**Name** .................................................................................**Index Number**...........................................................

**Candidate’s Signature** .....................................................**Date**…...................................................................................

**231/1**

**BIOLOGY Paper 1**

**2017**

2 hours

EXAM CODE: 1001/2017

**BRILLIANT KENYA CERTIFICATE OF SECONDARY EDUCATION PREPARATORY EXAMINATION 2017**

**Kenya Certificate of Secondary Education**

BIOLOGY

**Paper 1**

2 hours

**INSTRUCTIONS TO CANDIDATES**

## Write your name and index number in the spaces provided above.

1. *Sign and write the date of the examination in the spaces provided above.*
2. *Answer* ***all*** *the questions in this question paper.*
3. *Answers must be written in the spaces provided in this booklet.*
4. *Additional pages must not be inserted****.***
5. *This paper consists of 11 printed pages.*
6. *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*
7. *Candidates should answer the questions in English.*

# FOR EXAMINER’S USE ONLY

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Maximum Score** | **Candidate’s Score** |
| 1 – 28 | 80 |  |

*Answer* ***all*** *the questions.*

1. The diagram below illustrates a cell.

K

J

L

* 1. State the functions of the parts labelled **J** and **L**. (2 marks)

**J** .........................................................................................................................................................................

**L** ........................................................................................................................................................................

* 1. Describe the structure of the part marked **K**. (1 mark)

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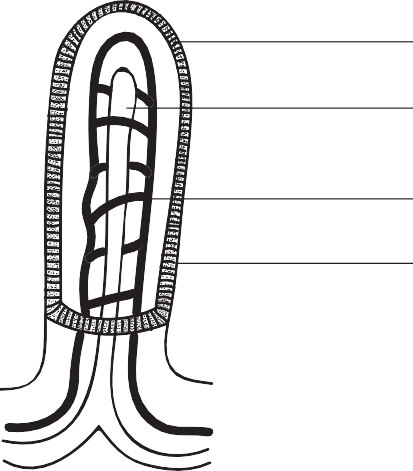
1. State the functions of the following parts of a root:
   1. Piliferous layer (1 mark)

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* 1. Endodermis (1 mark)

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1. The diagram below shows a structure found in the mammalian digestive system.

K L

M N

* 1. What is the name of the structure? (1 mark)

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* 1. State the role of the part marked **L**. (2 marks)

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* 1. Name the parts marked **K** and **N**. (2 marks)

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1. State the uses of the following plant excretory wastes:
   1. Gum Arabica (1 mark)

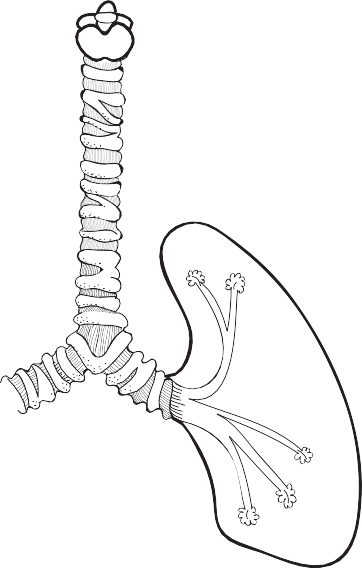
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* 1. Tannins (1 mark)

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1. The diagram below shows part of the human breathing system.

A B



C

* 1. Name the parts labelled **A** and **C**. (2 marks)

**A** .........................................................................................................................................................................

**C** .........................................................................................................................................................................

* 1. State one function of the part marked **B**. (1 mark)

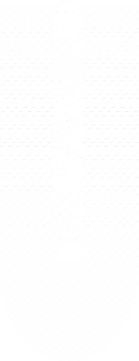
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1. A visking tubing is selectively permeable. In the experiment shown below to demonstrate osmosis, the following results were obtained.

Visking tubing

Solution S

Solution R



Initial mass of visking tubing + contents = 10.0 g

Mass of visking tubing + contents after experiment =11.8 g

Account for the results of the experiment. (3 marks)

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1. In mice, the coat colour is determined by the dominant allele for brown colour B and recessive allele for white colour b. What proportion of the offspring produced from a cross between two mice of heterozygous colour would have brown coats? (1 mark)

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1. Distinguish between convergent evolution and divergent evolution. (2 marks)

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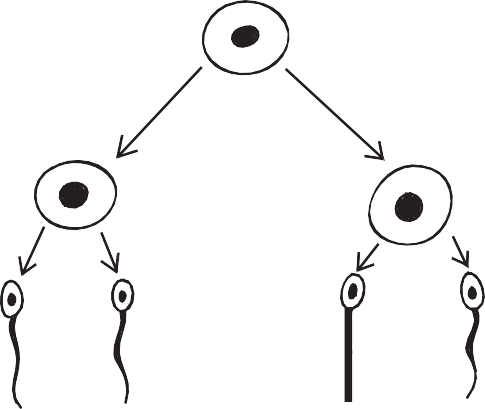
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1. (a) What is double fertilization? (1 mark)

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(b) The diagram below shows the chromosome complement of cells during the development of abnormal sperms.

