

Name

Index Number

School

Candidate's Signature

231/1

Date

BIOLOGY

Paper 1

2015

2 hours

MAKUENI COUNTY KCSE 2015 PREPARATORY EXAMINATION

Kenya Certificate of Secondary Education

BIOLOGY

Paper 1

2 hours

Instructions to candidates

- (a) Write your name and index number in the spaces provided above.
- (b) Sign and write the date of the examination in the spaces provided above.
- (c) Answer **all** the questions in this question paper.
- (d) Answers must be written in the spaces provided in this booklet.
- (e) Additional pages must not be inserted.
- (f) **This paper consists of 11 printed pages.**
- (g) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
- (h) **Candidates should answer the questions in English.**

For Examiner's Use Only

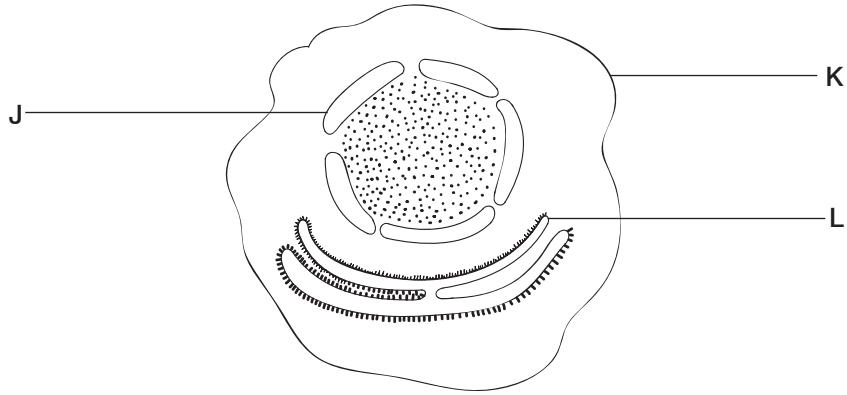
Question Number	Maximum Score	Candidate's Score
1 – 28	80	

Sponsored by H.E. Prof. Kivutha Kibwana, Governor, Makueni County.

TURN OVER

Answer *all* the questions.

1. The diagram below illustrates a cell.



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

J

L

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

.....

2. State the functions of the following parts of a root:

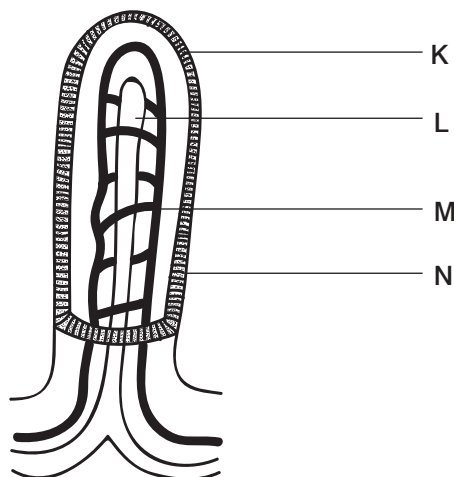
(a) Piliferous layer (1 mark)

.....

(b) Endodermis (1 mark)

.....

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



(a) What is the name of the structure? (1 mark)

.....

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

.....

.....

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

.....

.....

4. State the uses of the following plant excretory wastes:

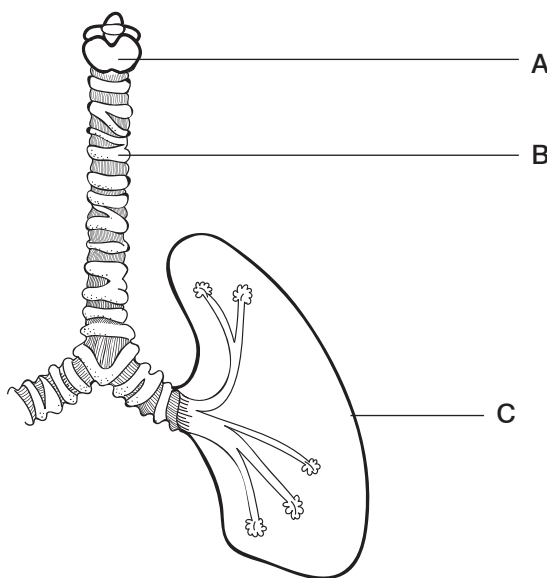
(a) Gum Arabica (1 mark)

.....

