NAME..... INDEX NO.....

231/1
BIOLOGY
PAPER I
TIME: 2 HOURS

2012 PROJECTIONS -001
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES
Answer ALL the questions in the spaces provided.

FOR EXAMINERS USE ONLY

QUESTIONS	TOTAL MARKS	TOTAL SCORE
1 - 30	80	

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1. State two functions of the cell sap.
   (2 marks)

   .....

   .....

2. Briefly explain the role of the external ear (Pinna) in the hearing process.
   (2 marks)

   .....

   .....

3. Distinguish between homologous and analogous structures.
   (2 marks)

   .....

   .....

   .....

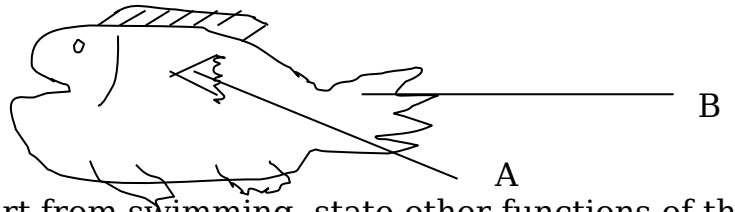
4. An organelle magnified 4000 times by an electron microscope measured 2mm in diameter. Calculate its real diameter in micro-meters.
   (2 marks)

   .....

   .....

   .....

5. The diagram below shows the external structure of Tilapia.



   a) A part from swimming, state other functions of the fins labelled A & B

   .....

   .....

   b) State two functions of swim bladder in a fish.
      (2 marks)

.....

.....

6. State two main differences between a millipede and centipede.
   (2 marks)

   .....

   .....

   .....

7. Which substance causes ripening and falling of fruits
   (1 mark)

   .....

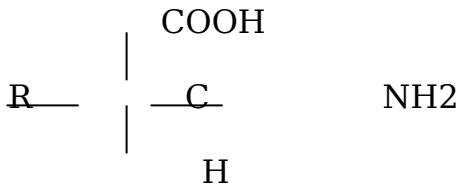
   .....

8. Explain the immediate reaction of the body bathed in cold water. (2 marks)

   .....

   .....

9. Below is the general structure of an amino group



   What do the following refer to?

   COOH –.....

   NH2 –
.....

10. State the functions of vascular bundles in plants.
    (2 marks)

    .....

    .....

11. State two methods by which fossils were formed. (2 marks)

    .....

    .....

12. State three ways of breaking seed dormancy

.....

.....

.....

13. (i) What is a habitat?

.....

.....

(ii) Differentiate between population and a community.

Population –

.....

.....

Community –

.....

.....

(iii) 600 flies were caught and marked. After 24 hrs 400 flies were caught out of which 120 had the marks.
Estimate the population size of the flies in that house.

(2 marks)

.....

.....

.....

14. (i) State three importance of DNA molecule.

.....

.....

.....

(ii) What is DNA replication?

.....

.....

(iii) A DNA strand sequence had the following base sequence TAC GCT. What is the sequence of

M- RNA strand copied from this DNA portion.

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.....

15. Give THREE features that hinder self pollination and self fertilization.

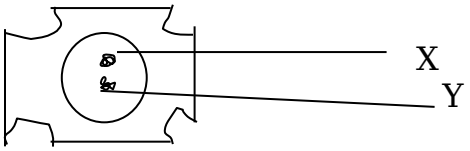
(3 marks)

.....

.....

.....

16. The diagram below shows a mature pollen grain



State the function of the structure labelled.

(2 marks)

...

X.....

.....

Y.....

17. Differentiate between aerotaxis and rheotaxis

(2 marks)

Aerotaxis.....

.....

...

Rheotaxis.....

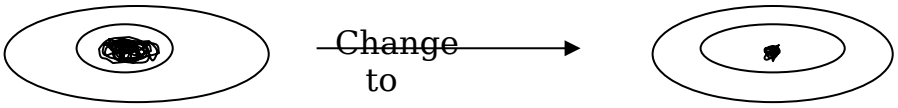
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18. Which structure in the ear detects

a) Sound waves .....(1 mark)

b) Change in posture..... (1 mark)

19. The diagram below shows some changes in the external views of the mammalian eye. Study them and answer the question that follows.



a) Name the stimulus that resulted into the change above (1 mark)

.....

.....

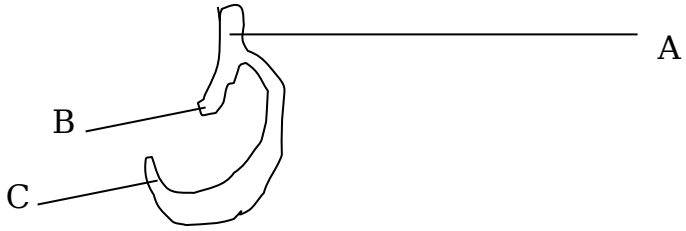
b) Explain the events that led to the change above. (3 marks)

.....

.....

.....

20. Below is a diagram of mammalian rib



(i) Label the part

a) .....

b) .....

(ii) Name the type of bone where part C articulates. (1 mark)

.....

21. What will happen to a small section of fresh pumpkin stem placed in hypotonic solution? (2 marks)

.....

.....

22. State two functions of secretion from sebaceous gland of mammalian skin.

(2 marks)

.....

.....

23. A person consumes a lot of sugar in tea. Briefly explain the feedback mechanism in order to bring the sugar level to norm.

.....

.....

.....

24. Given the equation of respiration:

$C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + \text{Energy}$

a) Name the type of respiration taking place.
(1 mk)

.....

b) Calculate the respiratory quotient (RQ) , use the equation.

(2 marks)

.....

.....

c) Give three (3) economic importance of the process in a above.

(3 marks)

.....

.....

.....

25. (a) What do similarity of wings of bats and those of insects illustrate?

(1 mark)

.....

.....

(b) Name three evidences that show that organic evolution has taken place. (3 marks)

.....

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.....

26. Name TWO sites in the mammalian body where red blood cells are manufactured. (2 marks)

.....

.....

27. State three effects of drug abuse.

(3 marks)

.....

.....

.....

28. State three adaptations of aquatic plants to photosynthesis.

(3 marks)

.....

.....

.....

29. What causes diabetes inspidus?

(1 mark)

.....

.....

30. Differentiate between tendons and ligaments.

(2 marks)

Tendons

.....

.....

Ligaments

.....

.....

NAME…… INDEX NO……

SCHOOL……

.

SIGNATURE……

DATE……

231/1

BIOLOGY

PAPER 1

1¾ HOURS

2012 PROJECTIONS -002
Kenya Certificate Of Secondary Education

INSTRUCTION TO CANDIDATES:

- Write your name and index number in the spaces provided at the top of this page. Sign and write the date o examination in the spaces provided
- Answer all questions
- Answer must be written in the spaces provided in the questions paper
- Additional paper **must not** be inserted

FOR EXAMINER USE ONLY

QUESTION	MAX SCORE	CANDIDATE'S SCORE
1-30	80	

1. How is support provided for in a herbaceous stem? (1mk)

.....

.....

.....

2. State two functions of the cell sap (2mks)

.....

.....

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.....

3. Explain why tadpoles in a certain fish pond failed to become adults through out their cycle?

(2mks)

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4. Explain the biological principles behind the preservation of meat by

(i) Salting (1mk)

.....

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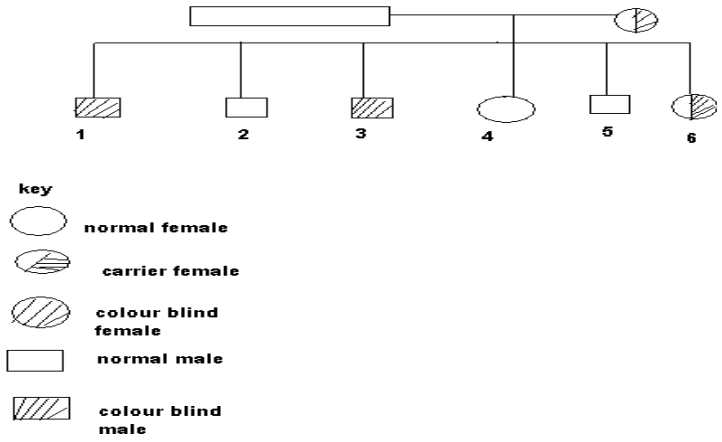
(ii) Refrigeration (1mks)

.....

.....

.....

5. Study the genetic chart below showing the inheritance of gene responsible for colourblindness in a family:



Write the genotype of individuals
(3mks)

1……

2……

6……

6. What is meant by double fertilization?
(2mks)

……

……

……

……

7. State one functional difference between sensory and motor neurons
(1mk)

……

……

8. State two reasons why the class insecta in the phylum arthropoda has the largest number of individuals
(2mks)

.....

.....

.....

.....

9. Why is the transport system in black jack (Bidens pilosa) considered to be more advanced than that of a fern?
(1mk)

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.....

10. Give one merit and one demerit of Lamarck's theory of evolution
(2mks)

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11. Explain why the shortest food chains are always the most efficient
(1mk)

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12. State two reasons why most of the land animals excrete their nitrogenous wastes in form of urea
(2mks)

.....

.....

.....

.....

13. Give a reason why the breakdown of pyruvic acid in the mitochondria occurs in a series of enzyme controlled reaction
(1mk)

.....

.....

.....

14. (a) What is the role of the nasal cavity in the breathing system of mammals (2mks)

.....

.....

.....

(b) State the significance of the following characteristics in respiratory surfaces: (2mks)
(i) Thinness

.....

.....

.....

(ii) Moist

.....

.....

.....

15. (a) Name the other transport system in mammals other than blood system (1mk)

.....

(b) Distinguish between natural acquired immunity and artificial acquired immunity (2mks)

.....

.....

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16. (a) What is the significance of blood clotting

(2mks)

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(b) Explain the reason why blood does not clot in undamaged blood vessels (2mks)

.....

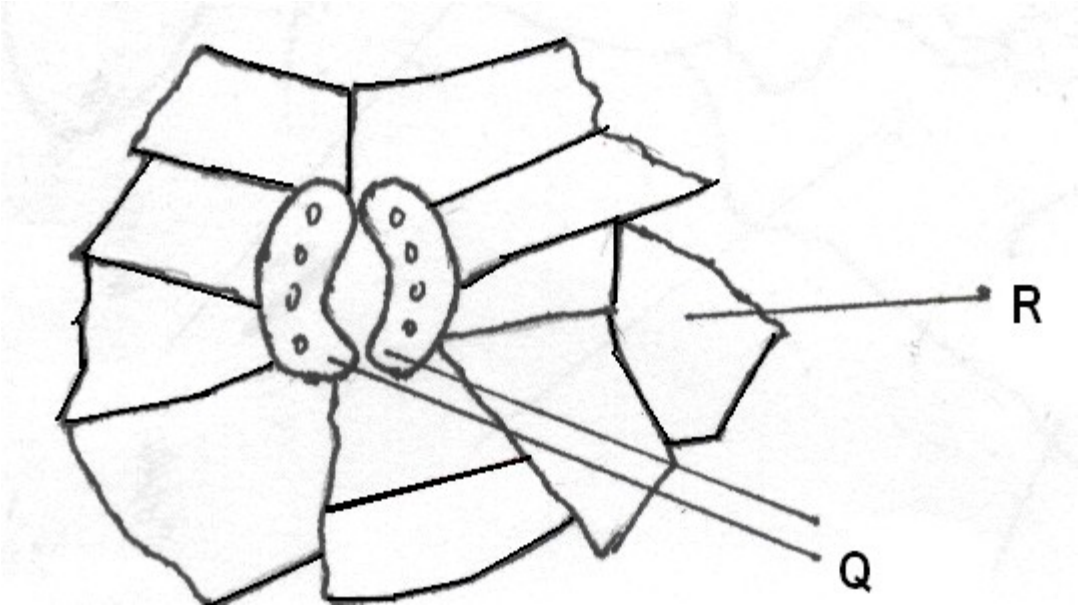
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17. The diagram below represents a structure found in plants



(a) State the function of the structure labeled Q
(1mk)

……

……

(b) Give two structural differences between Q and R
(2mks)

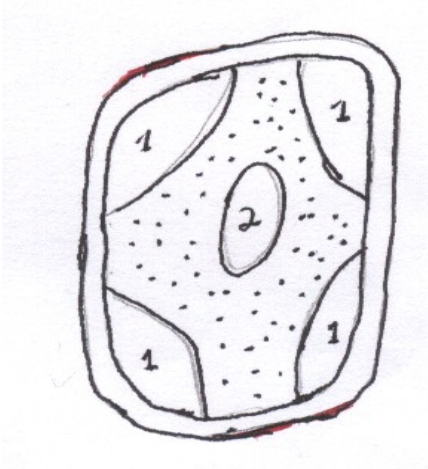
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18. The diagram below shows the appearance of a plant cell after it had been placed in a strong salt solution.



(a) Name the process that is observed in the cell
(1mk)

……

(b) (i) Name the substance present in the region marked 1
(1mk)

……
……

(ii) Explain your answer in (b) above
(2mks)

……
……
……
……
……
……

19. State the function of the following parts of a light microscope:
(2mks)

(a) Diaphragm

……
……

.....

(b) Condenser

.....

.....

.....

20. Name the diseases caused by lack of the following in the human diet (2mks)

(i) Vitamin C

.....

(ii) Phosphorous

.....

21. State three roles played by the bark in plants (3mks)

.....

.....

.....

.....

.....

.....

22. (a) Where are the following muscles located in the human body (2mks)

(i) Skeletal muscles

.....

.....

(ii) Smooth muscles

.....

.....

(b) State three structural differences between the two types of muscles named in (a) above

(3mks)

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.....

(a) Give two causes of discontinuous variations.

