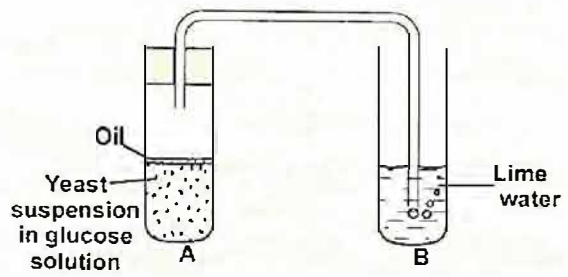
NTIMA, NYAKI AND MUNICIPALITY CLUSTER EVALUATION 2016
KENYA CERTIFICATE OF SECONDAY EDUCATION (K.C.S.E)
BIOLOGY
PAPER 1
(Theory)
July/August 2016
Time: 2 hours

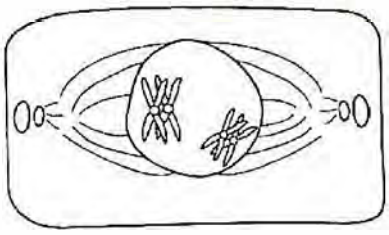
1. Give the name of the following responses:
   i) Curvatures of plant shoot towards light. (1mark)
   ii) Coiling of plant shoot round a supporting structure. (1mark)
2. Part of one strand of a DNA molecule was found to have the following sequence. Show the complementary strand
   G-C-C-A-G-A-T-C-A-C (1mark)
3. Give two differences in content between umbilical vein and umbilical artery. (2marks)
4. Define the following terms as used in ecology.
   i) Carrying capacity (1mark)
   ii) Biosphere (1mark)
5. State taxonomic group that contain:
   i) Individuals with most similarities (1mark)
   ii) The largest number of individuals (1mark)
6. Explain why glucose and proteins are absent in the urine. (3marks)
7. State two essential features of a respiratory surface. (2marks)
8. The equation below represents a certain biological process.

   Sucrose $\xrightarrow[water]{Q} R + Fructose$

   a) Name the process Q (1mark)
   b) Identify substance R (1mark)
9. The diagram below illustrates an experiment to demonstrate a certain biological process. The glucose solution was boiled and then cooled.

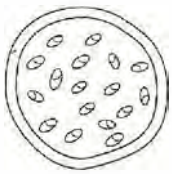


   a) What process is being investigated? (1mark)
   b) i) What observations would you expect in test tube B at the end of the experiment. (2marks)
      ii) Explain the observations made in b(i) above. (2marks)
10. State the field of biology described below:
    a) Study of interrelationship of living things in their surroundings. (1mark)
    b) Study of fossils. (1mark)
11. Name the plant hormone that is involved in topic responses. (1mark)
12. The diagram below represents a certain stage in cell division.



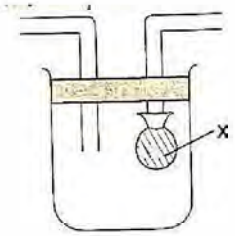
    a) i) Identify the type of cell division. (1mark)
       ii) Give reasons for your answer in a(i) above. (2marks)
    b) State the stage of cell division shown in the diagram above. (1mark)
13. Explain the importance of the following procedures during microscopy;
    i) Use of a cover slip (1mark)
    ii) Mounting the specimen on a drop of water. (1mark)

14. The diagram below represents a certain plant section.



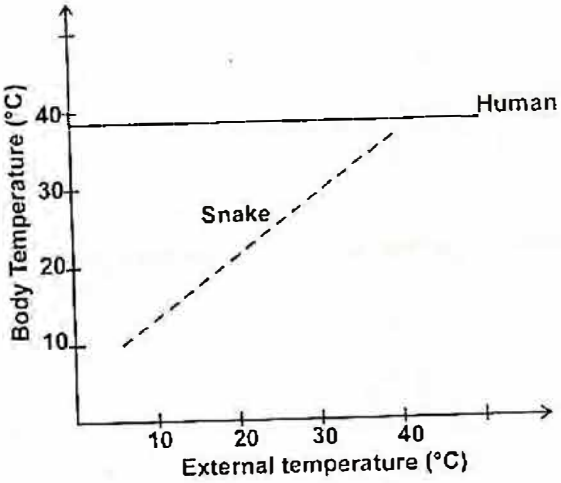
a) Identify the organ from which the above structure was obtained. (1mark)
b) i) State the class to which the plant belongs. (1mark)
ii) Give a reason for your answer in b(i) above. (1mark)