(b) Tannins (1 mark)

.....

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



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

A

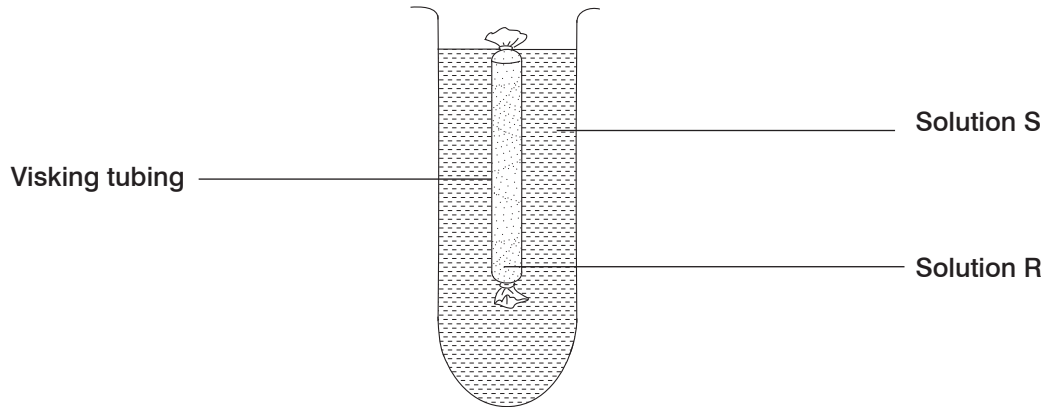
C

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

(1 mark)

.....

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



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)

.....
.....
.....

7. 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)

.....

8. Distinguish between convergent evolution and divergent evolution.

(2 marks)

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.....
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.....

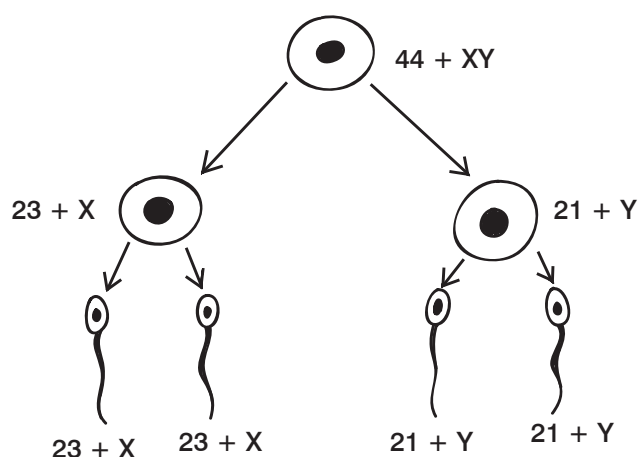
9. (a) What is double fertilization?

(1 mark)

.....

.....