(2mks)

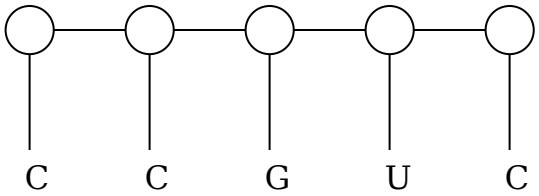
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(b) The sequence below is a portion of a nuclei acid



With a reason identify the nucleic acid to which the portion belongs

(2mks)

.....

.....

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.....

.....

(a) Why are the lipids suitable storage substances in the tissues of organisms?
(1mk)

.....

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.....

(b) Explain why olive oil is different from corn oil whereas the building units of all lipids are fatty acids and glycerol
(2mks)

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23. (a) A patient whose pancreatic duct had blocked was found to have normal blood glucose but the process of digestion was impaired. Explain
(2mks)

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.....

(b) Explain each of the following:
(i) A leaf cannot be tested for starch by adding iodine solution directly
(1mk)

.....

.....

.....

.....

(ii) Plants will not photosynthesize in the dark
(1mk)

.....

.....

.....

24. (a) State two roles of a fruit in a plant
(2mks)

.....

.....

.....

.....

(b) (i) What is the main difference between a ripe and unripe fruit
(1mk)

.....

.....

.....

(ii) Explain what happens in the process of ripening of a fruit
(1mk)

.....

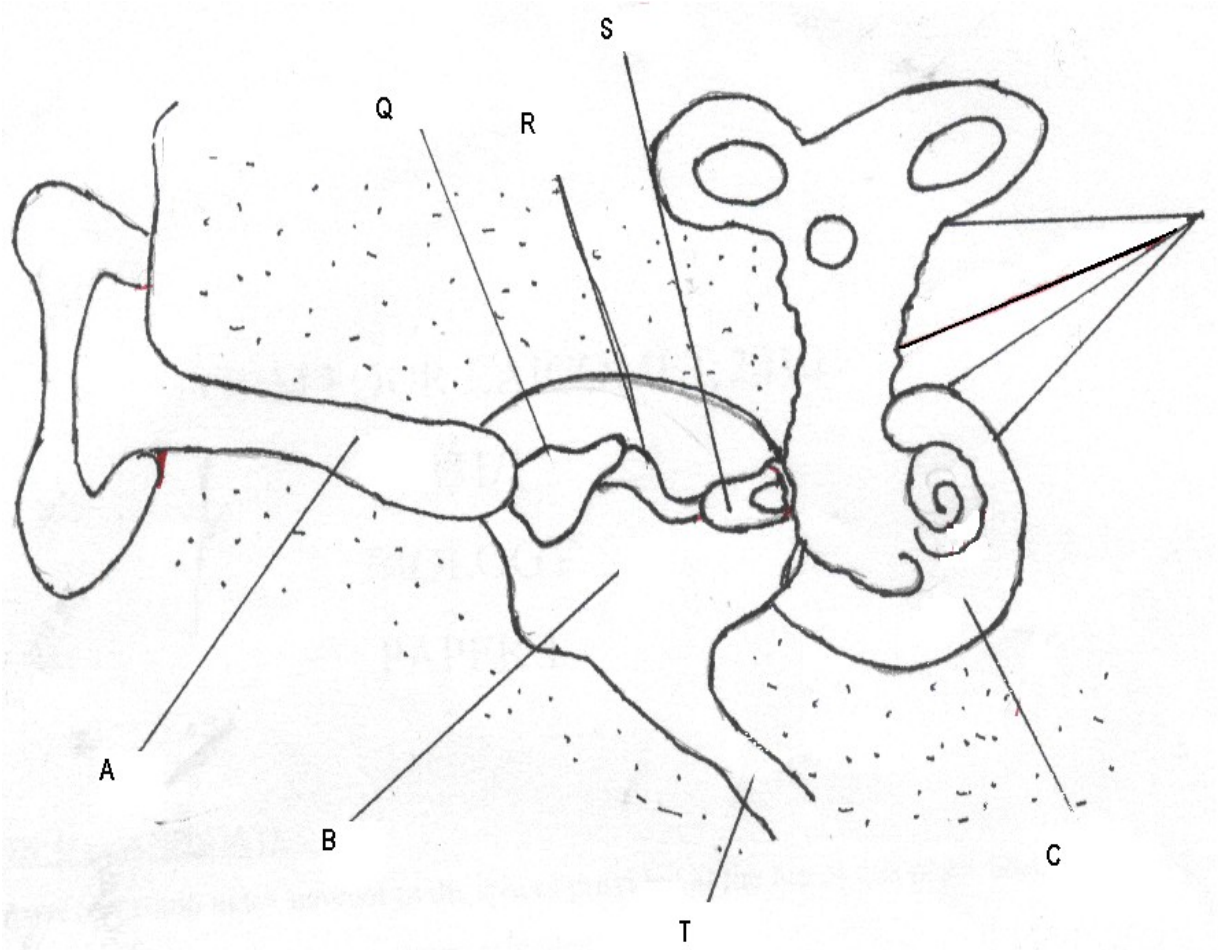
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25. The diagram below shows the internal structure of the mammalian ear



(a) Name the parts labeled Q and S
(2mks)

Q.....

S.....

(b) Explain what would happen if the part labeled T is blocked
(2mks)

.....

.....

.....

26. (a) What is meant by the following terms:

(i) Ecological niche
(1mk)

.....

.....

(ii) Community

(1mk)

.....

.....

(b) What is the importance of the following in an ecosystem?

(i) Bacteria and fungi

(1mk)

.....

.....

(ii) Predators

(1mk)

.....

.....

27. Outline three roles of active transport in the human body

(3mks)

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28. (a) State the role of enzyme catalase in living cells
(1mk)

.....

.....

(b) Which factor inactivates enzyme action?
(1mk)

.....

.....

.....

Name_____ Index No: _____

231/1
BIOLOGY
THEORY
JUNE/AUGUST 2010
PAPER 1
2 HOURS

2012 PROJECTIONS -003
Kenya Certificate Of Secondary Education

INSTRUCTION TO CANDIDATES

Answer all the questions in the spaces provided

1-32	80
CANDIDATE SCORE	

This paper consist of 9 printed pages

Please Turn Over

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1. State two properties of the cell membrane.
(2mks)

2. Outline two precautions taken during collection and observation of live specimens.
(2mks)

3. (a) What is the formula for calculating linear magnification using a light microscope.
(1mk)

(b) State two functions of centrioles. (2mks)

4. Describe how diffusion gradient affects the rate of diffusion.
(3mks)

5. What is a guard cell? (2mks)

6. State the specific sites in which the following reactions occur:
(2mks)
(i) Light stage.

_____

_____

_____

(ii) Dark stage.

_____

_____

_____

7. Plants relatively have less waste to excrete than animals. Giving two reasons to explain this
Observation. (2mks)

_____

_____

_____

_____

8. (a) Name the gap in the lower jaw of a herbivore that facilitate movement of the tongue
during chewing. (1mk)

_____

_____

_____

(b) Name two substances absorbed into the blood from the stomach in man.
(2mks)

_____

_____

_____

_____

9. (a) Give two reasons why lower organisms such as bacteria and simple multicellular Organisms do not have an elaborate transport system.
(2mks)

_____

_____

_____

_____

(b) Explain how the shape of erythrocytes helps it to function efficiently. (1mk)

10. Explain leaf fall as a factor affecting transpiration rate.
(3mks)

11. List three structures where gaseous exchange occurs in amphibians.
(3mks)

12. State two causes of Asthma. (2mks)

13. Give two factors affecting the rate of respiration. (2mks)

14. (a) Aerenchyma tissues and pneumatophores are found in plants occupying different Habitats, Identify these habitats. (2mks)

(b) What is the function of pneumatophores? (1mk)

_____

_____

15. Name two excretory products produced by both plants and animals.
(2mks)

_____

_____

_____

_____

16. What is the meaning of the following terms as they apply to cells
(i) Eukaryotes. (1mk)

_____

_____

_____

(ii) Prokaryotes. (1mk)

_____

_____

_____

17. What is the effect of anti-diuretic hormone (ADH) in the human body.
(2mks)

_____

_____

_____

_____

18. State two classes of the phylum chordata where all members are endothermic.
(2mks)

_____

_____

_____

_____

19. State two ways in which parasitic worm of the genus schistosoma gains entry into the
body of human beings. (2mks)

_____

_____

_____

_____

20. (a) Name the stage in mitosis where chromatids collect together at the two opposite ends of the spindle fibres. (1mk)

_____

_____

_____

(b) State two roles of the placenta in humans.
(2mks)

_____

_____

_____

_____

21. Describe the censor mechanism of seed dispersal.
(2mks)

_____

_____

_____

_____

22. The diagram below shows the internal structure of a bean seed
A B C

(a) Name the parts labeled A and B.
(2mks)

_____

_____

_____

_____

(b) What is the role of the structure labeled C? (1mk)

_____

_____

23. (a) Define the following term
Incomplete metamorphosis. (1mk)

(b) State one function of each of the following hormones (2mks)
(i) Juvenile hormone.

(ii) Ecdysone.

24. State the category of variation into which the following traits fall (2mks)
(i) Blood group.

(ii) Skin pigmentation.

25. Differentiate between heterozygosity and homozygosity. (2mks)

26. Explain “struggle for existence” and “survival of the fittest” as they apply to natural Selection. (4mks)

27. State three differences between transmission through the endocrine system and nervous System. (3mks)

28. (a) (i) Which eye defect is corrected by bifocal lens. (1mk)

(ii) Name one cause of the eye defect. (1mk)

29. State three reasons why plants need support. (3mks)

30.

(a) Identify the type of muscle shown above (1mk)

_____

_____

_____

(b) Name two parts in the human body where the type of muscle named in (a) above
is found (2mks)

_____

_____

_____

_____

31. (a) Name two components of the endoskeleton
(2mks)

_____

_____

_____

_____

(b) The exoskeleton limits continuous growth. Explain (1mk)

_____

_____

_____

_____

32. What is the function of a swim bladder in fish?
(2mks)

_____

_____

_____

_____

NAME …… DATE ……

INDEX NO. …… CANDIDATE'S SIGNATURE ……

231/1
BIOLOGY
PAPER 1
(THEORY)
TIME : 1½ HOURS.

2012 PROJECTIONS -004
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES.

- Write your name and index number in spaces provided above.
- Sign and write the date.
- You are required to spend the first 15 minutes of the 1 ½ hrs allowed for the paper reading the whole paper carefully before commencing your work.
- Answer **ALL** the questions in the spaces provided.
- Answers must be written in the spaces provided in the question paper. Additional pages must not be inserted.

FOR EXAMINER'S USE ONLY.

Questions	Maximum score	Candidate's score
1- 27	80	

This paper consists of 7 printed pages.
Candidates should check to ensure that all pages are printed as indicated and no questions are missing

1. (a) Explain why lysosomes are sometimes called 'suicidal bags'
1 mark

.....

.....

.....

(b) Why are lysosomes more frequent in the phagocytotic cells than in other cells? 2 marks

.....

.....

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.....

2. Distinguish between osmosis and active transport

2 marks

.....

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.....

3. The diagram below shows the base sequence of part of a nucleic acid strand.

T-T-A-G-C-T-G-A

(a) Giving a reason state whether it is part of a DNA or a RNA strand.

1 mark

.....

.....

.....

(b) Show the complementary RNA strand.

1 mark

.....

.....

4. State **three** structural differences between biceps muscles and muscles of the gut.

3 mark

.....

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.....

5. Sugar was detected in the urine of a patient during a laboratory test.

(a) Name the type of sugar that was detected 1 mark

.....

(b) Name the hormone that is likely to have been deficient.

1 mark

.....

(c) What is the name given to the condition the person was suffering from?

1 mark

.....

6. Name the causative agent of the following human diseases.

3 marks

i) Pneumonia

.....

ii) Cholera

.....

iii) Gonorrhoea

.....

7. Name **two** classes of phylum arthropoda which have a cephalothorax.

2 marks

.....

.....

8. State **three** adaptations of the proximal convoluted tubule to its function.

3 marks

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.....

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9. (a) What is single circulatory system?

1 mark

.....

.....

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

1 mark

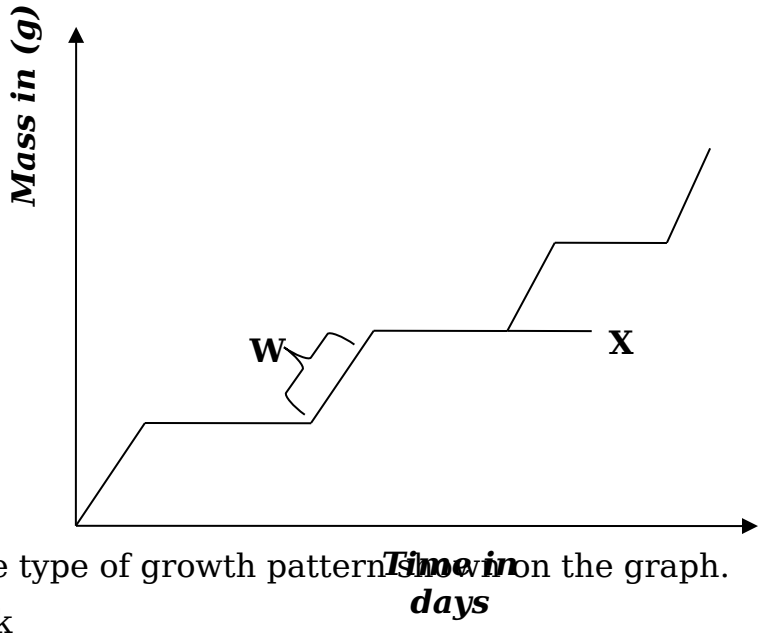
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(c) Name the opening to the chamber of the heart of an insect

1 mark

.....

10. The graph below represents the growth of animals in a certain phylum



(a) Name the type of growth pattern shown on the graph.
1 mark

.....

(b) Identify the process represented by X. 1 mark

.....

(c) Name the hormone responsible for the process in (b) above
1 mark

.....

