**NAME: ……………………………………..……………………. DATE ………………**

**ADM NO: .……….. SIGNATURE ….………..…..………..**

**231**

**BIOLOGY**

**FORM TWO**

**TIME: 2 HOURS**

**OPENER EXAMINATION TERM 3, 2022**

***Kenya Certificate of Secondary Education***

**INSTRUCTIONS TO CANDIDATES: -**

* + *Write your name, Admission number and class in the spaces provided above.*
  + *Answer all the questions in the spaces provided*
  + *Candidates should answer the questions in English.*

1. (a) A student observed an insect wing under a hand lens and made a drawing whose length was 16cm with magnification of X4. Calculate the actual length of the wing in micrometers (3 mks)

1. a) Name the cell organelle found in abundance in the white blood cells. (1mk)

b) give a reason for your answer in (a) above (1mk)

1. An individual is of blood group B positive.
2. Name the antigens in the individual’s blood. (2mks)
3. Give the reason why the individual cannot receive blood form a blood group A donor. (2mks)
4. a) Name two digestive enzymes which are secreted in an inactive form. (2mks)
5. How is surface area increased in the small intestines (2mks)
6. State two functions of the body tube of the microscope. (2mks);
7. Name the blood vessel that supply the blood to: -

(i) Heart muscles (1 mark)

(ii) Kidney (1 mark)

1. Distinguish between the lymphocytes and phagocytes. (2mks)

|  |  |
| --- | --- |
| Lymphocytes | phagocytes |
|  |  |
|  |  |

1. The diagrams below shows two organelles Q and R



**Q R**

**a)** Identify the organelles Q and R (2 marks)

**b)** i) Explain why the organelle R would be abundant in a sperm cell. (1 mark)

ii) State the function of the structure marked A in the organelle R (1 mark)

9.a) Name the enzyme in erythrocytes that speeds up conversion of carbon (IV) oxide to carbonic acid. (1mk)

b) Name the disease that causes thickening and hardening of arteries (1mk)

10.Organisms are grouped into various kingdoms. Name three kingdoms where members (all

or some) are unicellular. (3mks)

11.The scientific names of three animals, leopard, wolf and lion are *Panthera pardus, Canis lupas* and *Panthera leo* respectively.

1. Why are scientific names given in latin? (1mk)
2. What does *Canis* refer to? (1mk)
3. Giving a reason, state the organisms that are most closely related. (2mks)

d)Define species (1mk)

12.a) Knowledge in a certain branch of biology is applied when dealing with locusts that infest a maize crop. Name the branch of biology. (1mk)

b) Explain the importance of the following in living organisms.

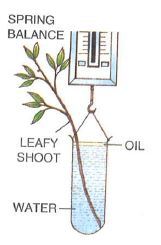
1. Nutrition. (1mk)
2. Excretion. (1mk)

13. Enumerate ways in which aerobic respiration differs from photosynthesis. (3mks)

14. Outline two ways in which Respiration is exploited in in industry and domestic field

by man. (2mks)

15.The following set up was placed in the sunshine for 1 hour to study a physiological process



1. What was the role of oil in the set up? (1mk)
2. Account for observation made after 1 hour (2mks)

16.A Class set up the experiment below to investigate some factors necessary for photosynthesis. Study the set up and answer the question that follow.

P

Q (Part of leaf trapped in rubber stopper)

R

Transparent conical flask

Sodium hydroxide

Before the apparatus were set up in the light, the potted plant was kept in a total darkness for 48 hours.

(i) What was the purpose of keeping in darkness? (1 mark)

(ii)State the colours obtained at the end of the experiment after the leaf was tested for starch. (3 marks)

*P*

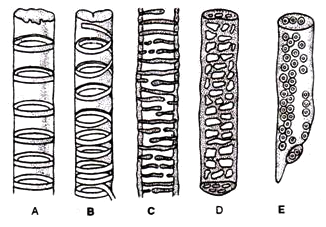
*Q*

*R*

17.Explain the effect of the factors listed below to the process of active transport.

1. Optimum temperature (2 marks)
2. High oxygen concentration (3mks)

18.The following are patterns of lignification of a tissue found in flowering plants



1. Identify the patterns labelled i) **A** (1mk

ii) **C** (1mk

1. Give a non-transport function of the tissues shown above? (1mk
2. Give **TWO** adaptations of the tissues above to their transport function (2mks

19. The following equation is a summary of a process in an animal muscle cell.

Glucose lactic acid + energy

1. (I) Name the process (1mk)

(ii) In which part of the cell does the above process (a) (i) take place? (1mk)

(iii) State two conditions under which the process in (a)(i) take place (3mks)

(b) Outline two processes in plants which require energy to take place (2mks)

20.a. State two adaptations of the frog's skin to gaseous exchange. (2 marks)

b. Explain how the human nasal cavity is adapted to gaseous exchange. (3 marks)

c. Explain why the amoeba does not require an elaborate gaseous exchange system. (2 marks)

d. Name the respiratory disease caused by Bordetella pertussis (1 mark)

21.An experiment was set up as shown below. Study the diagram and answer the questions that follow.



a) Name the physiological process being investigated. (1 mark)

1. b) Account for the observation at the end of the experiment (3 marks)
2. c) Account for the observation made if hot water was used at the start of the experiment.

(2 mark)

1. d) Name the property of the cell membrane that enables it detect changes in the environment
2. (1 mark)
3. e) How is the process named in a above important in predation (1mk)

22.a) Describe six factors affecting breathing rate in humans (12 marks)

b) Briefly describe the photosynthetic theory of stomatal opening. (8mks)