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

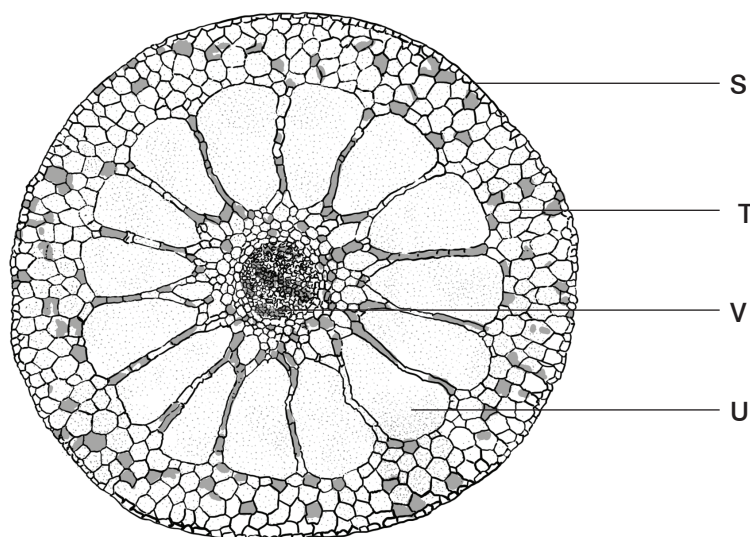


A sperm with chromosome complement $23 + X$ fertilizes a normal haploid egg. What is the chromosome number and sex of the resulting zygote? (1 mark)

.....

.....

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



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

S

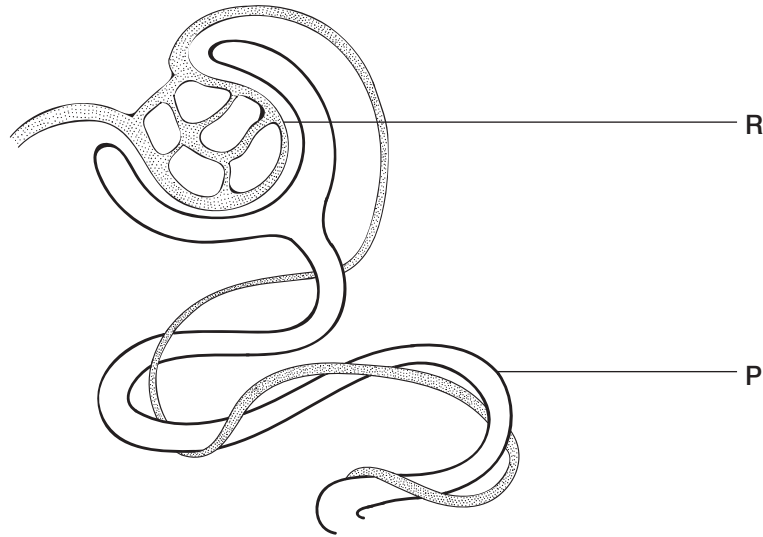
U

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

.....

.....

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



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

.....

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

.....

(b) The hormone ADH affects water reabsorption from the nephron.

(i) Which part of the brain releases ADH? (1 mark)

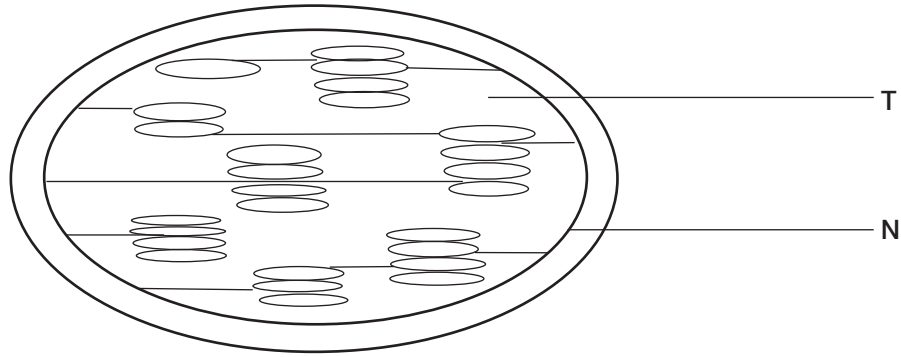
.....

.....

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

.....
.....

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



(a) Name the organelle. (1 mark)

.....

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

.....

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

.....

13. Herbivores have bacteria in their rumen and caecum that digest cellulose.

(a) What type of relationship is shown by the two organisms? (1 mark)

.....

(b) State how each organism benefits from the relationship.

(i) Bacteria (1 mark)

.....