15. Study the diagram below and answer the questions that follow.



a) Identify the apparatus. (1mark)
b) State the functions of the part labeled x. (1mark)

16. State the difference between a cell wall and a cell membrane. (3marks)
17. Identify the type of immunity in the following circumstances:
i) When a baby obtains antibodies through breastfeeding. (1mark)
ii) When a young child suffers from measles and recovers from it. (1mark)
18. The graph below shows the relationship between body temperatures and external temperatures in a human being and a snake. Study it and answer questions that follow.

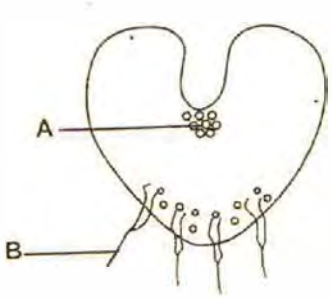


a) What happens to the temperature of each organism as the external temperature increases. (2marks)
Human
Snake
b) Humans are described as homoithermic. State the advantage of this condition. (1mark)

19. State any three characteristics of a population. (1mark)
20. a) What are homologous structures? (1mark)
b) Give two examples of the above structures in animals. (2marks)
21. State the role of paired fins in a bony fish. (2marks)
22. During a field study, a student at Muringa secondary school collected a certain organisms whose actual length was four centimeters. He made a drawing of the organism whose length was 12cm.
Calculate the magnification of the drawing. (2marks)
23. The diagram below represents a certain mammalian tooth. Study it and answer the questions that follow.

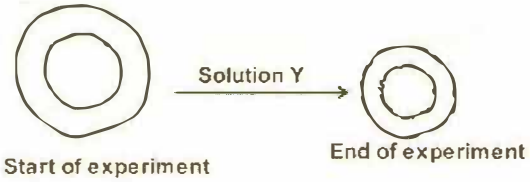
i) Identify the type of tooth. (1mark)
ii) How is the tooth you have identified in (i) above adapted to its function. (1mark)

24. Name three sites for gaseous exchange in terrestrial plants. (3marks)
25. State two hormones that control metamorphosis in insects. (2marks)
26. Study the diagram below and answer the questions that follow. (2marks)



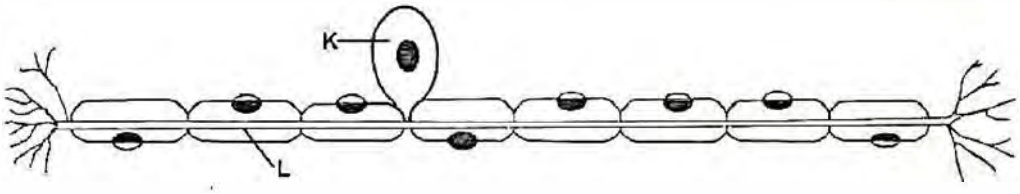
Name the parts labeled A and B. (2marks)

27. What is the process that leads to addition or loss of one or more chromosomes? (1mark)
28. State the importance of support in plants. (3marks)
29. Humans have certain genes on the X chromosomes that lack a corresponding allele on the Y chromosome. Some of these genes are known to be responsible for certain disorders. Name two such disorders. (2marks)
30. Red blood cells from a rabbit were placed in a petri dish containing a certain solution. A drop from the petri dish was then mounted on a slide and observed under a light microscope after 20minutes.
He made the drawings below.



a) Name solution Y (1mark)
b) What term is to is describe the process that took place. (1mark)

31. Give three conditions necessary for seed germination. (3marks)
32. State the functions of the following cell organelles;
a) Centrioles (1mark)
b) Lysosomes (1mark)
33. The diagram below represents a mammalian neurone.



a) Name the parts labeled K and L (2marks)
b) Identify the type of neurone shown in the diagram above. (1mark)
c) What is a synapse. (1mark)

