NAME…….. INDEX NO…….....

231/1
BIOLOGY
PAPER 1
(THEORY)
JULY/AUGUST, 2016
TIME: 2 HOURS

CANDIDATE'S SIGN……..……

DATE…….……..

KIRINYAGA CENTRAL SUB-COUNTY EFFECTIVE FORTY JOINT EXAMINATION – 2016

Kenya Certificate of Secondary Education
BIOLOGY
PAPER 1
(THEORY)
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Write your **name** and **index number** in the spaces provided above.
2. **Sign** and write the **date** of examination in the spaces provided above.
3. Answer **all** the questions in the spaces provided.
4. Answers must be written in the spaces provided in the question paper.
5. Additional pages **must not** be inserted.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1 - 23	80	

1. (a) Define the term growth. (1 mark)

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(b) Name the tissue in plants responsible for:

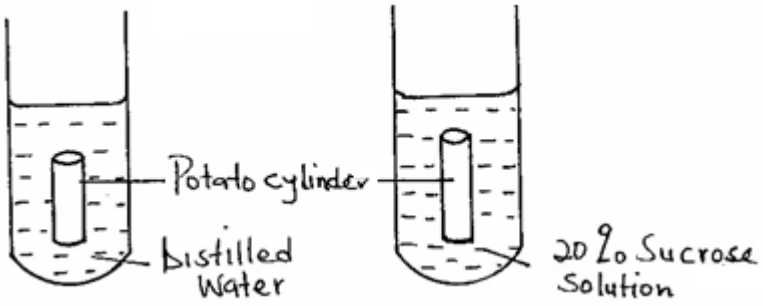
(i) Primary growth. (1 mark)

……

(ii) Secondary growth. (1 mark)

……

2. Two potato cylinders were carefully dried on a blotting paper and weighed. Each piece weighed 2 grams. One was placed in each test tube as shown in the diagram below.



(a) After 48hrs, which potato cylinder will be heavier. Explain. (2 marks)

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(b) Name the substance whose movement was responsible for the weight changes in the potato cylinder you identified in (a) above. (1 mark)

……

(c) Name the process which was responsible for the movement of the substance you identified in (b) above. (1 mark)

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3. Why are the following steps taken when preparing across section of a leaf for viewing under the microscope?

(a) Cutting thin section. (2 marks)

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(b) Placing the section in water. (2 marks)

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4. Below is the dental formula of a mammal.

$i\frac{0}{4}, c\frac{0}{0}, pm\frac{3}{3}, m\frac{2}{3}$

(a) What is the total number of teeth? (1 mark)

……

(b) (i) What is mode of feeding in the mammal? (1 mark)

……

(ii) Give **one** reason for your answer above. (1 mark)

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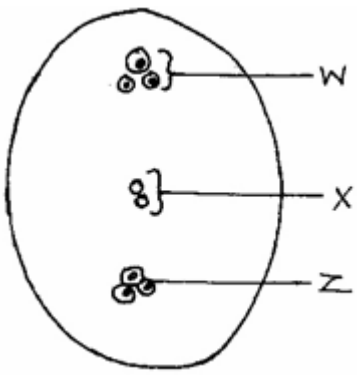
5. Below is a diagram of a mature embryo sac.



(a) Name the parts labelled.

(i) **W** …….. (1 mark)

(ii) **Z** …… (1 mark)

(b) Give the name of the part of the seed formed when the part labelled **X** fuses with one of the male nucleus. (1 mark)

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6. The table below shows approximate numbers of organisms found in an ecosystem.

Type of organism	**Numbers**
Grasshoppers	Many
Hawks	3 – 4
Snakes	15 – 30
Green plants	Very many
Lizards	80 – 120

(a) Using the information in the table draw a pyramid of numbers. (3 marks)

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(b) Explain what would happen to the other organisms if all the lizards suddenly died off. (2 marks)

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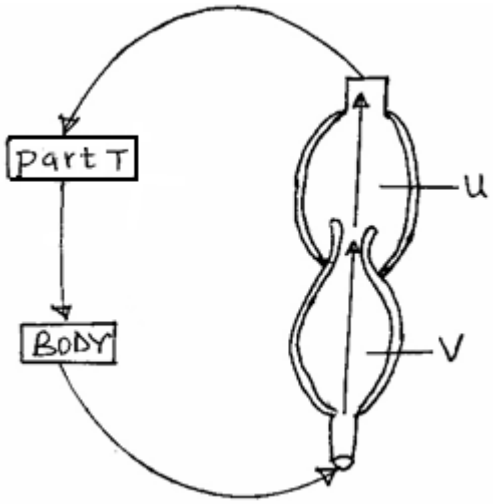
7. The diagram below show single circulation a fish.