11. (a) State the meaning of the following terms used in floral biology:
3 marks

(i) Incomplete flower

.....

.....

(ii) Actinomorphic flower

.....

.....

(iii) Zygomorphic flower

.....

.....

12. Explain why Lamarck's Theory of evolution is not accepted by biologists today.
2 marks

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.....

13. State **two** types of movable joints found in mammals.
2 marks

.....

.....

14. State how alveolus of the lungs of a mammal is adapted to its function.
2 marks

.....

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.....

.....

15. Two heterozygous pea plants were crossed. 40 seeds were collected

(a) How many of these seeds were likely to be homozygous?
1 mark

.....

(b) How many different genotypes are there in the offsprings?
1 mark

.....

16. (a) Name **three** types of cells that carry out photosynthesis.
3 marks

.....

.....

17. (a) What is environmental degradation?
1 mark

.....

.....

(b) State **three** cases of environmental concern that have resulted from the increased human population

in recent years 3 marks

.....

.....

.....

18. Explain the role of the following factors in breaking seed dormancy

2 marks

(a) Light

.....

.....

(b) Soaking in water

.....

.....

19. (a) What is meant by the term *sex-linkage?*

2 marks

.....

.....

.....

(b) Name two sex-linked traits in humans

2 marks

.....

.....

20. What is the role of vascular bundles in plant nutrition?

3 marks

.....

.....

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.....

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.....

21. (a) Where in a mammal is the ovum fertilized?

1 mark

.....

(b) State **three** adaptations of human spermatozoa that enhances the process of fertilization

3 marks

.....

.....

.....

22. Enzyme + Substitute $\rightleftharpoons$ Enzyme + Product

From the equation above name **two** properties of enzymes exhibited in the equation 2 marks

.....

.....

23. For each of the following types of cells state **one** way in which it is different from a typical animal cell. State the function of each type of cell.

a. Cell lining the trachea (windpipe)

1 mark

.....

.....

.....

b. Red blood cell 2 marks

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24. (a) What is homeostasis?

1 mark

.....

.....

.....

(b) Name **three** processes in the human body in which homeostasis is involved. 3 marks

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25. (a) State **two** ways by which plants compensate for their inability to locomote
2 marks

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.....

.....

(b) Explain why herbaceous plants don't grow to great heights
1 mark

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.....

.....

26. Give reasons why a woman excretes less urea when she becomes pregnant
2 marks

.....

.....

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.....

27. State the functions of the following parts of the microscope
2 marks

a. (i) Condenser

.....

.....

(ii) Mirror

.....

.....

b. State the importance of the following in microscopy:
2 marks

(i) Cutting thin sections

.....

(ii) Staining

.....

Name..... **Index No**.....

School..... **Candidate's**

sign.....

Date.....

231/1
BIOLOGY
(THEORY)
PAPER 1
Time: 2 Hours

2012 PROJECTIONS -005
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

- Write your name, school and Index number in the spaces provided above.
- Answer **ALL** the questions in the spaces provided

For Examiners Use Only

Question	Maximum	Score
1 -31	80	

This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. Define the following terms. (2mks)

i) Photolysis .....

ii) Glycolysis .....

2. a) State two characteristics of pteridophytes
(2mks)

.....

.....

b) What is the function of rhizoids in liverworts (1mk)

.....

3. a) State the condition when the genetic make-up of an organism is altered
(1mk)

.....

b) State the effect of cyanide gas on respiration (1mk)

.....

4. State the branch of biology that deals with the study of:
(1mk)

i) Insects ..... (1mk)

ii) The relationship between organisms and their environment
(1mk)

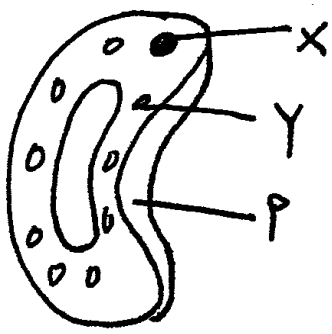
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5. To which class does an animal with many segments, and two pairs of legs per segment belong?

(1mk)

.....

6. The diagram below represents a cell



a) Name the parts labeled X and Y (2mks)

X .....

Y .....

b) Of what importance to the cell is the thickened part labeled P.

(1mk)

.....

7. Why is xylem tissue regarded as a mechanical tissue?

(2mks)

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.....

8. What is the role of spindle fibers in cell division (1mk)

.....

.....

9. Name the organism that causes

(2mks)

i) Amoebic dysentery .....

ii) Syphilis .....

10. Explain the effect of growth inhibitors on the germination of seeds.

(2mks)

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11. a) How is the structure of the cornea of the eye adapted to its function?
(2mks)

.....

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b) How is long sightedness corrected?
(1mk)

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.....

12. a) Name the muscle found in between the ribs of mammals (1mk)

.....

b) State the function of the muscle named in (a) above
(1mk)

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.....

13. a) Name the valve that prevents blood in the right ventricle flowing back into the right atrium
(1mk)

.....

b) State two ways in which arteries are adapted to their function
(2mks)

.....

.....

14. Distinguish between predation and parasitism
(3mks)

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15 What is the meaning of the following terms

i) Fermentation (1mk)

.....

ii) Oxygen debt (1mk)

.....

16 a) State one characteristics that is common to all members of a species (1mk)

.....

b) Why are scientific names written in latin?

(2mks)

.....

.....

17. a) State the process that occur in metaphase I of meosis

(2mks)

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b) What is the significance of mitosis

(2mks)

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18. Name three environmental factors that stimulate / increase the rate of photosynthesis. (3mks)

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19. State the use of the following apparatus

i) Pooter (1mk)

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ii) Sweep net (1mk)

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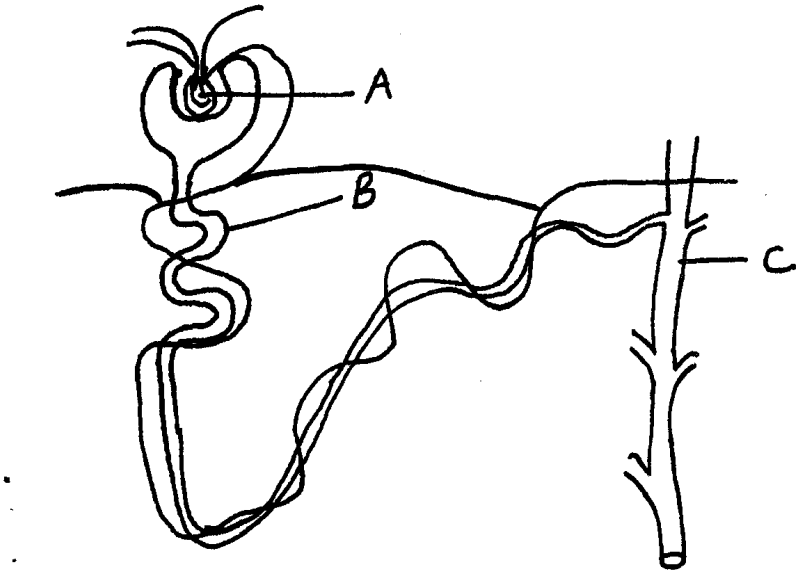
20. State two functions of a cell sap in plant cells
(2mks)

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21. The diagram below represents a nephron of a mammal



a) Name the parts labeled A and B (2mks)

A .....

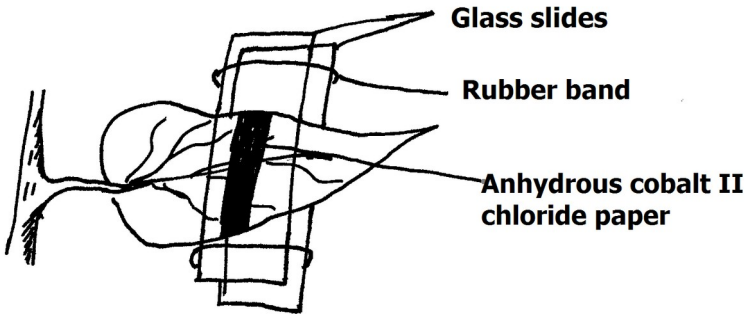
B .....

b) Name the major substance whose concentration remains the same between region A and region

C (1mk)

.....

22. A teacher set-up the apparatus below to investigate a certain phenomena. The cobalt (ii) chloride paper was placed on the upper and lower surfaces of the leaf as shown.



i) What was the aim of the experiment? (1mk)

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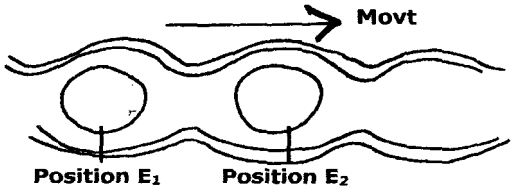
ii) What observations were made after 2hrs?
(2mks)

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23. The diagram below shows how food moves along the human esophagus and intestines



a) Identify the process illustrated in the diagram
(1mk)

.....

b) Explain the movement of the food bolus from position E_1 to Position E_2
(2mks)

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c) Name ONE component of the human diet that assists in the movement in (b) above (1mk)

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24. a) What is sex-linkage (1mk)

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b) Name Two sex-linked traits in man. (2mks)

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25. Suggest the reasons for each of the following:

a) Distribution of xylem tissue in roots is central (2mks)

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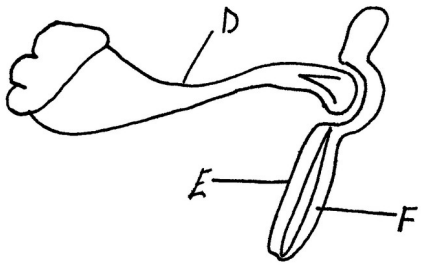
b) Distribution of xylem tissue in stems is peripheral in a ring in dicots or scattered in monocots.

(2mks)

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26. The diagram below shows the articulation of bones of the left fore-limbs of a rabbit.



a) On the diagram, identify the bones labeled E and F (2mks)

E .....

F .....

b) Name the type of joint found at the distal end of the bone labeled (1mk)

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27. Describe dichogamy (3mks)

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28. What is the difference between Darwinian and Lamarkian theory of evolution? (2mks)

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29. Name the mineral elements that are necessary in the synthesis of chlorophyll. (3mks)

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30. State the functions of the following parts of a mammalian skin:- (3mks)

a) Nerve endings

.....

b) Blood capillaries

.....

c) Erector muscles

.....

31. a) In a garden with plants of the same species 705 plants had red flowers while 224 had white

flowers. Work out the ratio of red to white flowered plants. (2mks)

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b) What is incomplete dominance? (1mk)

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END

Name…… **Index No.** ……

School …… **Date**……. ……

Sign……. ……

231/1
BIOLOGY
PAPER 1
Time: 2 Hours

2012 PROJECTIONS -006
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

- Answer ALL the question.

FOR EXAMINERS USE ONLY

QUESTION	Max Score	Candidate Score
1 – 28	80	

This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. Why are green plants referred to as primary producers in the ecosystem. (2mks)

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2. A person whose blood group is AB requires a blood transfusion. Name the blood groups of the donors.
(1mk)

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3. Name the part of the flowers that is responsible for production of gametes.
(2mks)

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4. State two functions of muscles found in the alimentary canal of mammals.
(2mks)

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5. Adult elephants flap their ears twice as much as their calves in order to cool their bodies when it is hot. Explain.
(2mks)

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6. Name the blood vessel that transports blood from :-

(i) Small intestines to the liver.
(1mk)

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.....

(ii) Lungs to the heart
(1mk)

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7. Name three types of chromosomal mutations.
(3mks)

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8. Name three sites where gaseous exchange takes place in terrestrial plants.
(3mks)

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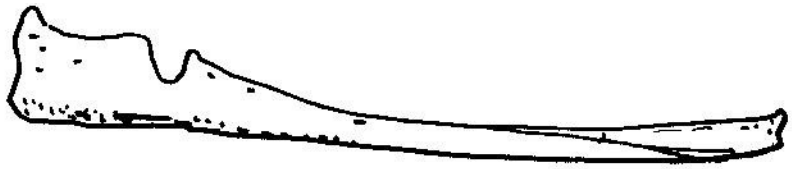
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9. A bone obtained from a mammal is represented by the diagram below.



a) Name the bone. (1mk)

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b) Which bones articulates with the bone shown in the diagram at the notch?
(2mks)

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10. Name the phylum whose members possess notochchord.
(1mk)

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11. Distinguish between analogous and homologous structures.
(2mks)

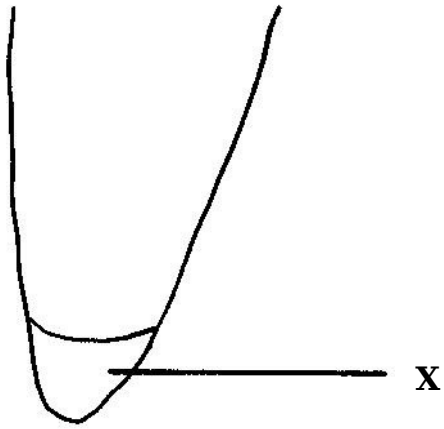
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12. The diagram below represent regions of a root tip.



a) Name the two regions above X in ascending order.
(2mks)

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b) State the function of the part labeled X.
(1mk)

.....

13. Name the :

a) Material that strengthen xylem tissue.
(1mk)

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b) tissue that is removed when the bark of a dicotyledonous plant is ringed.
(2mks)

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14. a) Distinguish between diffusion and osmosis.
(2mks)

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b) Outline **three** roles of active transport in the human body.
(3mks)

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15. How is the epidermis of a leaf of green plant adapted to its functions.
(2mks)

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16. a) State two main branches of biology.
(2mks)

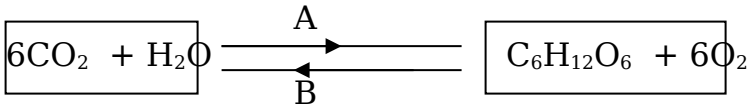
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17. The scheme below shows two inter-related process A and B that occur in the same cell.



a) Identify process A and B
(2mks)
A .....