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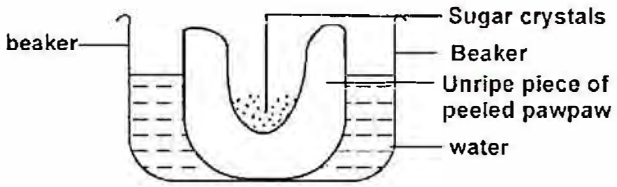
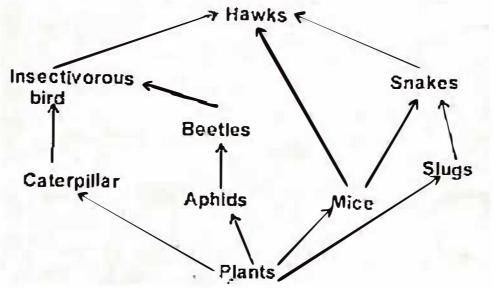
BIOLOGY
PAPER 2
(Theory)
July/August 2016
Time: 2 hours

SECTION A (40 MARKS)

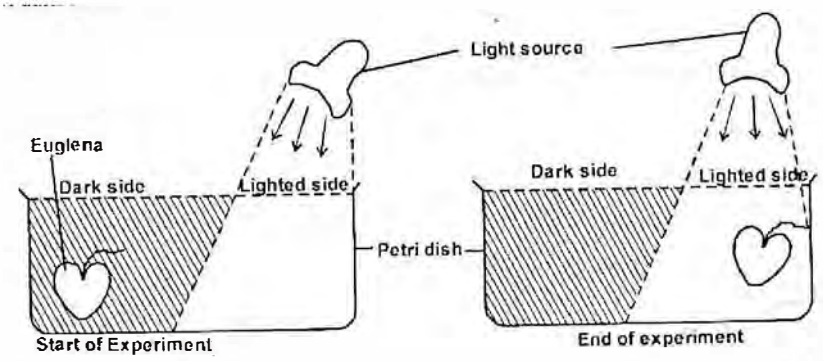
1. Plants with red flowers were crossed with plants with white flowers. The resultant F1 generation had pink flowers.
a) Using R for red flowers and W for white flowers, work out the genotypes of F2 generation. (4marks)
b) Determine the genotypic ratio of F2 generation. (1mark)
c) Explain why a cross between red flowered plants and white flowered plants produced pink flowers. (1mark)
d) If the total number of F2 generation offsprings was 7324. Calculate the number of red flowered plants. (2marks)
2. A group of form 1 West students set up an experiment to demonstrate a certain physiological process. The set up was left to stand for 20minutes.



a) Name the physiological process demonstrated in the experiment (1mark)
b) What observations were made after 20minutes? (2marks)
c) Explain the observations you have made in (b) above. (3marks)
d) State two roles of the process you have made in (b) above. (3marks)
3. Study the food web shown below and answer the questions that follow.



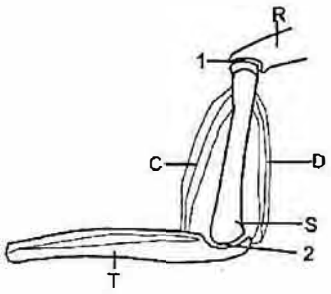
a) Write down two food chains from the web that end with
Tertiary consumer (2marks)
b) Name all the organisms that occupy the second trophic level. (2marks)
c) What is the other name of the second tropic level (1mark)
d) Suggest another group of organisms not shown in the food web but are of great importance in ecosystem. (1mark)
e) What is the short term effect of removing all slugs from the ecosystem. (2marks)
4. In an experiment, Euglena was put in a petri dish. One side of the petri dish was illuminated and the other kept dark as shown below.



a) Name this type of response. (1mark)
b) State the significance of this type of response in an organism. (1mark)
c) Other than light, outline other two factors that may cause change of position in Euglena and state the respective type of response. (2marks)
d) If the above experiment was repeated using a young potted seedling, name the type of response which will be observed. (1mark)

e) Explain the behavior of the seedling after 3 days. (3mark)

5. The diagram below represents a human arm. Study it and answer the questions that follow.



a) Name bone T and R (2marks)
b) Name muscle C and D (2marks)
c) i) Identify the fluid found at joint 2. (1mark)
i) State the function of the fluid in (i) above. (1mark)
d) i) What is the type of the joint found at part labeled 1. (1mark)
ii) Differentiate between a tendon and a ligament. (1mark)

SECTION B:
Answer question 6 (compulsory).

6. Camels are mammals that live in hot dry deserts where daytime air temperature may rise over 40$^{\bullet}$c and fall below 0$^{\bullet}$c at night. The following data shows the body temperature of a camel at different times in one day.

