**`Name:……………………………………………..…......................Index No……....………… Signature……………….................. Date: ……………......**

**231/1 (THEORY)**

**BIOLOGY PAPER 1**

**TIME: 2 HOUR**

**PAVEMENT FORM 4 TRIAL 2 EXAMINATION 2021/2022**

**Kenya certificate of secondary education (K.C.S.E)**

* Write your **Name** and Index **Number** in the spaces provided above.
* Sign and write the date of examination in the spaces provided above.
* This paper consists of **TWO** sections: **A** and **B.**
* Answer **ALL** the questions in section **A** in the spaces provided after each question
* In Section **B**, answer question **6 (compulsory**) in the spaces provided and either question **7** or **8** in the spaces provided after question **8**.
* Answers must be written in English only.

***For Examiner’s Use Only:***

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| --- | --- | --- |
| **QUESTIONS** | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| **1- 31** | **80** |  |

*Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing*

1. State the branch of Biology that would be used in solving the problem of disputed parentage.

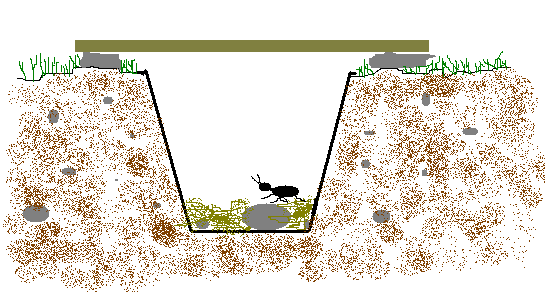
**(1mark)**

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1. A young scientist observed a bird laying her eggs in a nest and later the eggs hatched into chicks. Name two characteristics shown by the chicks that show a chick is a living thing but an egg is not. **(2marks)** ……………………………………………………………………………………….………………….

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1. Study the diagram below and answer questions that follow



(i) What is the name given to the apparatus shown above **(1 mark)**

………………………………………………………………………………………………………….

(ii) What is its use in Biological studies? **(2 marks)**

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1. a) A form two student observed the leaf shown below.



1. Name the process shown by the leaf. **(1mark)**

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1. Differentiate between the process shown above and transpiration  **(2marks)**

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1. A certain species of flowering plant relies entirely on sexual reproduction for propagation. The Chromosome number of the cell in the ovarian wall is 16.

a) The pollen tube nucleus. **(1mark)**

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b) A cell of the endosperm. **(1mark)**

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1. a) What are fossils?  **(1mark)**

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1. State **two** limitations of the use of fossils as an evidence of evolution. **(2marks)**

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1. Name the disease of the blood characterized by,
2. Abnormally large number of white blood cells **(1mark)**

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1. Crescent –shaped hemoglobin **(1mark)**

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1. a) State **two** roles of hydrochloric acid secreted by the stomach wall. **(2marks)**

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…….……………………………………………………………………………………………………

(b) Name the cells that secrete the above component. **(1mark)** …………………………………………………………………………………………………………………………………………………………………………………………………………………..

1. Name the organisms that cause each of the following diseases.

i) Amoebic dysentery. **(1mark)** …………………………………………………………………………………………………………...…………………………………………………………………………………………………………..

ii) Bilharzia **(1mark)**

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1. Explain how marine fish regulate their osmotic pressure. **(3marks**)

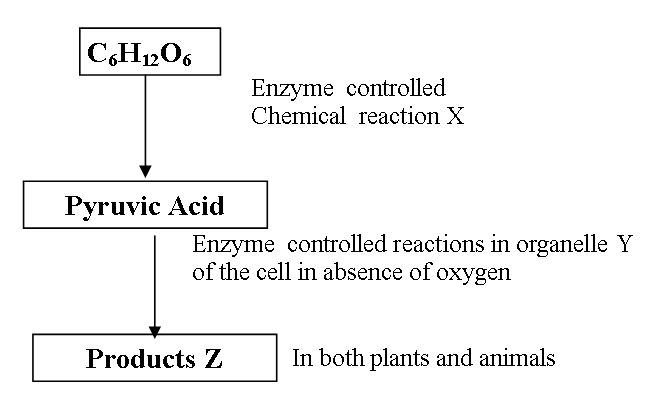
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1. A rhinoceros in a national park was found to be infected with ticks. State the trophic level occupied by the :

(i) Rhinoceros. **(1mark)** …………………………………………………………………………………………………………………………………………………………………………………………………………………..