B .....

b) From the diagram, state two differences between process A and B.
(2mks)

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18. What is the difference between Darwinian and Lamarkian theories of evolution.
(2mks)

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19. a) Name the hormone that is responsible for apical dominance .
(1mk)

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b) What is thigmotropism. (1mk)

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20. a) State two benefits of excretory products in plants.
(2mks)

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b) What is the role of ADH in osmoregulation.
(2mks)

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c) Name the disease caused by insufficient production of ADH in human.
(1mk)

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21. Give **three** importance of meiosis.
(3mks)

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22. State the events that take place during inhalation.
(3mks)

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23. Name the organelled that:-

a) Manufacture and transport lipids and steroids in a cell.
(1mk)

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b) Contain enzymes that are capable of destroying old damaged cells.
(1mk)

.....

c) Control all the processes in a cell.

(1mk)

.....

d) Form cilia and flagella in cells that have them.

(1mk)

.....

24. The scheme below shows a process that takes place in the human gut.

Trypsinogen + substance K ⟶ Trypsin

a) Name substance K

.....

b) In which part of the gut does the process occur.

(1mk)

.....

c) Name the substrate that is acted upon by trypsin and the product formed.

(2mks)

Substrate .....

.....

Product .....

.....

25. Define the following terms

(i) Allele (1mk)

.....

.....

(ii) Zygote

(1mk)

.....

.....

(iii) Mutant

(1mk)

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26. Explain why division Pteridophyta is considered more advanced than division Bryophyta. (3mks)

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27. Explain how the following abiotic factors affect plants.

a) Wind

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b) Atmospheric pressure.

(2mks)

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28. Describe what happens during the light stage of photosynthesis.
(3mks)

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END

END

END

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Name..... **Index No**.....

School..... **Candidate's**

sign.....

Date.....

231/1
BIOLOGY
PAPER 1
2 HOURS

2012 PROJECTIONS -007
Kenya Certificate Of Secondary Education

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 this paper in the spaces provided.

FOR EXAMINER'S USE ONLY

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1 – 28	80	
TOTAL SCORE	80	

This paper consists of 12 printed pages. Candidates should check carefully to ascertain that all the pages are printed as indicated and no questions are missing.

1. What is active transport?
(2mks)

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2. Give three adaptations of animal dispersed fruits and seeds
(3mks)

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3. State three functions of golgi apparatus
(3mks)

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4. a) What is the difference between Darwinian and Lamarakian theories of evolution? (2mks)

.....

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.....

b) Distinguish between convergent and divergent evolution
(1mk)

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.....

5. State the characteristics that can separate the following organisms into respective classes;

Millipedes, tsetsefly and spider

(3mks)

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.....

6. Name the blood vessel that transports blood from;

a) Heart to the lungs

(1mk)

.....

.....

b) Small intestine to the liver

(1mk)

.....

.....

7. State three ways in which the tracheole system in insect is adapted for gaseous exchange (3mks)

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8. State the role of the following hormone in the organisms:

a) Auxin (1mk)

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b) Antidiuretic hormone
(1mk)

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.....

9. Name three types of gene mutations
(3mks)

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10. Name the spore producing structures in:
a) Bryophytes (1mk)

.....

.....

b) Pteridophytes
(1mk)

.....

.....

11. a) During which phase of meiosis does crossing over occur?
(1mk)

.....

.....

b) How do identical and fraternal twins arise?
i) Identical twins
(2mks)

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.....

ii) Fraternal twins (2mks)

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12. Which one of the cell organelles would be found in large numbers in;

a) An enzyme secreting cell

(1mk)

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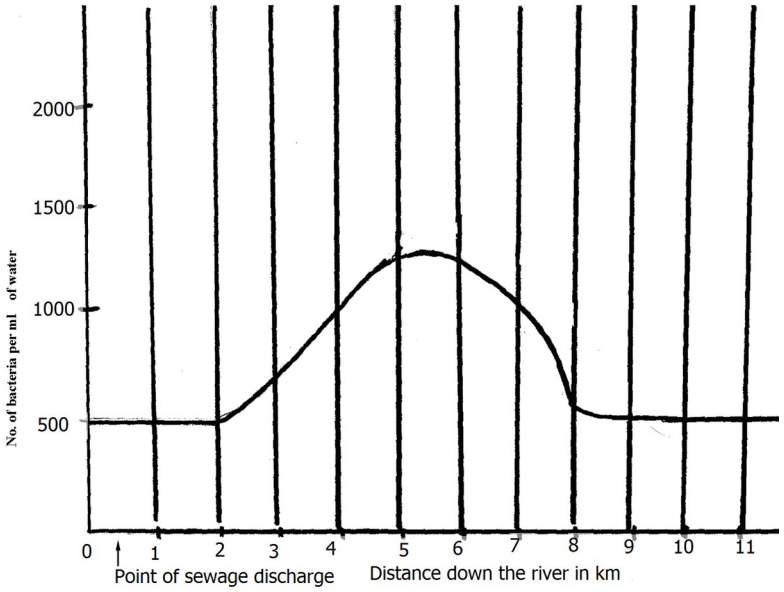
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b) A rapidly respiring cell in comparison to other cells in the same organism (1mk)

.....

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13. The graph below is of sewage on the population of a species of bacteria in a certain river.



Account for the changes in population of bacteria between 2 and 10 kilometres down the

river (2mks)

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14. Differentiate between interspecific and intraspecific competition
(2mks)

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15. Other than energy, name the other products of anaerobic respiration in plants
(2mks)

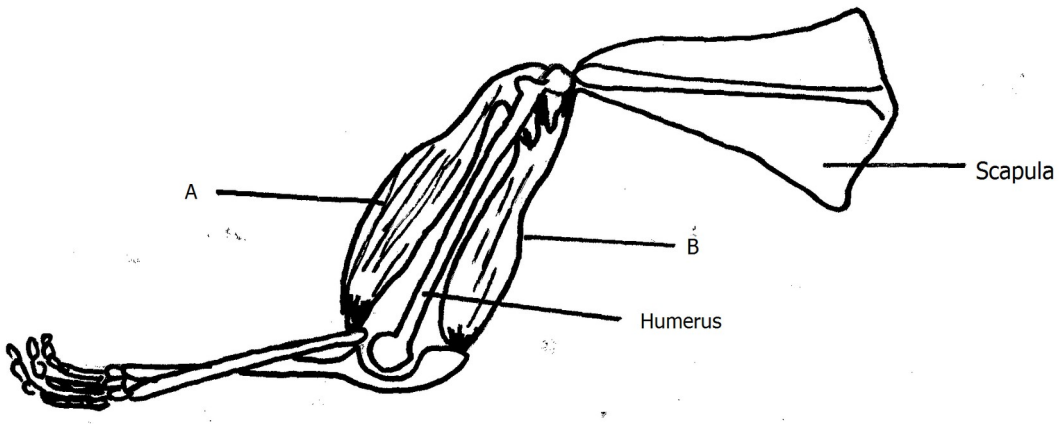
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16. a) Study the diagram below and answer the questions that follow.



i) Name the muscles labeled A and B
(2mks)

A .....

B .....

ii) What happens to each muscle as the arm is stretched.
(2mks)

.....

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17. In an accident, a victim suffered brain injury. Consequently he had loss of memory.

Which part of the brain was damaged?

(1mk)

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18. Name three membranes that surround the central nervous system

(3mks)

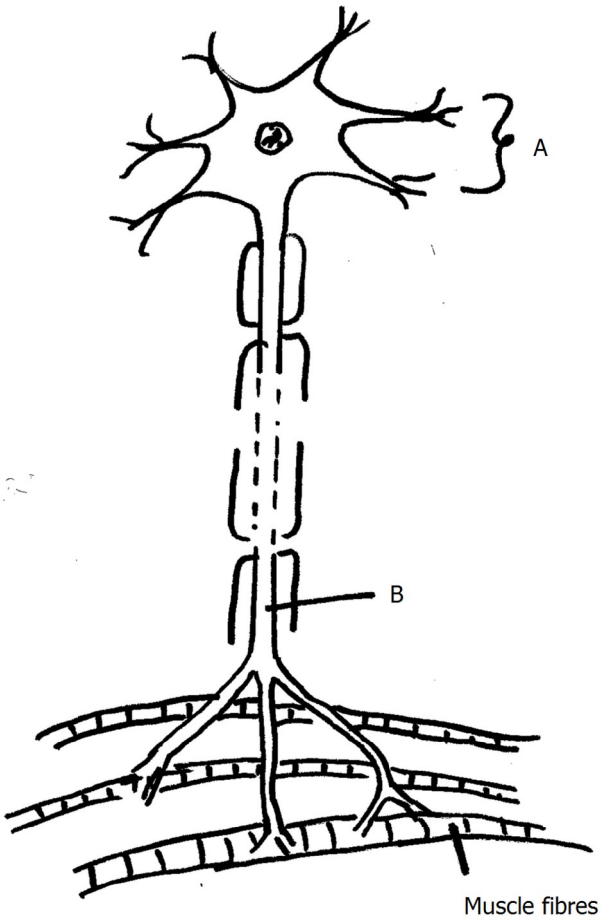
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19. The diagram below represents a neurone



i) Name the neurone

(1mk)

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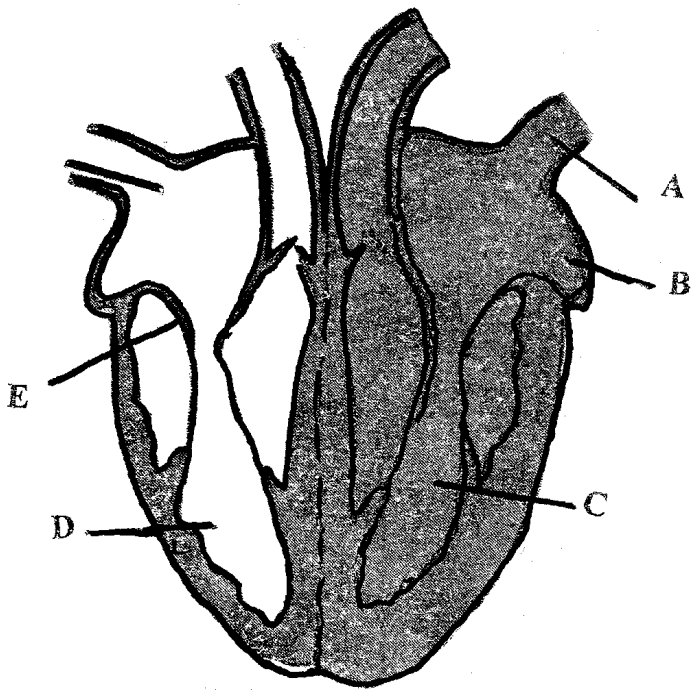
ii) Name the parts labeled A and B

(2mks)

A .....

B.....

20. The diagram below shows a vertical section through a mammalian heart



a) Name the parts labeled A and E

(2mks)

A……

B ……

b) Give a reason why the wall of chamber C is thicker than chamber D.

(2mks)

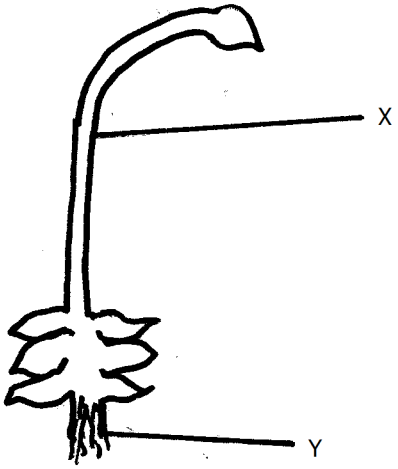
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21. The figure below represents a plant.



a) State the division it belong to?
(1mk)

.....

.....

b) Label the parts X and Y (2mks)

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22. State two ways in which xylem vessels are adapted to their function
(2mks)

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23. a) List two differences between simple reflex action and conditioned reflex action (2mks)

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b) State any two functions of cerebellum

(2mks)

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24. a) What is seed dormancy?

(1mk)

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b) Account for the following phases of a sigmoid curve of growth of an organism.

i) Lag phase (1mk)

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.....

ii) Plateau phase

(1mk)

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25. State two characteristics of aerenchyma tissue

(2mks)

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26. What is the significance of transpiration to plants?
(4mks)

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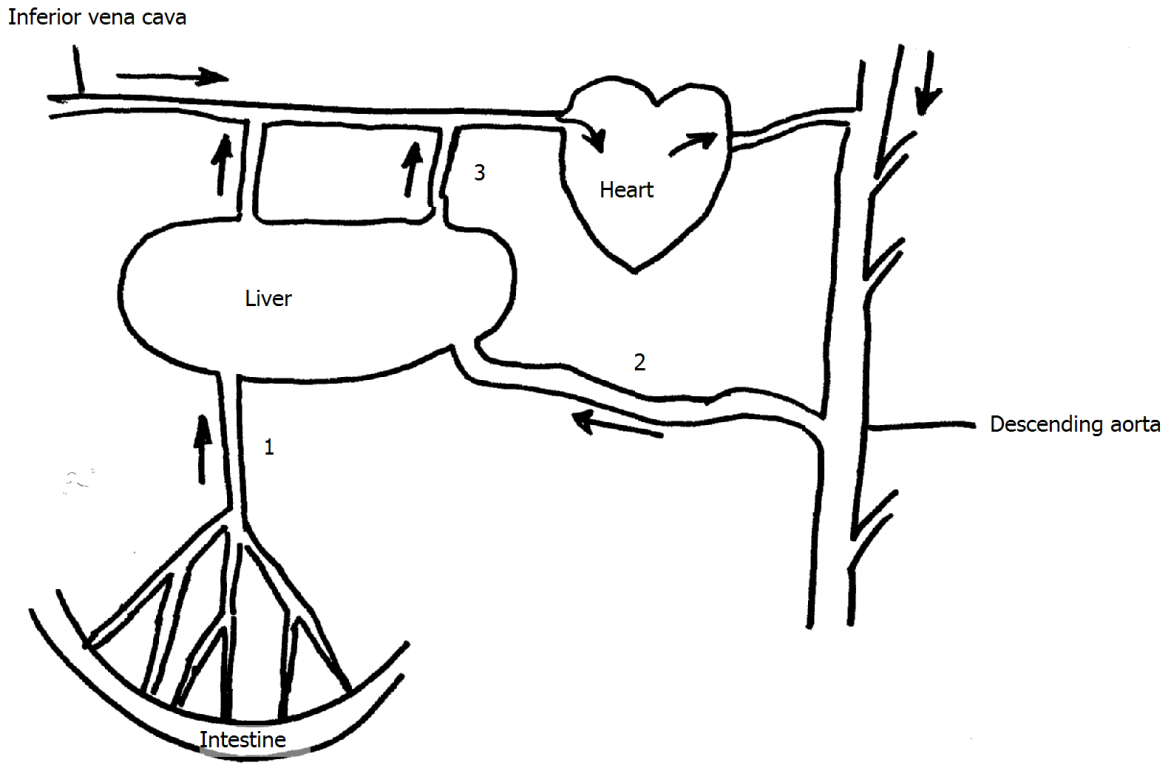
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27. The figure below illustrates the blood supply and drainage of the liver.



a) In which of the blood vessels labeled 1, 2 and 3 would you expect the highest

concentration of glucose two hours after eating a starchy meal? Give a reason (2mk)

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b) Name one nutrient that is only transported in small quantities in vessel 1 following

absorption. (1mk)

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28. a) Name two classes of animals that excrete their nitrogenous waste products mainly in

Form of uric acid.