Time of day (24hr clock	2400	0300	0600	0900	1200	1500	1800	2100	2400
Body temps. In 0^0c	37.5	35.5	33.5	37.0	40.0	40.2	40.8	38.8	37.5

a) Plot a graph to show the body temperature of the camel at different times of the day. (6marks)
b) What is the difference between the highest and lowest temperatures of the camel during the period shown by the graph. (1mark)
c) The camel has the following features which allow it to live under the desert conditions. To what advantage are they to the camel?
i) Storing fat under its hump. (2marks)
ii) Storing very little fat under its skin. (2marks)
d) What is the significance of having very low temperatures at 0600hours? (2marks)
e) i) Explain how sweating cools the body. (2marks)
ii) State two excretory wastes lost through the skin. (2marks)
f) Explain what happens to blood vessels in the mammalian skin on a hot day. (2marks)
g) Which part of the brain regulates body temperatures in mammmals. (1mark)

7. a) Explain the mechanism of inhalation in mammals. (10marks)
b) Explain why factors that affect the rate of breathing in humans. (10marks)

8. Explain the causes, the effects and control of air pollution. (20marks)

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KENYA CERTIFICATE OF SECONDAY EDUCATION (K.C.S.E)
231/3
BIOLOGY
PAPER 3
(Practical)
July/August 2016
Time : $1^1/_4$ hours

1. You are provided with soaked bean seeds. Remove and discard the testa of about 10 seeds and crush the cotyledons using a pestle and mortar to obtain a paste. Use the paste for the tests that follow.

a) i) Put 4ml of hydrogen peroxide in a test tube, then add a spatulaful of the paste. Record your observations. (1mark)
ii) Identify the gas evolved in a (i) above and give a reason. (2marks)

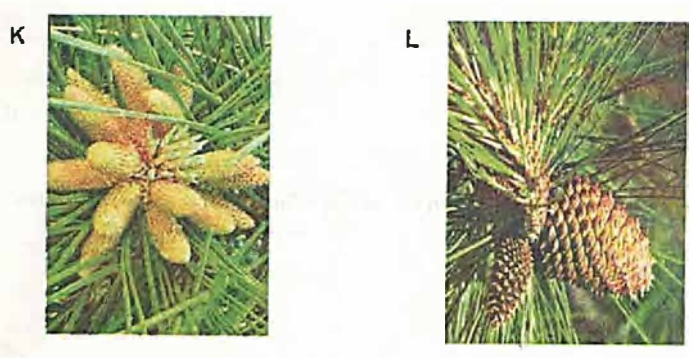
b) Use the reagents provided to carry out food tests on the remaining paste. Record your work in the table below. (6marks)

Food substance	Procedure	Observation	Conclusion

c) What is the nutritional value of paste used? (3marks)

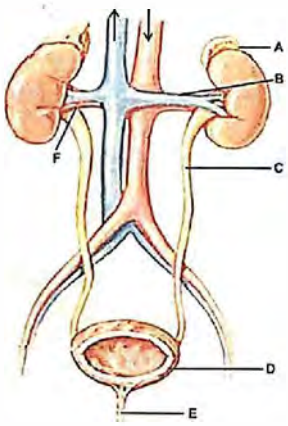
2. a) You are provided with a specimen labeled M. Study it carefully and answer the questions that follow.
i) Using observable features only suggest the most probably type or agent of pollination. (3marks)
ii) Remove the calyx and corolla, and then draw a well labeled diagram of removing part of the specimen M. (5marks)
iii) Identify the type of ovary position exhibited by the specimen M. (1mark)
iv) Explain what happens to the various parts of the flower after fertilization. (4marks)

b) Study the photographs labeled K and L which were obtained from the same plant.



i) Identify the sub-division to which they belong. (1mark)
ii) Give reasons for your answer. (2marks)
iii) Identify the reproductive structure represented in K and L. (2marks)

3. The diagram below represents the urinary system of a mammal. Study it carefully and answer the questions that follow.



a) Name the parts labeled C, D and E. (3marks)
b) i) Identify the part labeled A. (1marks)
ii) State the hormone produced by the part you have identified in b(i) above and its function. (2marks)
c) Which of the blood vessels (B and F) contains:
i) A higher concentration of urea. (1mark)
ii) Lower concentration of oxygen. (1mark)
d) State how the nephrons of desert mammals are structurally adapted. (2marks)