(a) Write down the names of the parts labelled **U** and **V**. (2 marks)

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……

(b) Explain the main disadvantage of this type of circulation. (1 mark)

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8. Mr. Juma has sued Serenity Hospital on grounds that their child was wrongly identified such that they got the wrong one. The child is blood group O. Mr. Juma is blood group AB while Mrs. Juma is heterozygous blood group A.

(a) Work out the possible blood group of their offsprings. (4 marks)

(b) Is Mr. Juma justified in his claims? (1 mark)

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9. (a) Name the bacteria found in the root nodules of leguminous plant. (1 mark)

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(b) What is the role of the bacteria named in (a) above? (1 mark)

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10. (a) Which substance in the cigarettes smoke may cause lung cancer. (1 mark)

……

(b) The table below shows differences in air breathed in and out.

Gas	Volume of air breathed in	Volume of air breathed out
Oxygen	21.00	16.00
Carbon (IV) oxide	0.04	4.00

What is the reason for there differences. (2 marks)

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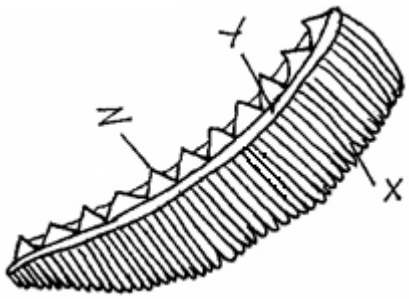
11. The diagram below represents an organ of gaseous exchange.



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

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(b) Name the class to which the animals that have the organ you identified in (a) above belongs. (1 mark)

……

(c) State **one** way in which structure **X** is adapted for gaseous exchange. (2 marks)

……

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12. In a prolonged drought period, forage was scarce. It made animals reach out for higher forage and this way the giraffes got the stretched long necks.

(a) What is the term used for a characteristic such as the long necks outlined? (1 mark)

……

(b) What is the name given to the theory that describes the evolution of such structures like the long necks? (1 mark)

……

(c) State and explain the limitation of the theory you named in (b) above. (2 marks)

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13. (a) A goat weighing 20kg requires 216KJ while a mouse weighing 54gms requires 2830KJ per day. Explain. (2 marks)

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(b) What is the end products of respiration in plants when there is insufficient oxygen supply? (1 mark)

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14. State the functions of the following male hormones.

(a) Follicle stimulating hormone. (1 mark)

……

(b) Luteinizing hormone. (1 mark)

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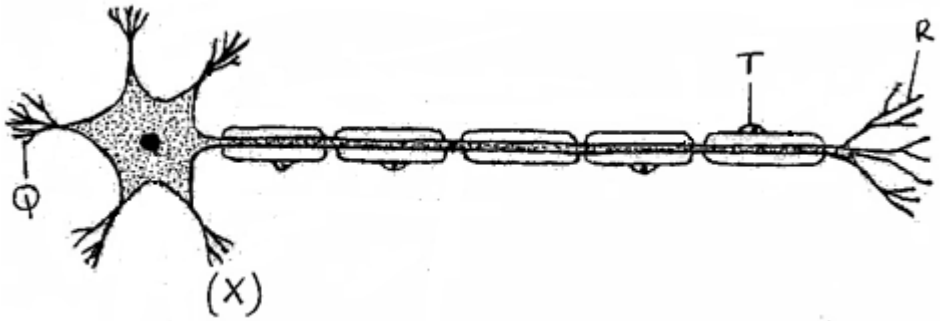
15. The diagram below represents the structure of a nerve cell.



