BIOLOGY ND HEALTH SCIENCES **REPUBLIC OF RWANDA**

DATE: …March 2025 **SOUTHERN PROVINCE**

KAMONYI DISTRICT

HOLYDAYS WORK, SCHOOL YEAR 2024-2025

GRADE: S_3

COMBINATION: O'LEVEL

MARKS: ……/100

INSTRUCTIONS:

1. Write your names correctly

2. This paper consists of **three** sections **A**, **B** and **C**

- **Section A:** Attempt **ALL** questions. **(55 marks)**
- **Section B:** Attempt any **THREE** questions **(30 marks)**
- **Section C:** This section is **Compulsory (15 marks)**

3. Use only a **blue** or **black** pen

Section A: Attempt ALL questions (55 marks)

1. What does **CNS** refer to? **(2marks)**

a) The central nervous system consisting of the brain and spinal cord
b) The cerebral nervous system consisting of the brain, spinal cord and retinas
c) The central nervous system consisting of the brain and motor neurons
d) The cerebral nervous system consisting solely of the brain

2. Which of the following statements best describes dispersal? **(2marks)**

a) A seed growing into a new plant
b) A seed starting to sprout
c) The scattering of seeds to other places away from the parent plant

3. Flexing of the forearm is brought about by_____**(2marks)**

a) Relaxation of both biceps and triceps
b) Contraction of the biceps and relaxation of the triceps
c) Contraction of both biceps and triceps
d) Relaxation of the biceps and contraction of the triceps.

4. The male sterilization operation known as vasectomy is carried out by **(2marks)**

a) Removing the testis
b) Cutting the scrotum
c) Tying the vas deferens
d) Blocking the ureter

5. Which hormones are present in implants? **(2marks)**

a) Testosterone
b) Progesterone
c) FHS
d) LH

6. Movement in the small intestine that churn the materials being digested and mix them with intestinal secretions are called. **(2marks)**
   a) churning
   b) Peristalsis
   c) pendular motility
   d) segmentation
7. What is the result of a rise in body temperature? **(2marks)**
   a) A decrease in the production of sweat
   b) An increase in blood flow to the skin
   c) Narrowing of blood vessels in the skin
   d) Raising of hairs on the skin
8. State whether each of the following statements is **true** or **false (5marks)**
   a) Mature red blood cells lack nuclei.
   b) Aerobic respiration is the release of energy in the absence of oxygen.
   c) All organisms require oxygen in order to respire.
   d) All living organisms reproduce by asexual reproduction
   e) Invertebrates are animals that lack backbones
9. Fill the blank spaces in the paragraph below with a word from the following list:

lungs, ultrafiltration, Kidney, liver, waste, respiration.

Write the full paragraph and underline the added word (**6marks)**

Excretion involves the removal of ----------products from the body. Urea is produced by the……. during ……while carbon dioxide is a waste product of ……. Nitrogenous waste products are excreted by the..... while carbon dioxide is excreted by the ……

10. Match each animal's common name with its scientific name. To help you, here are some Latin words translated into English: *Mel* = honey; *taurus* = bull; *terra* = earth; *sapiens* = wise **(6marks)**

Common name Scientific name	**Common name Scientific name**
Honeybee	*Diceros bicornis*
Rhinoceros	*Apis mellifera*
Cow	*Lumbricus terrestris*
Earthworm	*Bos taurus*
Lion	*Homo sapiens*
Human	*Panthera leo*

11. The students did some food tests on a sample of food and then recorded their results in the below table.

Name of reagent used	**Colour before test**	**Colour after test**
Iodine solution	Orange	Blue-black
Ethanol	Clear	Clear
Sodium hydroxide and Copper (II) sulphate	Blue	Purple

   a) Which food nutrients are present in the sample**? (2 marks)**
   b) Which food nutrients absent from the sample**? (1 mark)**

12. Why is it important to include leguminous crops in a farm? **(1 mark)**

13. . What is the difference between physical and chemical digestion? **(2 marks)**

14. The outer layer of the crown of a tooth is resistant to attack by bacteria.

a) Name this outer layer. **(1 mark)**

b) State the minerals and the vitamins needed in the diet for the healthy development of this layer. **(2 marks)**

15. Halophytes are found in salty environments. How do they avoid having too much salt in their tissues? **(2marks)**

16. Differentiate between the first and second line of defense system in the human body **(2marks)**

17. Maliza has refused to take his baby for vaccination against polio. His friend Makanyaga told him that polio vaccines are laced with a virus to control population. **(2marks)**

a) Were his concerns true?

b) What would you advise him to do?

