. Describe four features of flowers that would show they are insect-pollinated.

(b) Wind-pollinated flowers produce much more pollen than insect-pollinated flowers. This pollen is usually lighter than pollen from insect-pollinated flowers. Suggest why these are advantages to a plant that is wind-pollinated.

BIOLOGY WORK N⁰³

SECTION A: ANSWER ALL QUESTIONS

- 1) Give any pollination agents/3
- 2) Draw the female and male reproductive system in flowering plants
- 3) Differentiate mechanical from chemical respiration
- 4) Differentiate monocotyledons from dicotyledons
- 5) Compare eukaryotic cell and prokaryotic cell
- 6) Amoeba is a single celled organism which live in water .describe how it feeds.
- 7) a) Mammals have a double circulation .What does this mean?
b) Explain why large organisms need a circulatory system
- 8) The following interconversions take place during metabolism of carbohydrates in human body
- 9) Glucose $\xrightarrow{\hspace{2cm}}$ glycogen
 $\xleftarrow{\hspace{2cm}}$

- a) In which organ the reaction takes place?
- b) Name two hormones that are involved in this reaction

c) What is the effect of excess glucose in the blood

10) Complete the table below :

Site of human gut	Enzyme	Role in digestion
1..... ...	.....	Break down starch into maltose
2..... ....	.....	Break down proteins into peptides
3.Duodenum	Pancreatic lipase	.....
4.Ileum	Maltase	.....
	Peptidase	.....

11.

a)distinguish between endocrine and exocrine glands/3

b)list any five endocrine glands and hormones they produce/5

12. In a breeding experiment with garden peas ,a sample of plants with white flowers was crossed with a sample of plants which produce red flowers.when the seeds produced were t grown all the resulting F1 generation produced red flowers.

i) Why were no white flowers produced by plants belonging to the F1 generation.

ii)Using genetic symbols,explain what would result from interbreeding the F1 generation

SECTION B

Attempt any three questions in this section

1) a)Compare mitosis and meiosis

b) Give any 3 roles of meiosis

2) Describe digestion process in human

3) a) Describe the different types of carbohydrates giving examples of each type

b)You are provided with a solution which is suspected to contain reducing sugar. Describe the possible tests you can carry out to confirm that it is a reducing sugar.

4) a)describe the composition of blood

b) Explain how blood cells transport oxygen

c) How are blood cells adapted to transport oxygen

d) Explain why animal cells burst when in water but plant cells not

5) a)what is the role of the following flower parts in the reproduction of the flower. i)petals ii)stamens iii)carpels

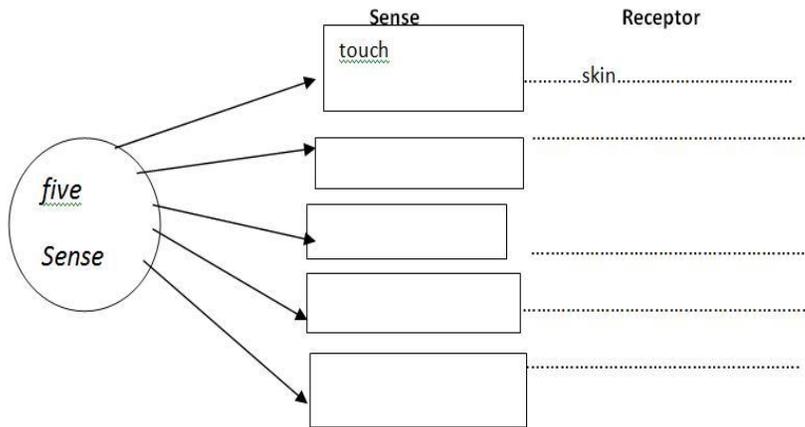
b) Briefly describe the process of fertilization in plants.

SECTION C

Attempt only one question

- 1) In relation to flowering plants explain what is meant by vegetative propagation.
- (ii) Clones are genetically identical individuals. Are the products of vegetative propagation clones? Explain your answer.
- (iii) Give **two** examples of natural vegetative propagation that involve different parts of a plant.
- (iv) Describe **two** techniques of artificial vegetative propagation that are used for flowering plants. Suggest a benefit of artificial propagation.

2) **a)** Human has a number of senses, for example touch ,senses are detected by receptors for example skin detects touch. In the box below write the names of other senses .by each box writes the name of the receptors.



- b) When your hand is touched, the information is passed to your brain. Describe how the information gets from your skin to your brain.
- c) Draw a well labeled motor neuron and distinguish it with sensory neuron by means of their action mode.

GOOD LUCK