(2mks)

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b) State how excretion is achieved in plants

(2mks)

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NAME……
INDEX NO……
SCHOOL……

Candidate's signature ……

Date……

231/1
BIOLOGY
PAPER 1
(Theory)

2012 PROJECTIONS -008
Kenya Certificate Of Secondary Education

231/1
BIOLOGY
PAPER 1

INSTRUCTIONS TO CANDIDATES.

- Write your name and Index Number in the spaces provided.
- Sign and write the date of examination in the spaces provided above.
- Answer ALL the questions in this paper in the spaces provided.
- Candidate should check the question paper to ascertain the pages are printed as indicated and no questions are missing

1. Some form one students wanted to collect the following animals for study in the laboratory. State the suitable apparatus they should use.
   (3mks)
   (i) Flying insects

(ii) Crawling stinging insects

(iii) Small animals from tree barks

2. State the transport and synthetic roles of endoplasmic recticulum (2mks)

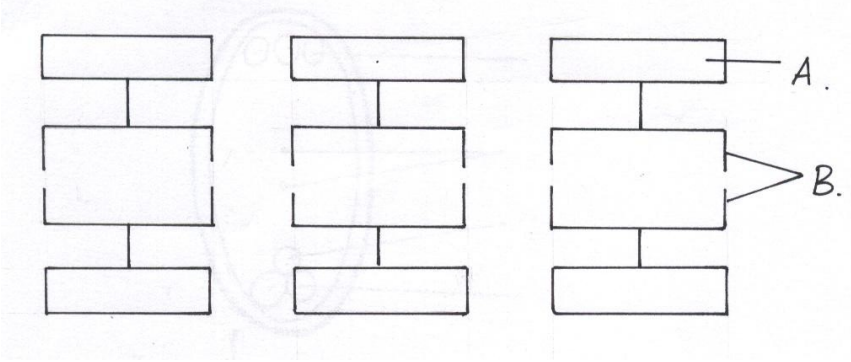
   i. Transport role

   ii. Synthetic role

3. (a) What is the significance of diffusion to plant pollution (1mk)

   (b) Explain movement of air molecules is not energy-driven process (1mk)

4. The diagram below represents an organelle of a cell



(a) Identify the organelle
(1mk)

(b) Name the parts labeled A and B
(2mks)

A.....

B.....

(c) State the function of the above structure
(2mks)

5. (a) Define the term respiratory quotient
(1mk)

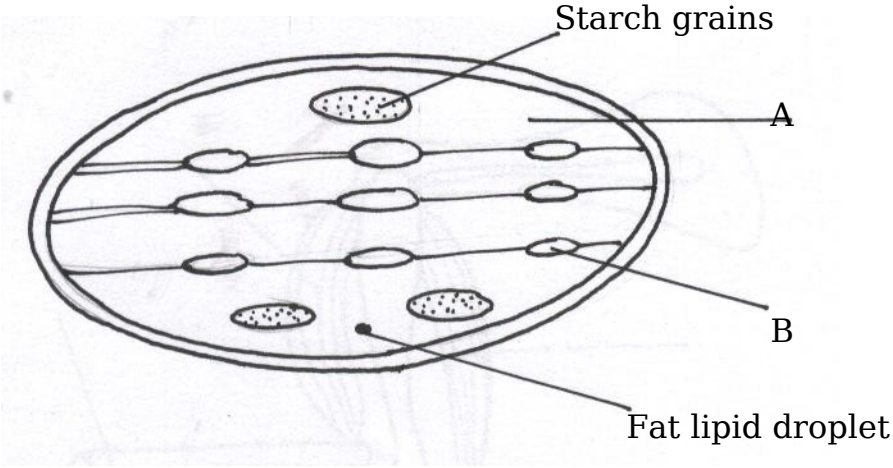
(b) Give the end product of anaerobic respiration in animals
(1mk)

(c) Name the chemical compound formed in the mitochondria which is the source of energy

(1mk)

(d) Explain why fats are considered as the main respiratory substrate yet they yield a lot of energy when completely oxidized
(2mks)

6. Study the diagram below and answer the question that follows



(a) Identify the structures labeled A and B

(2mks)

A……

B……

(b) What process takes place in the parts labeled

(2mks)

A……

B……

7. State the functions of the pulp cavity in a mammalian tooth

(2mks)

8. (a) Differentiate between transpiration and guttation
(2mks)

(b) State two conditions that are necessary for opening of the stomata
(2mks)

9. What are the functions of the dorsal aorta and the venacava
(2mks)

10. (a) Explain why tracheids are not efficient in transporting water up the plant (1mk)

(b) What is the advantage of xylem vessels being dead
(1mk)

11. Explain the effects of vigorous exercise on
(a) Breathing rate
(1mk)

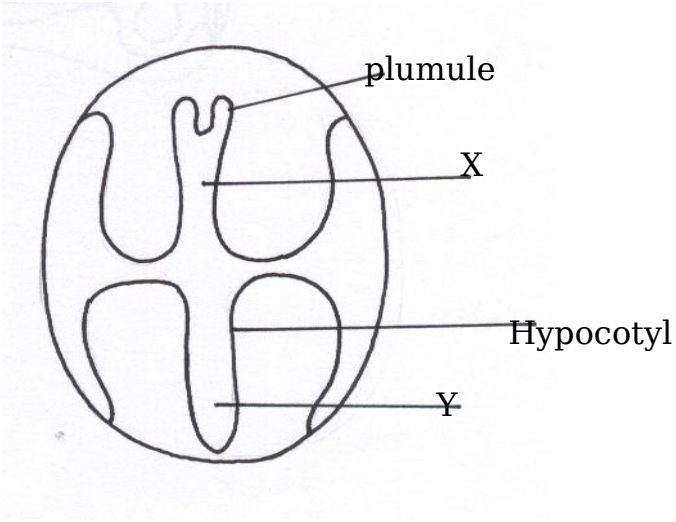
(b) Pulse rate

(1mk)

(c) Arterioles of a person

(1mk)

12. The diagram below represents the internal structure of a bean seed



(a) Name the parts of the seed embryo represented by letter X and Y (2mks)

X……

Y……

(b) What type of germination would result if the hypocotyl elongates faster (1mk)

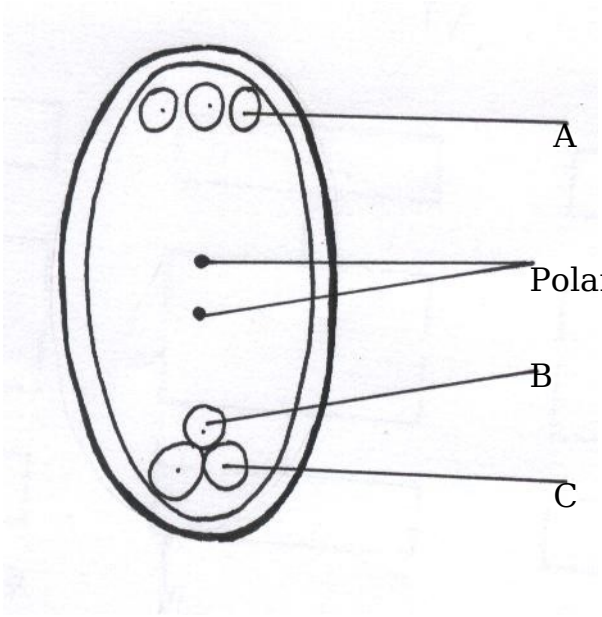
(c) What is the significance of the part labeled Y emerging first during germination (1mk)

13. (a) State two advantages which a constant body temperature gives mammals and birds over the animals
(2mks)

(b) How does body size affects heat loss in an animal
(1mk)

(c) How does sweating increase heat loss in mammals
(3mks)

14. (a) Study the diagram below and answer the questions that follows



Name the parts labeled A, B and C
(3mks)

A……

B……

C……

(b) What does the part B form after fertilization
(1mk)

15. What are the differences between male and female gametes of human beings (3mks)

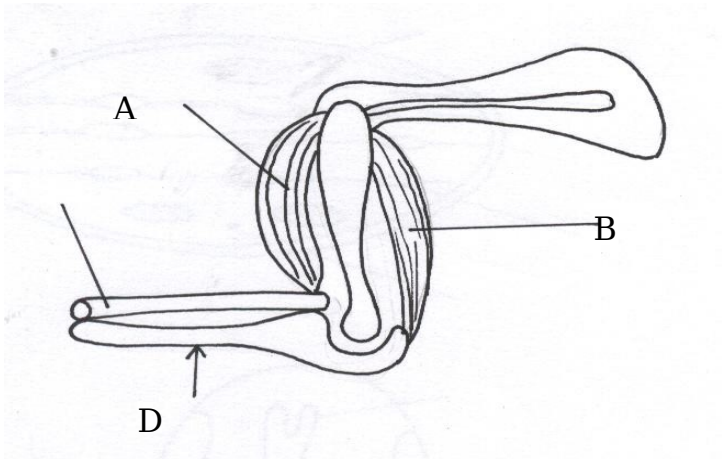
16. State three unique features of class insecta

(3mks)

17. What type of evolution is illustrated by the pentadacytl limb

(1mk)

18. Study the diagram below and answer the following questions



(a) Name the bones labeled C and D

(2mks)

(b) What happen to structure A and B as the arm is straightened

(1mk)

19. Define the following terms used in genetics

(a) Cloning

(1mk)

(b) Gene therapy

(1mk)

20. Name the blood vessel

(i) Bearing blood with less oxygen and at the lowest pressure

(1mk)

(ii) That link arterioles to venules

(1mk)

(iii) State two forms in which carbon (IV) oxide is transported in blood

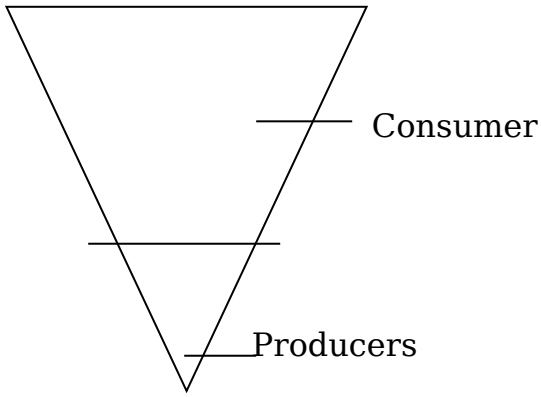
(2mks)

21. Explain what happens when the erector pili muscle of the skin contract

(3mks)

22. Give three differences nervous and hormonal communication
(3mks)

23. The diagram below represent a of bio mass derived from a certain ecosystem



(a) Suggest the type of ecosystem from which the was derived
(1mk)

(b) State the significance of short food chains in ecosystem
(1mk)

24. In an experiment some germination seeds were placed in a large air tight flask for four days

(a) What are the expected changes in composition of oxygen and carbon (IV) oxide (1mk)

(b) Give reason for your answer to (a) above
(3mks)

25. Name the hormone secreted by human placenta
(1mk)

26. The state of dormancy in which some animals go into during the dry season is called (1mk)

27. State the two economic importance of the plants in class dicotyledonae
(2mks)

Name……. **Index**

No……

School……

Signature……

Date……

231/1
BIOLOGY
PAPER 1
2 hrs

2012 PROJECTIONS -009
Kenya Certificate Of Secondary Education

INSTRUCTIONS
Answer ALL the Questions in this paper in the spaces provided.

FOR EXAMINER'S USE ONLY

QUESTIONS	MAXIMUM .SCORE	CANDIDIATES SCORE
1 - 33	80	

This paper consists of 8 printed pages. Candidates should check carefully to ascertain that all the pages are printed as indicated and no questions are missing.

1. a) State two functions of the centriole.
(1mk)

.....