18. a) Insulin hormone is used to manage diabetic condition. Suggest reasons why insulin is not taken orally during its administration. **(2 marks)**

b) Why do diabetic patients often undergo dietary sugar restriction? **(2 marks)**

19. State the scientific terms that fit the following definitions. **(3 marks)**

a) The sac of skin located outside the body wall in which the testes are located

b) The tube with a funnel-like end in which the released ovum from the ovary enters

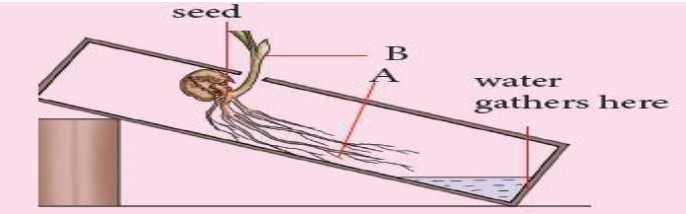
c) The birth canal

20. What is a conditioned reflex? **(2marks)**

Section B: Attempt any THREE questions (30 marks)

21. By using a table, give the differences between asexual and sexual reproduction. **(10marks)**

22. The diagram shows a young plant growing in a tilted seed box.



a) Name the growth response shown by A. **(1mark)**

b) Name the growth response shown by B. **(1mark)**

c) Suggest the benefit to the plant of the growth response shown by **B. (2marks)**

d) Give an example of a regulator in plants that inhibits growth. **(1mark)**

e) Give **two** uses of plant growth regulators in horticulture. **(2marks)**

f) Give **three** plant hormones **(3marks)**

23. By using a table, state the difference between animals and plants cells **(10marks)**

24. Enzyme pepsin is a protease that digests proteins in the stomach.

a) Define an enzyme (**2 marks)**

b) Suggest the optimum pH for this enzyme. **(2 marks)**

c) Name the liquid in the stomach with the optimum pH for this enzyme. **(2 marks)**

d) Suggest the optimum temperature for this enzyme. **(2 marks)**

e) Explain why the rate of an enzyme-catalyzed reaction slows down as temperature increases beyond optimum. **(2 marks)**

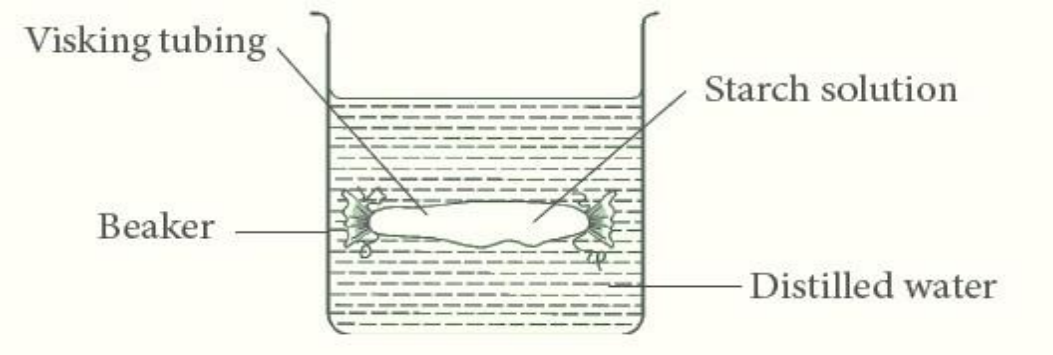
25. Study the equation given below.

$$6CO_2 + \_\_\_\_ \xrightarrow[\text{pigments}]{\text{energy}} C_6H_{12}O_6 + \_\_\_$$

(a) Complete the equation. **(2marks)**
(b) What is the source of energy for this reaction? **(2marks)**
(c) Name the pigment needed this reaction to occur. **(2marks)**
(d) What is the role of this pigment in photosynthesis? **(2marks)**
(e) State the mineral ion required for the synthesis of this pigment. **(2marks)**

Section C: This question is compulsory (15 marks)

26. Given the following diagram showing the biological investigation



a) Name and define the investigated process. **(3 marks)**
b) What observation would you make after one hour? **(1 mark)**
c) Account for your observation in (b) above **(2 marks)**
d) Give the importance of this process in animals and plants? **(2 marks)**
e) Explain what happen if you replace the visking tubing by an animal cell. **(2 marks)**
f) Explain how you can test starch into a solution. **(5 marks)**

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