44 + XY

23 + X 21 + Y

23 + X

23 + X

21 + Y

21 + Y

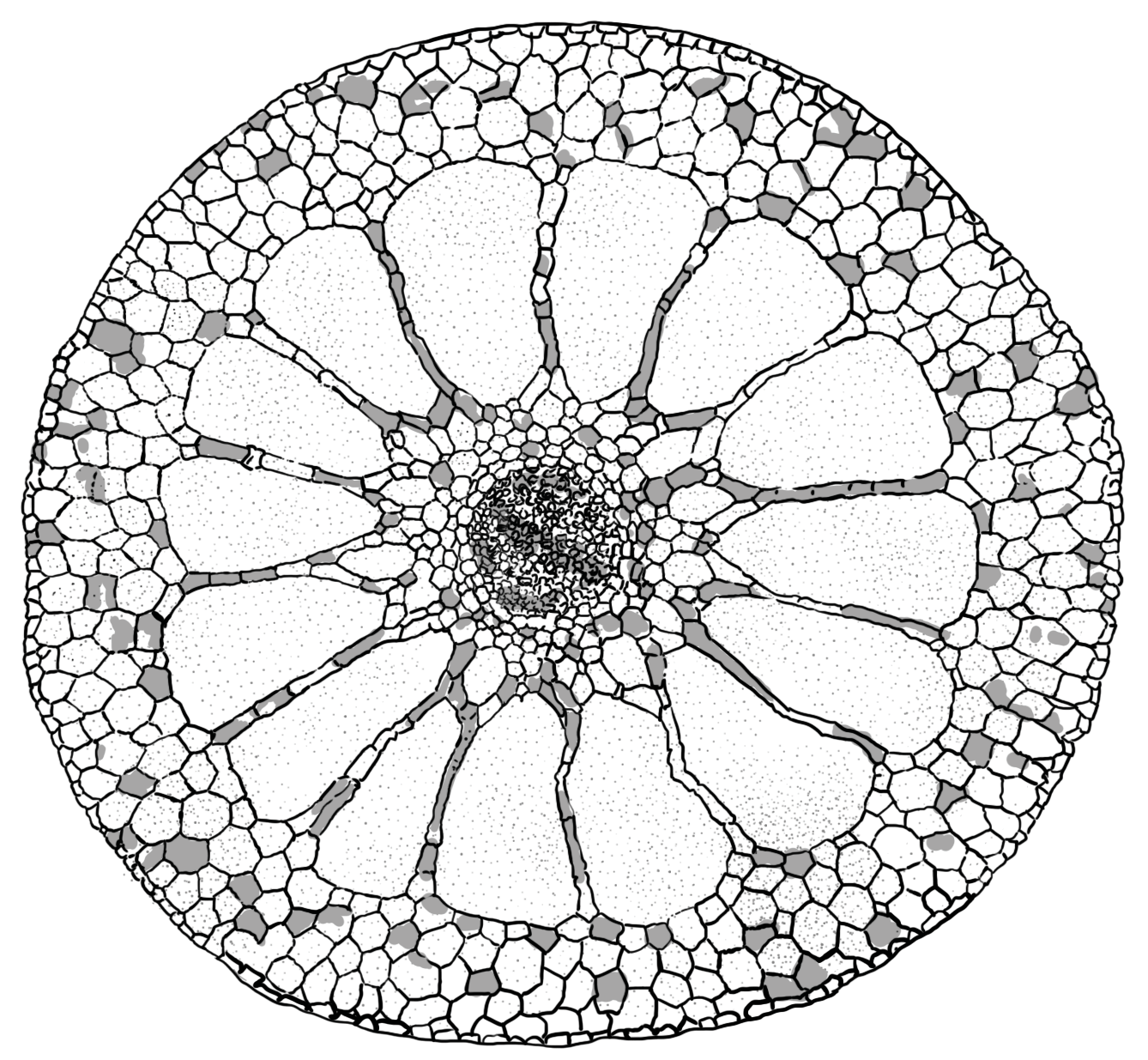
A sperm with chromosome complement 23 + X fertilizes a normal haploid egg. What is the chromosome number and sex of the resulting zygote? (1 mark)

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1. The illustration below shows the cross section of a stem of a hydrophyte.