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b) How is the aerenchyma tissue adapted to its functions?
(2mks)

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2. Name a characteristic in humans which is controlled by multiple alleles
(1mk)

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3. To which class does an animal with two body parts and four pairs of legs belong? (1mk)

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4. Explain why Xylem vessels do not collapse even when they do not contain water. (1mk)

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5. State two characteristics of cells found at the apical meristems.
(2 mk)

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6. What characteristics does the mouth cavity of a frog have in common with the lungs of a mammal that enable them to be efficient in gaseous exchange?
(3mks)

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7. Explain briefly how wind can affect the distribution and abundance of plants in a habitat (2mks)

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8. Explain what happens to excess fatty acids and glycerol in the body of humans. (2mks)

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9. List down three behavioral activities that organisms perform in condition of very low temperatures

(3mks)

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10. A student smeared Vaseline jelly on the lower epidermis of a leaf of a potted green plant which had been kept in the dark for 24 hours. She then transferred the plant to the light for six hours. Starch test on the leaf of the plants were negative. Account for the observation. (3mks)

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11. State three evidences of organic evolution
(3mk)

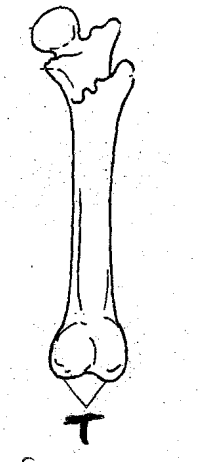
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12. The diagram below represents a bone obtained from the hind limb of goats.



a) Identify the bone?
(1mk)

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b) Name the type of joint formed at the part labeled T
(1mk)

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c) State the adaptation of sclerenchyma tissue for support in plants.
(1mk)

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13. Outline two structural differences between an egg and a sperm in humans.
(2mks)

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14. Give two reasons why blood pressure is greater in the arteries than in the veins of mammals.

(2mks)

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15. State two reasons why metamorphosis is important in the life of an insect.

(2mks)

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16. State the role played by the plug of mucus secreted by the ring of mucles of the cervix. (1mk)

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17. Explain the effect of increase in temperature on the rate of diffusion.

(2mks)

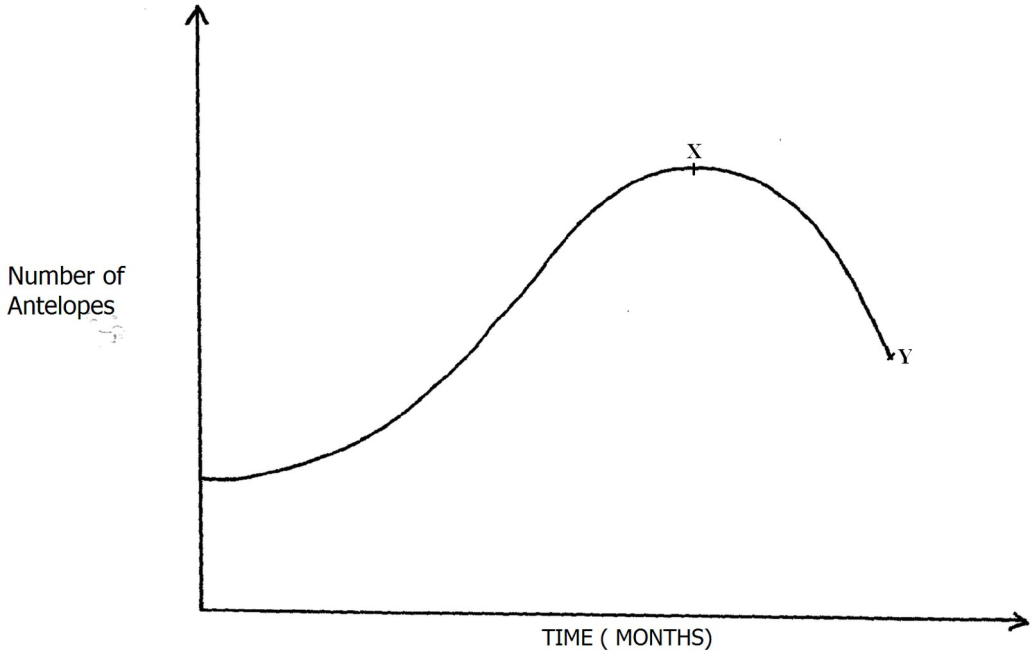
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18. The graph below represents the population growth of antelopes in Maasai Mara game reserve over a period of 12 months.



Suggest three factors that could have caused the population of antelopes to change between X and Y.

(3mks)

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19. Explain the changes which occur in the human eye when one moves into a darker room. (3mks)

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20. State the importance of polyploidy in plants

(3mks)

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21. State the importance of the following tropic responses in plants.

i) Phototropism:

(2mks)

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ii) Thigmotropism: (1mk)

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22. Nicotine is an excretory product in plants. State two economic importance of nicotine. (2mks)

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23. a) Name the respiratory surfaces in flowering plants through which gaseous exchange occurs.

(2mks)

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b) Name one adaptation of the guard cell to it's function.

(1mk)

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24. State the importance of synovial fluid present at the movable joints in mammalian skeleton.
(2mks)

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25. Explain how the following structural factors affect the rate of transpiration.

i) Hairs around the stomata:
(2mks)

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ii) More stomata on upper leaf surface than lower surface
(2mks)

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26. How is self pollination prevented in some flowering plants
(3mk)

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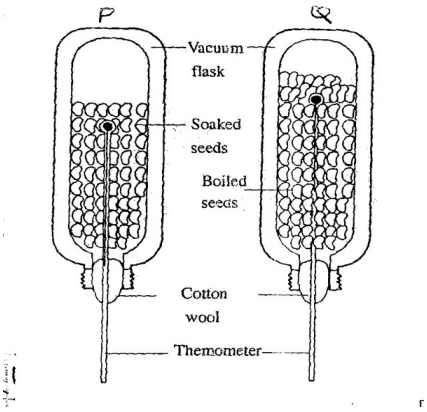
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27. List down three differences between monocotyledonae and dicotyledonae plants. (3mks)

Monocotyledonae	Dicotyledonae

28. Diagram below shows an experiment that was set up to investigate an aspect in germinating seeds. Study it carefully and answer the questions that follow.



a) State the aim of this experiment.
(1mk)

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b) Account for the observations made after 24 hours.
(3mks)

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c) Suggest why vacuum flasks were used in the experiment.
(1mk)

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29. Name the organelle in the cell involved in packaging of synthesized proteins.
(1mk)

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30. a) Name one nitrogenous waste product in animals.
(1mk)

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b) Explain why higher animals require an efficient excretory system.
(2mks)

31. State two roles played by osmosis in plants.
(2mks)

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32. Explain the meaning of the term survival for the fittest.
(2mks)

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33. State the organelle most abundant is cardiac muscles.
(1mk)

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END

NAME:……INDEX ……DATE……..

SCHOOL:……SIGNATURE……

231/1
BIOLOGY
PAPER 1
(Theory)
TIME: 2HOURS

2012 PROJECTIONS -010
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES.

- Write your name and index number in the space provided.
- Answer **ALL** the questions in this paper in the spaces provided.

For examiner's use only

Question	**Maximum**	**Candidate's score**
1-27	**80**	

1. (a) State the importance of a testcross in genetics
(1mk)

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(b) Name the four organic bases that are present in the RNA molecule.
(1mk)

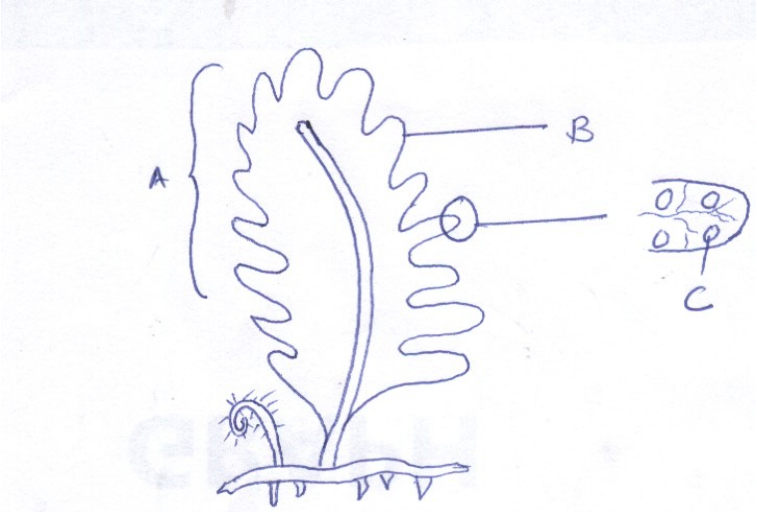
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2. The diagram below represents the sporophyte generation of a fern plant. Study it and answer the questions that follow.



a) Name the parts labeled A and B
(2mks)

A.....

B.....

b) Suggest the significance of the structure labeled C
(2mks)

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.....

3. Give an example of a sex linked trait in humans on

i. Y chromosome..... (1mk)

ii. X chromosome..... (1mk)

4. State two ways by which plants compensate for lack of ability to move from one place to another (2mks)

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5. Explain why a constant body temperature is maintained in mammals (3mks)

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6. Name two mechanisms that hinder fertilization in flowering plants. (2mks)

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7. State the functions of the following structures in a mammalian tooth. (2mks)

(a) Pulp cavity

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(b) Enamel

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8. (a) State three adaptations of plants which enables them reduce water loss. (3mks)

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(b) Suggest two factors that may lead to increased rate of transpiration.
(2mks)

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9. State the use of the following apparatus in collecting and observing organisms
   a) Pooter
      (1mk)
      .....

   b) Hand lens
      (1mk)
      .....

   c) Pitfall trap
      (1mk)
      .....

10. The diameter of the field of view was estimated to be 50mm under a certain magnification. Six cells were observed along the diameter of the field of view. What was the diameter of one cell in microns (μm)
(3mks)

11. What is meant by the following ecological terms.

a) Autecology (1mk)

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b) Synecology

(1mk)

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c) Habitat (1 mk)

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12. Explain the role of the following components of the skin when the temperature is high,

a) Sweat glands

(2mks)

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b) The Erector pili muscle

(2mks)

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c) Blood arterioles

(2mks)

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13. State the importance of the following processes to living organisms

a) Locomotion

(1mk)

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b) Irritability

(1mk)

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14. The diagram below represents a mature fruit of a certain plant.



a) State the agent dispersal for the fruit.

(1mk)

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

(1mk)

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c) State two other characteristics of fruit and seed dispersal by the agent named in (a) above

(2mks)

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15. State three adaptations of gills to their function.

(3mks)

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16. Give three differences between Nervous and Hormonal communication.

(3mk

Nervous	**Hormonal**

17. (a) What is organic evolution

(1mk)

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(b) Distinguish between divergent and convergent evolution.

(2mk)

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(c) Give one way in which Homo sapiens differ from Homo habilis.

(1mk)

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18. (a) State the function of olecranon process.

(2mks)

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(b) Which type of joint is found at the articulation of:

(i) Pelvic girdle and femur

(1mk)

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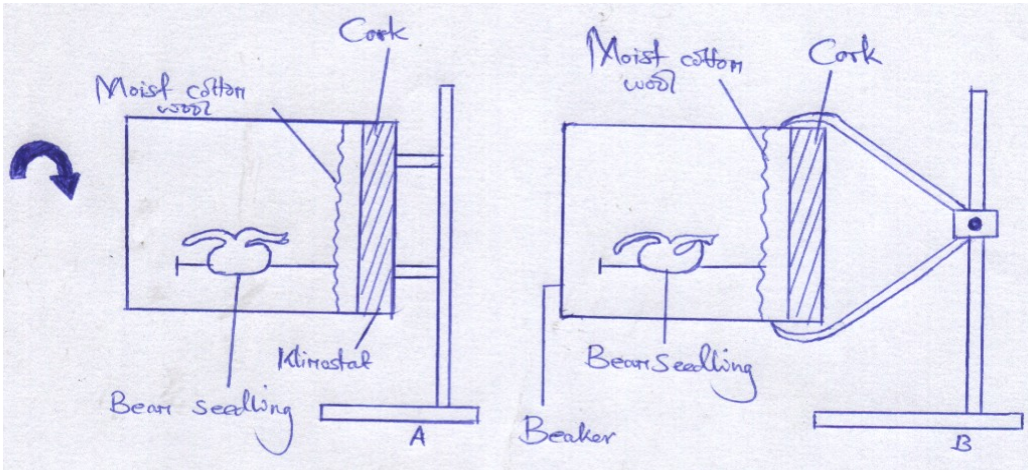
(ii) Humerus and ulna

(1mk)

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19. In an investigation, bean seedlings were set up as shown in the diagram below.



In set up A the klinostat was set in motion and the two set ups were left for three days.

a) What was the aim of the experiment?
(1mk)

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b) What observations were made in set up A and B.
(2mks)
Set A

.....

.....

Set B

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c) Account for the curvature of the radical in observations in set up B.
(1mk)

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20. (a) State three properties of a cell membrane.
(3mks)

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(b) Distinguish between Osmotic pressure and Osmotic potential.
(1mk)

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21. Give three main functions of water in a living organism.
(2mks)

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22. (a) (i) What is tissue fluid?
(2mks)

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(ii) State the importance of tissue fluid.
(1mk)

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(b) Name the blood vessel with the highest glucose.
(1mk)

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23. (a) State two functions of the cerebrum
(2mks)

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(b) What would happen if cerebellum was damaged?
(1mk)

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24. Ascaris lumbricoides is a parasitic roundworm which infects intestines of pigs and human beings. State two effects of the parasite on the host.
(2mks)

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25. How are leaves of submerged plants adapted to their functions? (2mks)

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26. What is meant by

(a) Natural immunity

(1mk)

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.....

(b) Acquired immunity

(1mk)

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.....

27. Name the class in the phylum arthropoda which has the largest number of individuals (1mk)

.....

NAME:……INDEX ……DATE……

SCHOOL:……SIGNATURE……

231/1
BIOLOGY
PAPER 1
2 HOURS

2012 PROJECTIONS -011
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES:

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- Answer **all** the question in the spaces provided above.

For Examiner's Use Only

Question	Maximum scores	Candidate scores
1- 24	80	

Answer all questions in this question paper in the spaces prided

1. a) What is meant by the term taxonomy?

(1mk)

……

……

b) When are two organisms considered to belong to the same species?

