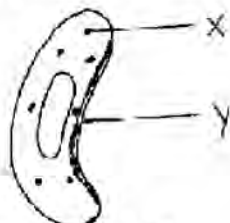**MURANG'A SOUTH MULTILATERAL EXAMINATION 2016**
Kenya Certificate of Secondary Education (K.C.S.E)
231/1
BIOLOGY
PAPER1 (THEORY)
JULY / AUGUST 2016
TIME: 2 HOURS

SECTION A (40 marks)
Answer all questions in the spaces provided

1. The diagram below represents a guard cell
    a) Name the parts labeled X and Y. (2mks)

    b) State the role of the cell (1mk)

2. a) Koimbi school biology student observed a field of view of 2mm radius when using the medium power objective lens of a microscope to observe onion epidermal cells. Calculate the area of the field of view in micrometers. *(1mm =1000mm)* (2mks)
    b) What is the average size of the cell in micrometers (2mks)

3. a) Name the site of gaseous exchange in mammals. (1mk)
    b) State one characteristics of the site named in (a) above. (1mk)

4. Outline two roles of active transport in human beings. (2marks)

5. Two equal strips A and B were from a potato whose cell was 30% of sugar. The strip A was placed in a solution of 10% sugar concentration while strip B was placed in 50% sugar Concentration
    a) What change was expected in strips A and B? (2mks)
    b) Account for the change in strip A. (2mks)

6. The leaf of a potted green plant which had been kept in dark for 24 hours was smeared with petroleum jelly on its lower surface and then exposed to sunlight for 6 hours. Starch test on the leaf was negative. Account for the observation. (2 marks)

7. What is the role of vascular bundles in plant nutrition? (2mks)

8. The table below shows the energy use per day in kilojoules

Age(years)	Male	Female
2	5,500	5,500
5	7,000	7,000
8	8,800	8,000
11	10,000	9,200
14	12,500	10,500
18	14,200	9,600
25	12,100	8,800

    a). From the table, explain why after age 8 males require more energy than females. (1mrk)
    b). Other than sex and age, name *one* other factor that determine energy requirements in human beings (1mk)

9. (a) Name the excretory product produced in the liver and used in the intestine. (1mk)
    (b) State two functions of the waste product named in (a) above. (2mks)

10. State three features that a grasshopper, a crab, a spider and a millipede have in common. (3 mark)

10 a) Name the hormone that stimulate the maturation of the graafian follicle store release a mature ovum in female reproductive cycle. (1mark)
    b) Explain why menstruation does not take place after fertilization in human beings. (2marks)

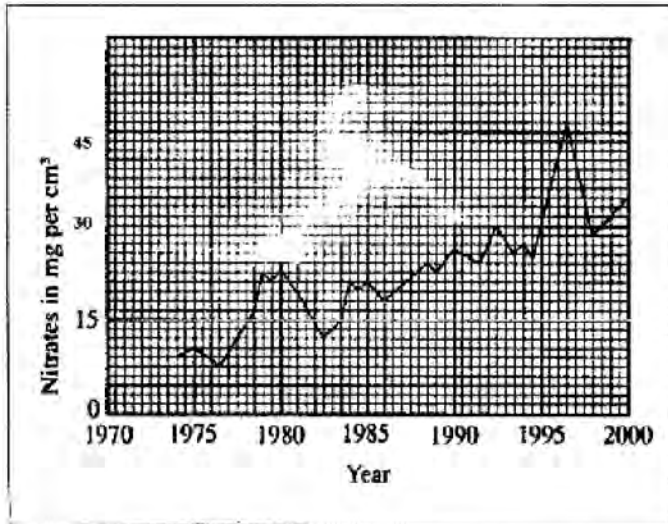11. (a) Define the following terms. (2marks)
    i. Population
    ii. Community
(b) Name a method that could be used to estimate the population size of the following organisms.
    i. Fish in a pond. (1mark)
   ii. Black jack in a garden. (1mark)

[Type here]