(ii) Ticks **(1mark)** ……………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Study the flow chart below of a process that takes place in both plants and animals.



a) Name the above process. **(1mark)**

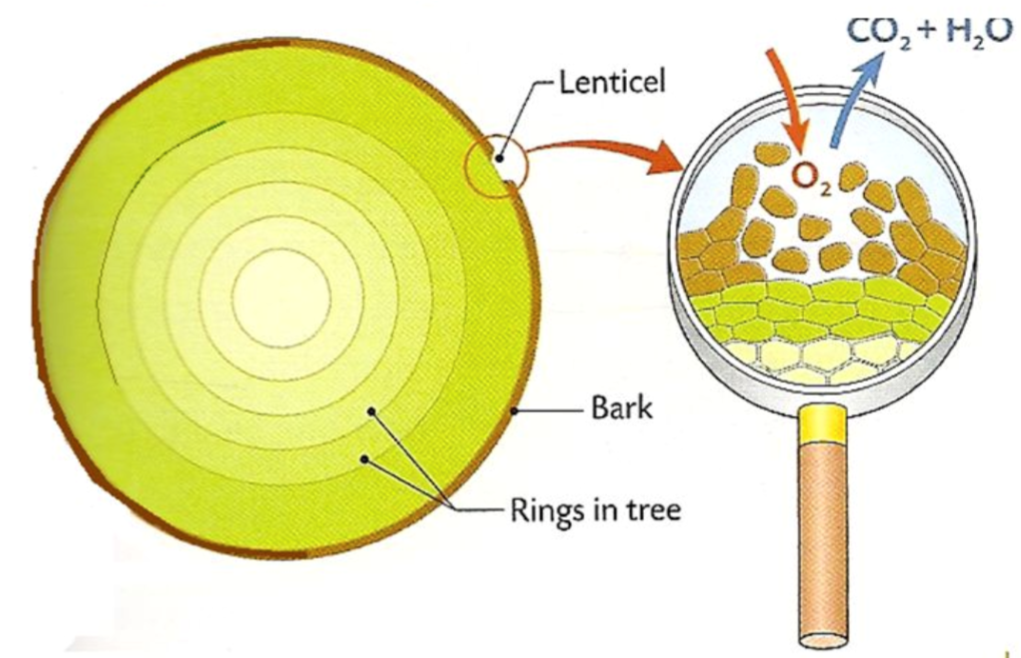
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b) In the above process name the chemical reaction represented by X. **(1mark)**

…………………………………………………………………………………………

1. The diagram below shows a gaseous exchange structure in the stems of angiosperms.

C



A

B

X

Name;

1. Part labelled A. **(1 mark)**

…………………………………………………………………………………………………

1. Apparatus X.  **(1 mark)**

…………………………………………………………………………………………………

1. Substances represented by arrows B and C. **(2 marks)**

B……………………………..…………………………………………………….………………... C…………………………………….…………………………………….……… ………………….

1. When blood is flowing through a vena cava, which main blood vessel will it flow through next?

**(1mark)**

……………………………………………………………………………………………………

1. Below is an image of a biological vector. Use it to answer questions that follow.



(a) Identify the parasite transmitted into human blood by the organism. **(1 mark)**

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(b) Name the blood cells that are destroyed by the parasite in (a) above. **(1 mark)**

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(c) State one biological method used to eradicate the larvae of these organisms. **(1 mark)**

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1. Give the structural adaptations of the following in an insect pollinated plant.

(a) Pollen grain. **(1 mark)**

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(b) Stigma. **(2 mark)**

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1. Use the illustration below to answer questions that follow.



(a) Identify the type of pollution that has such an effect. **(1 mark)**

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(b) State two effects of the type of pollution identified in (a) above to the organism. **(2 marks)**

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1. Identify the following types of responses:

(a) Pollen tube growing towards the ovary **(1 mark)**

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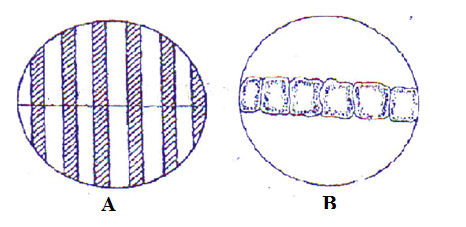
(b) Maggots moving away from light. **(1 mark)**

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1. State two activities of the cell that are controlled by the nucleus. **(2 marks)**

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1. The field of view of a light microscope appeared as shown below in diagram A and the diameter in A was occupied by cells as shown in B.



Calculate the length of one cell. **(3 marks)**

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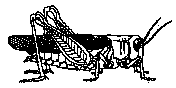
1. State two importance of water in germination of seeds. **(2 marks)**

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1. Why is sexual reproduction advantageous in flowering in plants? **(2 marks)**

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1. Below is an illustration of an organism captured by students during a practical lesson.



(a) Identify **three** features that enable the organism to be placed in the phylum Arthropoda. **(3marks)** ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(b) Explain why the organism will die when Vaseline is applied on its thorax. **(1 mark)**

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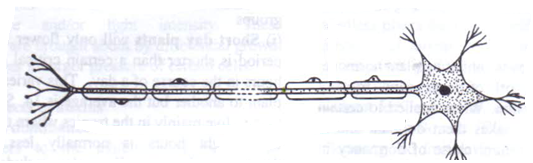
1. State the significance of natural selection. **(2 marks**)

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1. Explain why a plant shoot develops lateral branches when its tip is removed. **(2 marks)**

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1. The diagram below shows the structure of a neurone.