(2mks)

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2. State three activities of the cell that are controlled by the nucleus (3mks)

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3. Distinguish between haemolysis and plasmolysis. (2mks)

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4. State two adaptations of leaves that maximize efficiency in trapping sunlight for photosynthesis. (2mks)

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5. State two roles of hydrochloric acid in the digestion of food. (2mks)

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6. a) Name the blood vessels that link arterioles with venules (1mk)

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b) How are the blood vessels above suited to carry out their functions (2mks)

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7. Explain how the following adaptations will reduce the rate of respiration. (2mks)

a) Sunken stomata

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b) Leaf folding

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8. a) Name two structures for gaseous exchange in amphibians (2mks)

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.....

b) What is the effect of relaxation of diaphragm muscles during breathing in mammals.

(3mks)

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9. The equation below represents a process that occurs in plants.

$C_6H_{12}O_6 \longrightarrow$ [B] $+ C_2H_5OH +$ Energy

a) Name the process

(1mk)

.....

b) Name the product B

(1mk)

.....

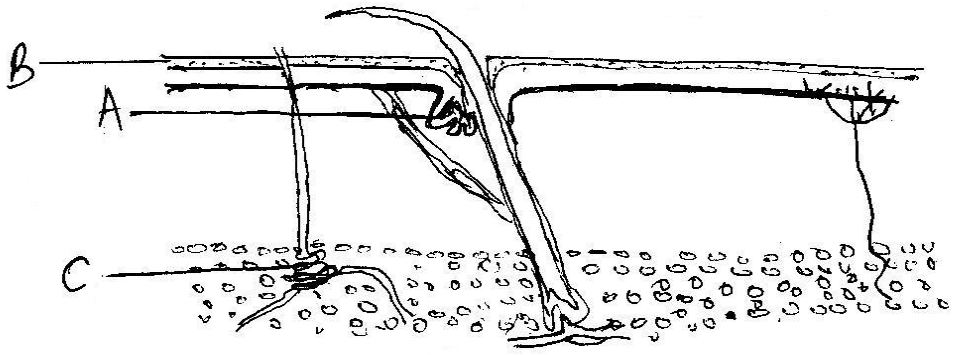
c) State the economic importance of this process

(2mks)

.....

.....

10. The diagram below represents a transverse section thro! human skin



a) Name the structure labelled;

(2mks)

A.....

B.....

b) State the function of part labelled C

(1mk)

C .....

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.....

.....

c) State **two** physiological changes that take place in a human skin in order to facilitate heat loss from the body.

(2mks)

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11. a) In what ways are fungal and plant cells similar.
(2mks)

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b) List **two** external features that distinguish members of class mammalian from other classes
(2mks)

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12. Name the disease caused by each of the following microorganism
(2mks)

a) Plasmodium falciparum

.....

b) Entamoeba histolytica

.....

13. State how excessive use of agrochemicals affects large water bodies.
(2mks)

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14. a) Distinguish between ecological niche and habitat.
(2mks)

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b) Explain why the ecosystem is said to be a self- sustaining natural unit. (2mks)

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15. a) Define the following terms in human reproduction. (2mks)

(i) Parturition.....

(ii) Implantation.....

b) Name the hormone involved in the development of a female secondary sexual characteristic. (1mks)

.....

.....

c) Give **one** function of amniotic fluid during pregnancy (1mk)

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16. a) State **two** factors within the seed that causes seed dormancy. (2mks)

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b) Distinguish between epigeal germination and hypogeal germination. (2mks)

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17. a) Define the following terms. (2mks)

i) Mutation.....

.....

ii) Discontinous variation .....

.....

.....

b) Haemophilia is more common in men than in women . Suggest reasons to account for this. (2mks)

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18. a) State **two** evidences of evolution.
(2mks)

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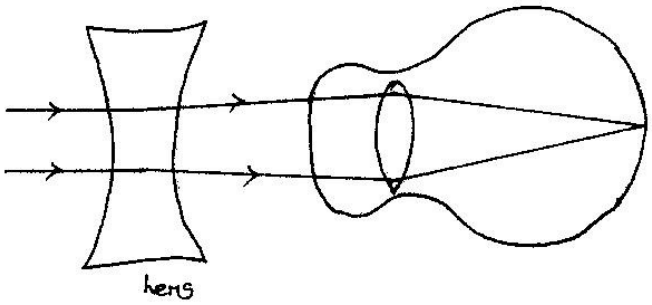
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b) Explain the concept adaptive radiation.
(2mks)

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19. The diagram below illustrates a certain eye defect



a) State the eye defect in the above diagram.
(1mk)

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b) i) State one cause of the above eye defect.
(1mk)

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ii) What role does the lens play in the correction of the above defect?
(2mks)

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20. Give **three** structural differences between the skeletal muscles and smooth muscles.
(3mks)

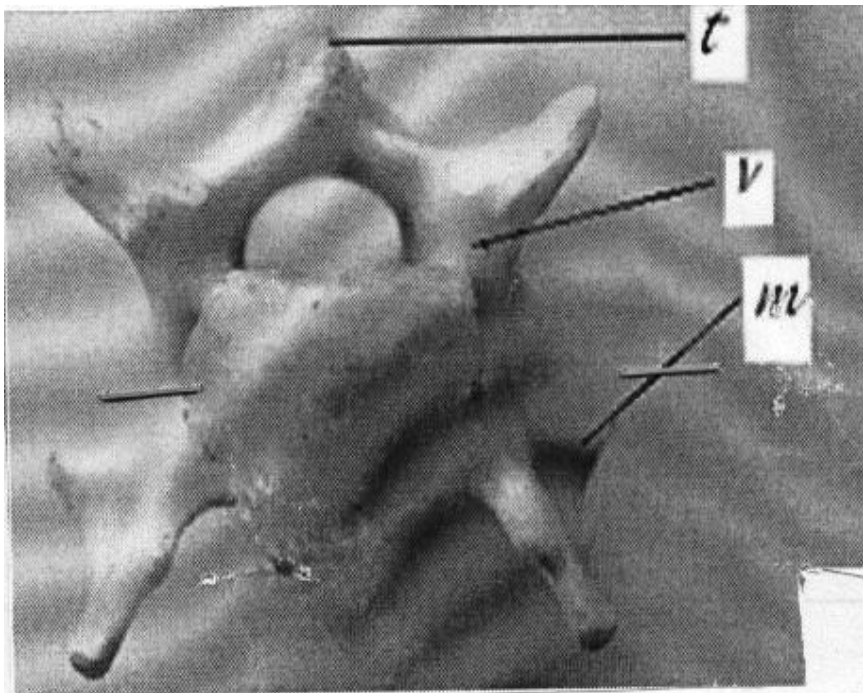
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21. The photograph below represent a bone obtained from a mammal.



a) Identify the bone
(1mk)

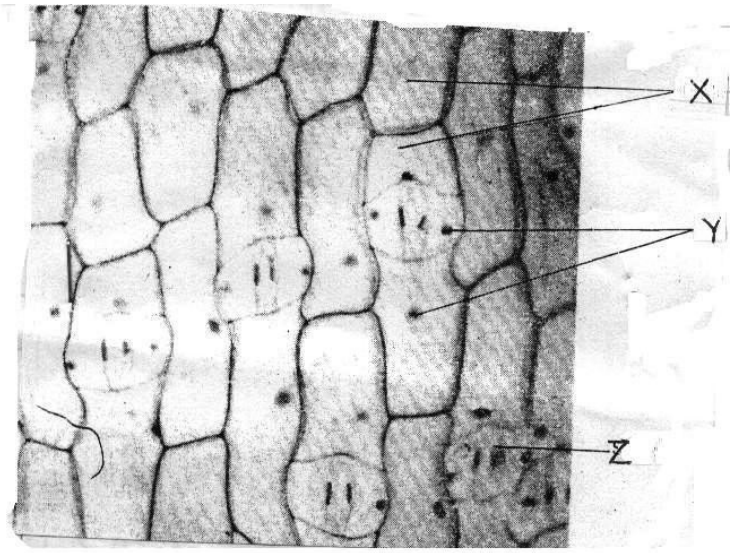
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b) Name the parts labelled;
(2mks)

t.....

m.....

22. Below is a photomicrograph of the surface view of the lower epidermis of a monocotyledonous leaf.



a) Name the cells labelled. (2mks)

X.....

Y.....

b) State **two** roles of part labelled Z in plants

(2mks)

.....

.....

23. State **three** structural adaptations of the proximal convoluted tubules to their functions.

(3mks)

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24. a) What is parthenocarpy.

(1mk)

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……

b) Which hormone can be used to induce parthenocarpy in unpollinated flowers (1mk)

……

……

c) What is the significance of slippery seeds in a tomato during dispersal? (1mk)

……

……

d) Why is a maize grain considered as a fruit? (1mk)

Name…… Index No……

School…… Candidate's sign……

Date……

231/1
BIOLOGY
PAPER 1
Time: 2 Hours

2012 PROJECTIONS -012
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

Answer ALL the questions.

FOR EXAMINERS USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE

1 – 27	80	

This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. Name the organelle that perform the following functions in a cell

   a) Destroy other cell organelles

   (1mk)

   .....

   .....

   b) Provide site for protein synthesis

   (1mk)

   .....

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2. Give two forms in which carbon (IV) oxide is transported in human blood

   (2mks)

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   .....

3. State **two** structural adaptations of the oviduct to its functions

   (2mks)

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4. The scientific name of roundworm is ascaris Lumbricoides

   i) Identify any two mistakes made in writing of the above name

   (2mks)

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ii) Name the scientific system of naming used above in (b)
(1mk)

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5. In an experiment to measure gaseous exchange between flying locust and its surrounding,

It was found that for every 1cm^3 of carbon (IV) oxide produced, 1.43cm^3 of oxygen was

consumed

i) Calculate the respiratory quotient for the food substance that was being oxidized (2mks)

ii) State the importance of respiratory quotient
(2mks)

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6. a) State the limitation of Lamarck's Theory of evolution
(1mk)

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b) Explain the term"struggle for existence" as used in evolution of species (2mks)

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7. The diagrams below shows two types of patterns of lignification in xylem vessels

Figure 1

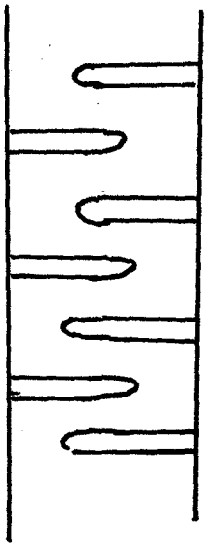
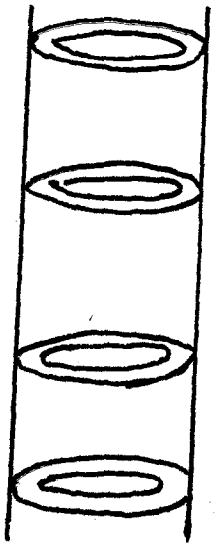


Figure 2



a) Name the pattern in

Figure 1.....

(1mk)

Figure 2.....

(1mk)

8. State two ways through which proteins are assimilated in the body (2mks)

.....

.....

.....

.....

9. Identify the phenomena described below in relation to pollination in flowers

i) The stigma matures before the anthers

(1mk)

.....

.....

ii) The male and the female parts of a plant are found on the same plant but at

different positions

(1mk)

.....

.....

10. Differentiate between O+ and O- blood group

(1mk)

.....

.....

.....

.....

11. With a relevant example, define vestigial structures

(2mks)

.....

.....

.....

.....

12. a) State two characteristics of meristematic cell s

(2mks)

.....

.....

.....

.....

b) Give a reason why oxygen is necessary in germination of seeds

(1mk)

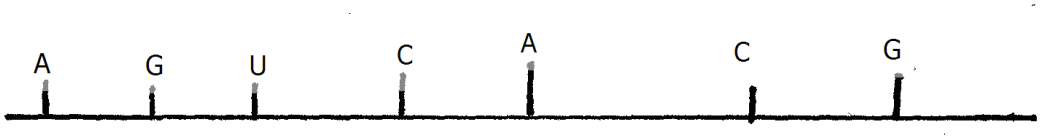
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13. Below is a nucleic acid strand



a) Name the nucleic acid

(1mk)

.....

.....

b) Give a reason for your answer in (a) above

(1mk)

.....

.....

c) Write down the complimentary base pairing the pattern in the nucleic acid that formed the

nucleic acid above

(1mk)

.....

.....

14. Differentiate between the following terms

a) Synecology (1mk)

.....

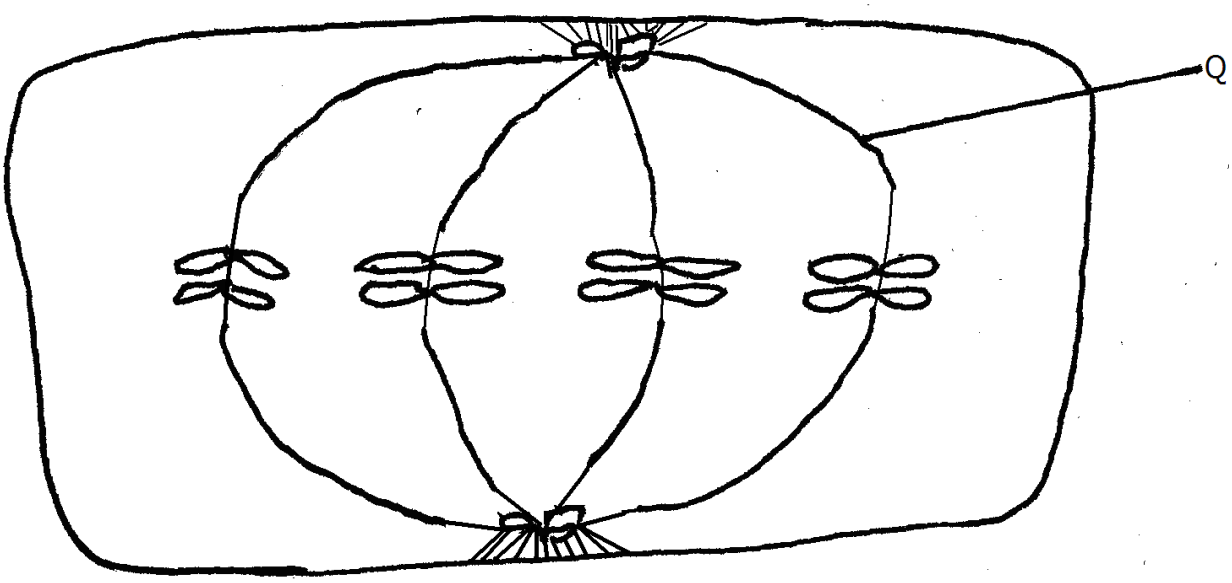
.....

b) Autecology (1mk)

.....