(ii) Herbivore (1 mark)

.....

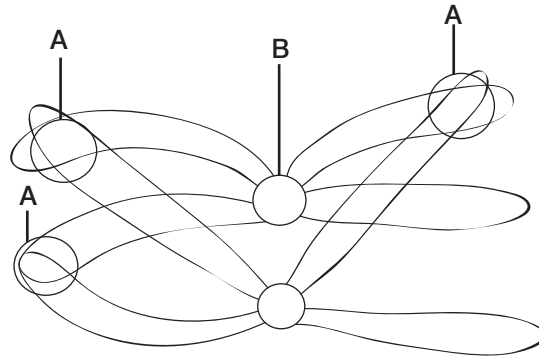
14. How is the skin of a frog adapted to gaseous exchange? (2 marks)

.....
.....

15. Name **three** classes of animals that excrete their nitrogenous waste in the form of uric acid. (3 marks)

.....
.....
.....

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



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

.....

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

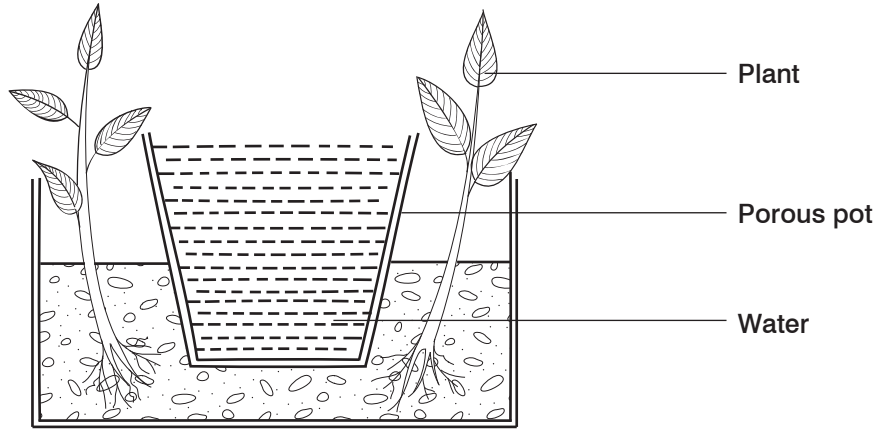
A

B

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

.....
.....
.....

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



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

.....

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

.....

19. Name a sex-linked human disorder located on the:

(a) X-chromosome. (1 mark)

.....

(b) Y-chromosome. (1 mark)

.....

20. Name the tissues in plants responsible for:

(a) transport of water and mineral salts. (1 mark)

.....

(b) transport of carbohydrates. (1 mark)

.....

(c) primary growth. (1 mark)

.....

21. Give three factors that determine the amount of energy a human being requires in a day. (3 marks)

.....
.....
.....

22. Account for the following phases of a sigmoid curve representing the growth of an organism.

(a) Lag phase (2 marks)

.....
.....

(b) Plateau phase (2 marks)

.....
.....

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

.....

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

.....

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

.....

24. Giving a reason in each case, name the class to which each of the following organisms belongs. (4 marks)

Bean plant

.....

Reason

.....

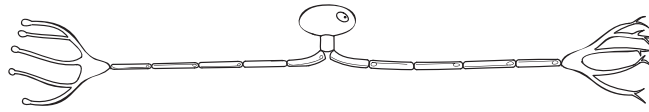
Bat

.....

Reason

.....

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



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

.....

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

.....

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

.....

26. State the significance of the following parts of a sperm cell.

(a) Acrosome (1 mark)

.....

(b) Mitochondria (1 mark)

.....

(c) Tail (1 mark)

.....

27. State one function of each of the following hormones:

(a) Insulin (1 mark)

.....

(b) Glucagon (1 mark)

.....

28. A woman of blood group O has four children. All the children are of blood group A.

(a) What is the blood group of the father of the children? (1 mark)

.....

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