(a) Identify the neurone and state its function **(2 marks)**

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…………………………………………………………………………………………………………

(b) Name the part of the brain that is involved in learning and memory. **(1 mark)**

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1. Explain what happens to the structures of the human eye when a student reading a white printed paper on a bright sunny day enters a dark room for examinations. (3 marks)

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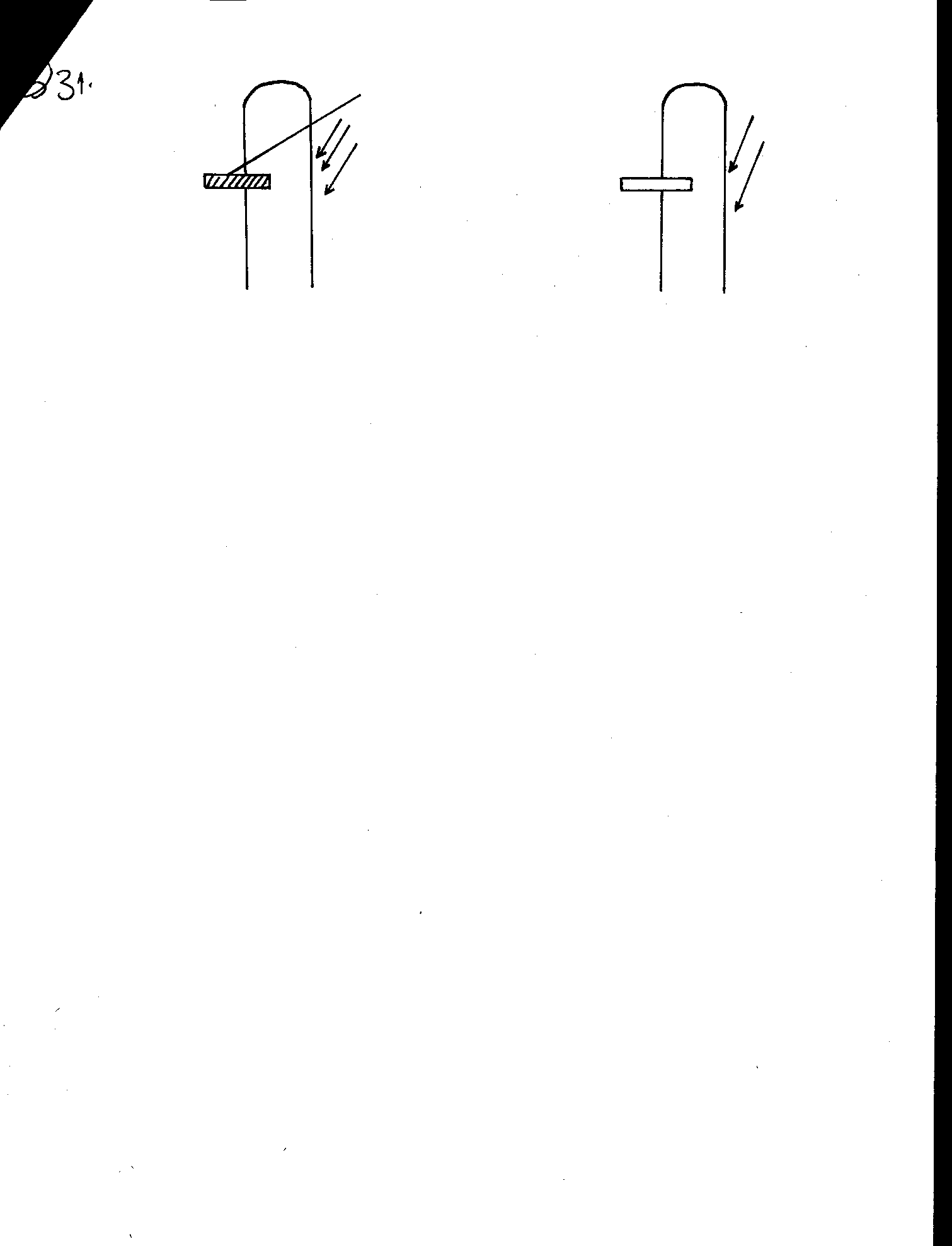
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1. The experiment below was carried out by form four students. The result was recorded below:

Sheet of mica placed halfway horizontally



5 days later

Source of light

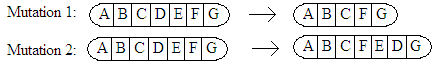
Explain why the shoot doesn’t bend towards the light. **(3marks)**

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1. In an investigation, a group of students came across animals living in the following habitats. What was the likely main nitrogenous waste product of each in its habitat? **(3marks)**

|  |  |
| --- | --- |
| **Habitat** | **Nitrogenous waste** |
| Terrestrial |  |
| Fresh water |  |
| Marine |  |

1. **State** the functions of each of the following parts of male reproductive system. **(3marks)**
   1. Sertoli cells ……………………………………………………………………………...................
   2. Epidydimis……………………………………………………………………………………………
   3. Seminiferous tubules ………………………………………………………………………………..
2. The diagram below shows various types of gene mutations..



* 1. **Identify** the type of gene mutation shown above. **(2marks)**

Mutation 1 …………………………………………………………………………………………….

Mutation 2 …………………………………………………………………………………………….

* 1. **Distinguish** between gene and chromosomal mutations **(2mark)**

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