12. Use the graph below to answer the question that follow.

a) Calculate the difference in nitrate concentration between the highest and lowest. (1mk)
b) How can increase in nitrate concentration in the river lead to death of fish? (2mks)

13. The diagram below represents a stage during cell division.
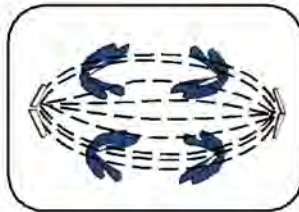
a) Name the stage of cell division (1 mark)
b) Give two reasons for your answer in a) above. (2 marks)
c) State the significance of this stage of cell division in living organisms. (1 mark

14. State three roles of placenta during pregnancy. (3mks)

15. The diagram below shows the human ear.
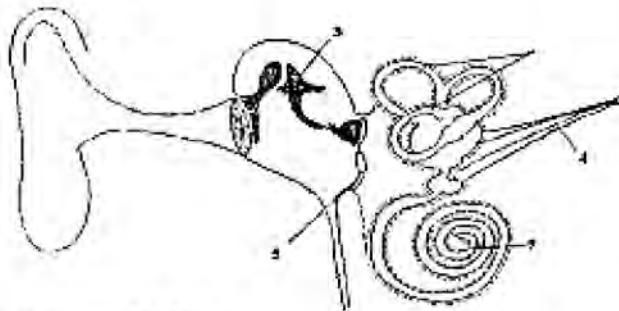
a). Name the structures labeled 3, 4 (2mks)
b) . *State* the function of the parts labeled 5 and 7. (2mrks)

16. The diagram below show various types of gene mutations.
Mutation I;

| K | L | M | N | O | P | Q | ⟶ | K | L | M | P | Q |

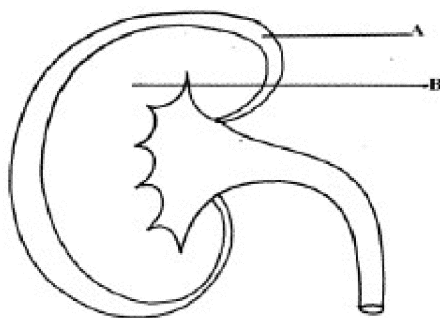| S | T | U | N | W | X | Y | ⟶ | S | T | U | V | W | X | Y | Mutation II;

i) Identify the type of mutations shown above (2 marks)
ii) Name two examples of a disorder that results from gene mutation II. (1 mark

17. Name *one* disorder caused by a dominant gene in human. (2mks)

18. The figure below shows a vertical section through a mammalian kidney.

    (a) Label the parts A and B   (2mks)
    (b) Which part is the Bowman"s capsule found?   (1mk)
19. Name two components of blood that are not present in glomerular filtrate.   (2mks)

20. The oxidation state of a certain food is represented below by a chemical equation:-
    $2 C_3H_2O_2N + 6O_2 \quad \rightarrow \quad (NH)_2CO_2 + 5CO_2 + 5H_2O$
    a) Calculate the respiratory quotients (RQ) of the food substrate   (2 marks)
    b) Identify the food substrate   (1 marks)
21. (a) State the part of the eye involved in :   (3mks)
    (i) Colour vision.
    (ii) Maintaining the shape of the eyeball.
    (iii) Change in diameter of the lens.
    (b) A person was not able to see far objects clearly but could view near objects clearly. Name the eye defect the person had
                                                           (1mk)
    (c) How could the defect in (b) above be corrected?   (1mk)
22. (a)State the phylum where all members have open circulatory system.   (1mk)
    b) Explain the advantages of closed circulatory system over open circulatory system.   (2 marks)
23. a) (i) What is meant by vestigial structures?   (1mk)
       (ii) Give an example of a vestigial structure in human   (1mk)
    b) Explain why certain drugs become ineffective in curing disease after many years of use.   (2mks)
24 a) Define the term immunity.   (1mk)
    b) Distinguish between natural immunity and acquired immunity.   (1mk)
    c) Identify one immunizable disease in Kenya.   (1mk)
25. State three characteristics of members of kingdom Monera that are not found in other kingdoms.   (3mk)