(a) Identify the nerve cell. (1 mark)

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

……

……

(c) State the function of the part labelled **T**. (1 mark)

……

(d) Using an arrow show the direction of an impulse on the diagram. (1 mark)

16. A food substance called tripalmitin C_{15} H_{98} O_6 was oxidized fully and the following equation worked out.

$2C_{51}$ H_{98} O_6 + $145O_2$ → $102CO_2$ + $98H_2O$

(a) Calculate the RQ of tripalmitin. (2 marks)

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(b) From the RQ value obtained above, to what group of food substances does tripalmitin belong. (1 mark)

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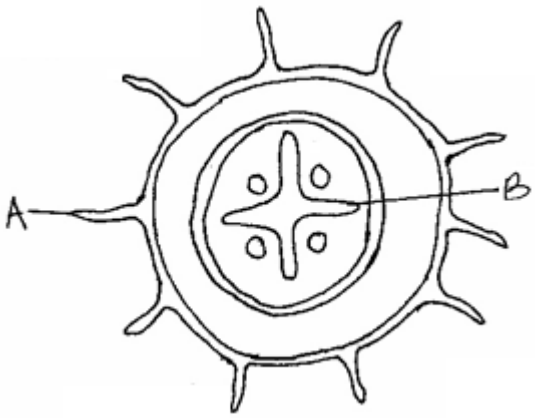
17. The diagram below represents a cross section obtained from a plant. Use it to answer the questions that follow.



(a) From which part of the plant was the section obtained from: (1 mark)

……

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

……

(c) Name part **B**. (1 mark)

……

(d) Name the material that strengthens the part you named in (c) above. (1 mark)

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18. (a) Given a sample of urine, name one test you would carry out to determine if it was obtained from a person suffering from diabetes mellitus. (1 mark)

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(b) What results are expected if one is diabetic? (2 marks)

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(c) Explain why sugar appears in the urine of a diabetic. (2 marks)

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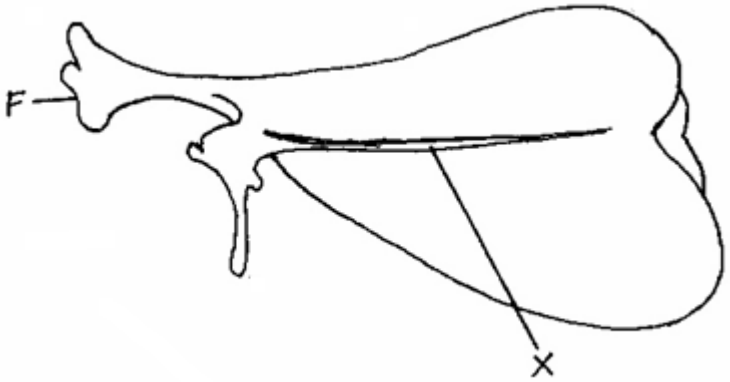
19. The diagram below represents a bone of a mammal.



(a) Identify the bone. (1 mark)

……

(b) Name the part marked **X**. (1 mark)

……

(c) Name the bone that articulates at the part labelled **F**. (1 mark)

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(d) Explain one way in which the bone is adapted to its function. (1 mark)

……

20. (i) Name the class in the phylum arthropoda with the largest number of individuals.

…….. (1 mark)

(ii) State **three** adaptations that makes this class very successful. (3 marks)

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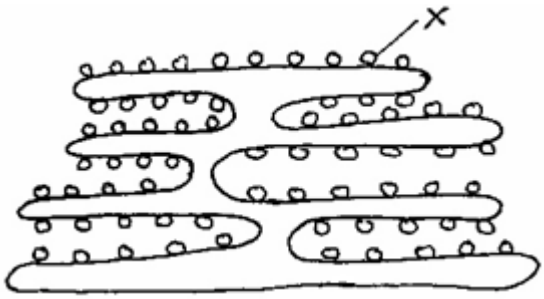
21. The diagram below represents a cell organelle.



(i) Name the organelle above. (1 mark)

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(ii) State it's function. (1 mark)

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(iii) Identify the structures labelled **X** and state it's functions. (2 marks)

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22. (a) In which organ is cardiac muscle found. (1 mark)

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(b) What is the function of the cardiac muscle in the organ you have named in (a) above. (1 mark)

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23. How does carboxyhaemoglobin lead to death? (2 marks)

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