S



T

V

U

* 1. Name the parts marked **S** and **U**. (2 marks)

**S** .........................................................................................................................................................................

**U** .........................................................................................................................................................................

* 1. State **one** function of the part labelled **U**. (1 mark)

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1. The diagram below shows part of a nephron from the human kidney.

R

P

* 1. (i) Name the structure labelled **R**. (1 mark)

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(ii) Name the process carried out at **P**. (1 mark)

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* 1. The hormone ADH affects water reabsorption from the nephron.
     1. Which part of the brain releases ADH? (1 mark)

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* + 1. Name a part of the nephron where water is reabsorbed. (1 mark)

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1. The illustration below represents part of a cell organelle.

T

N

* 1. Name the organelle. (1 mark)

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* 1. Name the structure labelled **N**. (1 mark)

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* 1. Which stage of photosynthesis takes place in the part labelled **T**? (1 mark)

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1. Herbivores have bacteria in their rumen and caecum that digest cellulose.
   1. What type of relationship is shown by the two organisms? (1 mark)

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* 1. State how each organism benefits from the relationship.
     1. Bacteria (1 mark)

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* + 1. Herbivore (1 mark)

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1. How is the skin of a frog adapted to gaseous exchange? (2 marks)

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1. Name **three** classes of animals that excrete their nitrogenous waste in the form of uric acid.

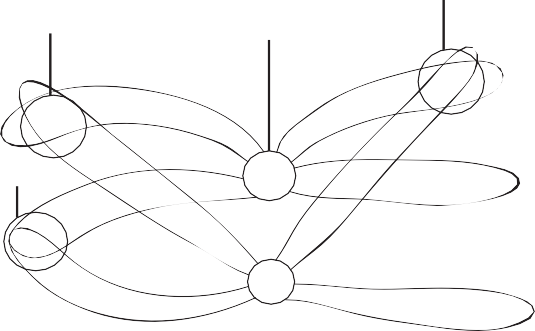
(3 marks)

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1. A student observed the chromosomes shown below under a microscope.

A

A B

A

* 1. What process is taking place at point **A**? (1 mark)

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* 1. Name the parts labelled **A** and **B**. (2 marks)

**A** .........................................................................................................................................................................

**B** ..........................................................................................................................................................................

1. List **three** advantages of asexual reproduction. (3 marks)

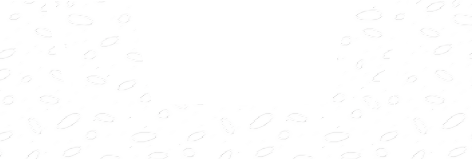
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1. Use the diagram below to answer the questions that follow.

Plant



Porous pot

Water

* 1. What type of response is demonstrated in the diagram? (1 mark)

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* 1. What is the significance of the type of response shown above? (1 mark)

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1. Name a sex-linked human disorder located on the:
   1. X-chromosome. (1 mark)

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* 1. Y-chromosome. (1 mark)

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1. Name the tissues in plants responsible for:
   1. transport of water and mineral salts. (1 mark)

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* 1. transport of carbohydrates. (1 mark)

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* 1. primary growth. (1 mark)

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1. Give three factors that determine the amount of energy a human being requires in a day.

(3 marks)

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1. Account for the following phases of a sigmoid curve representing the growth of an organism.
   1. Lag phase (2 marks)

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* 1. Plateau phase (2 marks)

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1. (a) What is a single circulatory system? (1 mark)

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1. Name an organism which has a single circulatory system. (1 mark)

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1. Name the opening to the chamber of the heart of an insect. (1 mark)

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1. Giving a reason in each case, name the class to which each of the following organisms belongs.

(4 marks)

Bean plant

…………........……………………….............…………........………………………………......………………............. Reason

…………........……………………….............………………........…………………………......………………............. Bat

…………........……………………….............………………………........…………………......………………............. Reason

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

1. The diagram below represents a nerve cell. Use it to answer the questions that follow.



* 1. What type of nerve cell is shown in the diagram above? (1 mark)

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* 1. Give a reason for your answer in (a) above. (1 mark)

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* 1. Name the nerve cell located in the grey matter of the spinal cord. (1 mark)

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1. State the significance of the following parts of a sperm cell.
   1. Acrosome (1 mark)

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* 1. Mitochondria (1 mark)

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* 1. Tail (1 mark)

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1. State one function of each of the following hormones:
   1. Insulin (1 mark)

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* 1. Glucagon (1 mark)

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1. A woman of blood group O has four children. All the children are of blood group A.
   1. What is the blood group of the father of the children? (1 mark)

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* 1. Use a genetic cross to show your working. (3 marks)