.....

15. The diagram below show a cell undergoing a stage in a cell division



a) Identify the stage (1mk)

.....

.....

b) Give a reason for your answer in a) above

(2mks)

.....

.....

c) What is the function of the part labeled Q

(1mk)

.....

.....

16. In an experiment it was found that when maggots are exposed to light they move to dark areas

a) Name the type of response exhibited by the maggots

(1mk)

.....

.....

b) Name the advantages of the response to the maggots

(2mks)

.....

.....

17. The table below shows percentage composition of blood plasma and urine from different

Substance

Substance	Blood plasma %	Urine %
Water	90	90
Plasma proteins	8	0
Glucose	0.2	0.1
Urea	0.03	2

a) Explain why;

i) There are no plasma proteins in the urine

(1mk)

.....

.....

ii) Urea concentration is greater in the urine than in the blood plasma

(1mk)

.....

.....

iii) There is glucose in the urine

(1mk)

.....

.....

18. State the functions of the following parts of the mammalian body

(3mks)

i) Cartilage

.....

.....

ii) Vertebral canal

.....

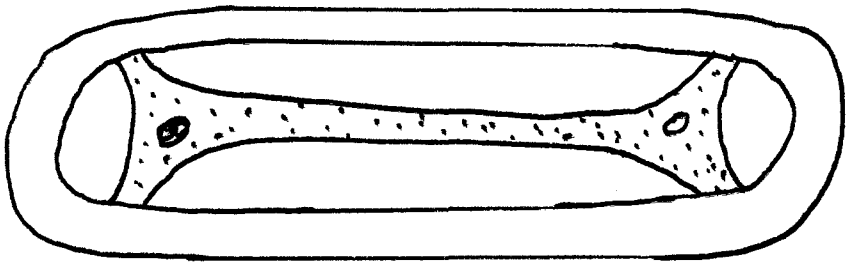
.....

iii) Cerebrospinal fluid

.....

.....

19. The diagram below shows a plant cell that has been placed in a certain solution



a) What term is used to describe the condition of the above cell
(1mk)

.....

.....

b) Account for the appearance of the cell shown above
(2mks)

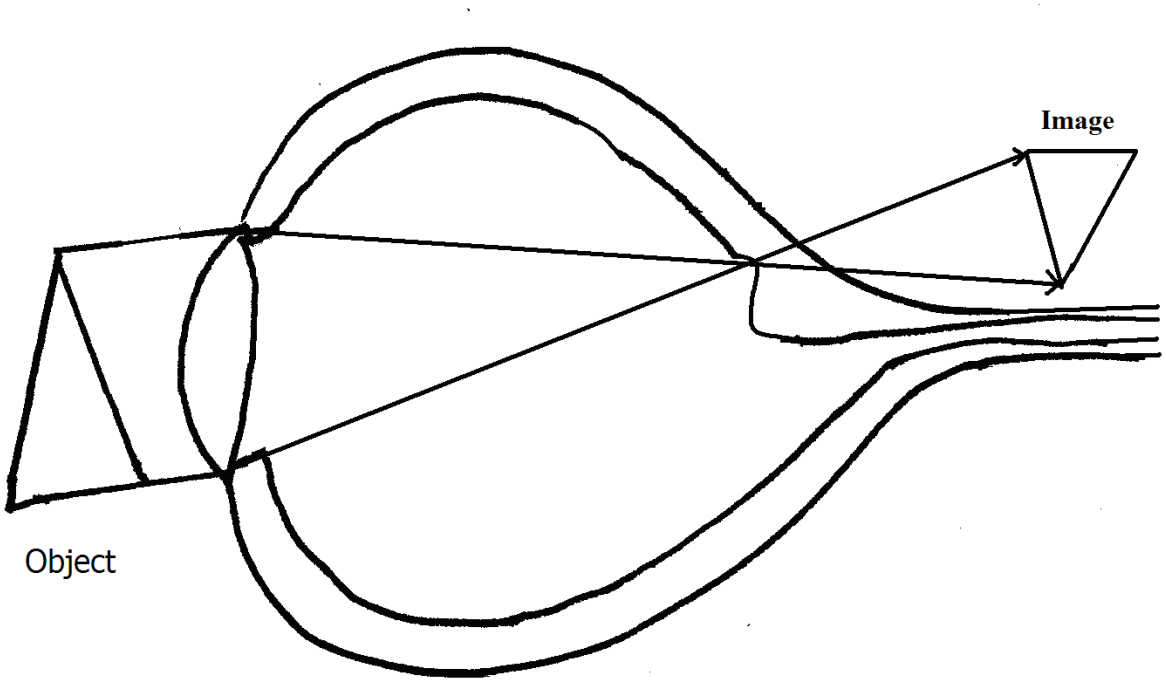
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20. The diagram below shows an eye defect



a) State the defect (1mk)

.....

.....

b) Draw a diagram to show how the defect can be corrected
(2mks)

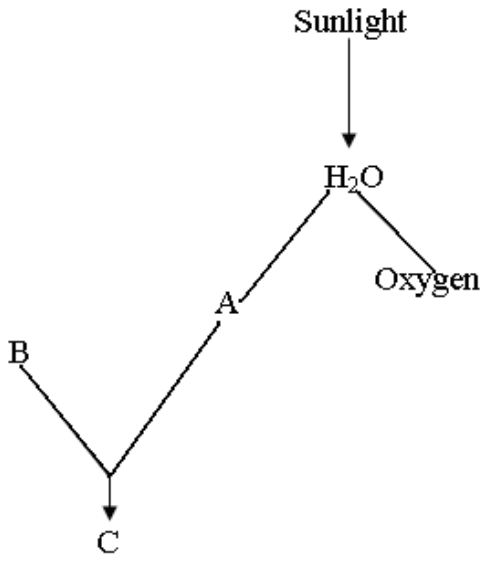
c) Identify the photochemical cell in the eye that posses a high visual acuity
(1mk)

.....

.....

21. The flow diagram below represents the process of photosynthesis. Study the diagram and answer

the questions that follow



a) Name the substances

(3mks)

A.....

B.....

C.....

b) Write an equation to show the process illustrated above

(1mk)

.....

.....

22. A traffic police stretched his arm to the light. To cause this motion of the arm, explain the

behaviour of his biceps and triceps
(2mks)

.....

.....

.....

.....

23. Explain why it is not possible to drown a locust while holding its head under water(2mks)

.....

.....

.....

.....

24. Name the main nitrogenous wastes excreted by
(3mks)

i) Birds.....

ii) Shark .....

iii) Cow.....

25. Name the organism that causes

i) Malaria (1mk)

.....

.....

ii) Gonorrhoea
(1mk)

.....

.....

26. List two adaptations of white blood cells to their functions
(2mks)

.....

.....

.....

.....

27. State the functions of the following structures of the human brain
(4mks)

i) Cerebrum

.....

.....

ii) Cerebellum

.....

.....

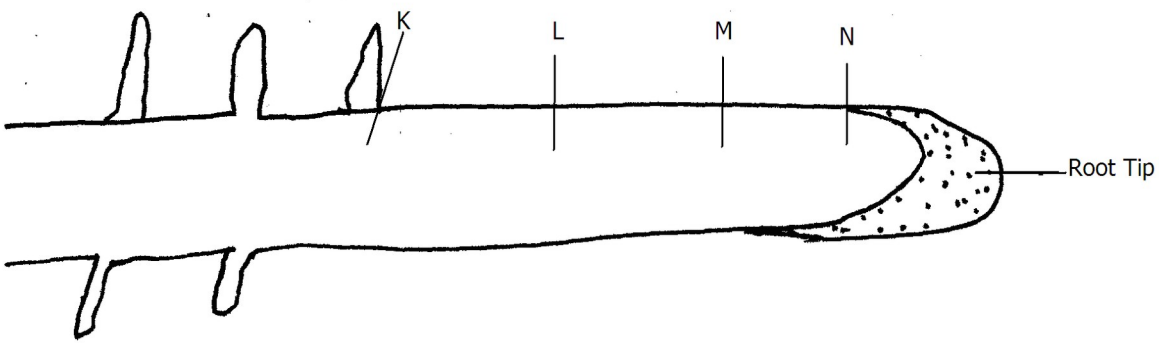
iii) Medulla oblongata

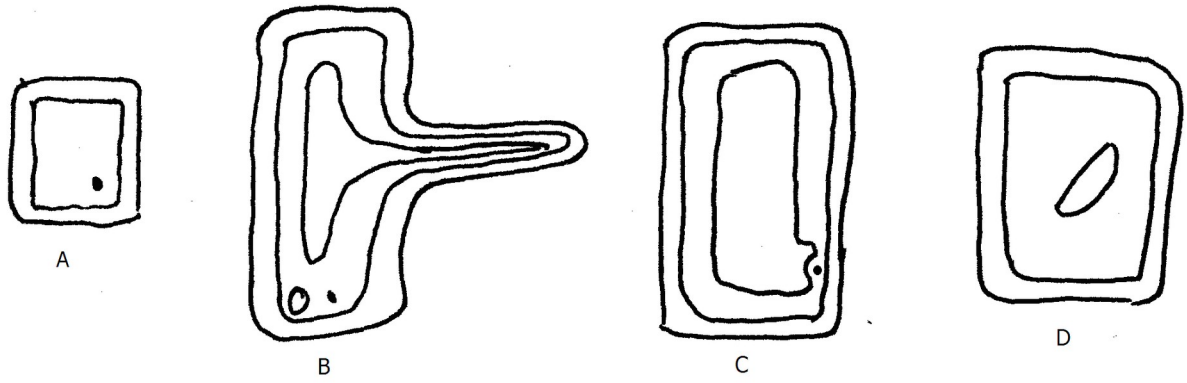
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28. The diagram below represent a young root and four cells which occur in different regions of the

root tip labeled K, L, M, N





State the regions of the root tip where each of the cells A B C D occur (4mks)

Cell	Region of root tip
A	
B	
C	
D	

29. a) Differentiate between resolving power and magnification power of a microscope (2mks)

.....

.....

.....

.....

b) State the function of the following parts of a microscope

i) Mirror

(1mk)

.....

.....

ii) Condenser (1mk)

.....

.....

NAME:……INDEX ……DATE……

SCHOOL:……SIGNATURE……

231/1
BIOLOGY
PAPER 1
2 HOURS

2012 PROJECTIONS -013
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES:

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- Answer **all** the question in the spaces provided above.

For Examiner's Use Only

Question	Maximum scores	Candidate scores
1- 26	80	

Answer all questions in this question paper in the spaces prided

1. Name the branch of biology that deals with the study of zooplanktons. (1 mark)

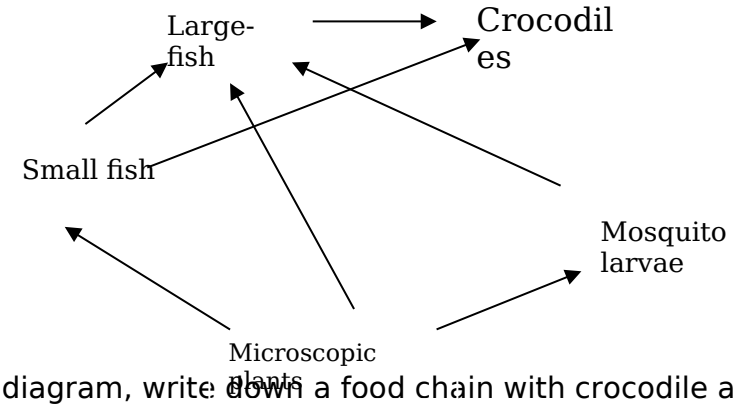
   ……

2. Name a cell structure responsible for the following functions in a cell.

   a) Mechanical support**.....** (1 mark)

   b) Site of synthesis of RNA**.....** (1mark)

3. The following diagram shows a feeding relationship in an ecosystem.



   a) From the diagram, write down a food chain with crocodile as the tertiary consumer.

   (1 mark)

   .....

   b) Which of the above organism would you expect to have the highest population?

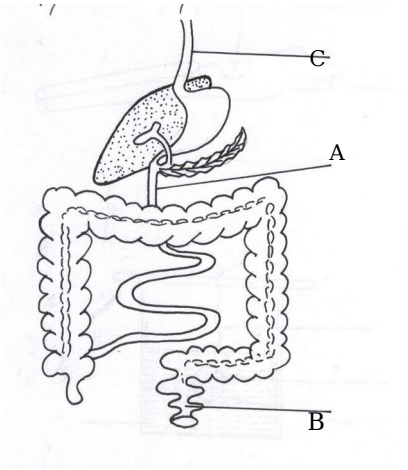
   (1 mark)

   .....

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

   .....

4. The diagram below shows part of alimentary canal of a mammal.



   (i)Name the parts labeled.

   A**.....** (1 mark)

   C**.....** (1 mark)

   (ii) State the function of the part labeled B. (1 mark)

   .....

5. a) Define accommodation of the eye. (1 mark)

.....

.....

b) State two causes of hypermetropia in humans. (1 mark)

.....

.....

6. a) What is meant by the terms

(i)Epigynous flower (1 mark)

.....

.....

(ii)Staminate flower (1mark)

.....

.....

.....

b) How are the male parts of wind pollinated flowers adapted to their functions? (2marks)

.....

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.....

7. a) Distinguish between homoiotherms and poikilotherms in homeostasis. (2 marks)

.....

.....

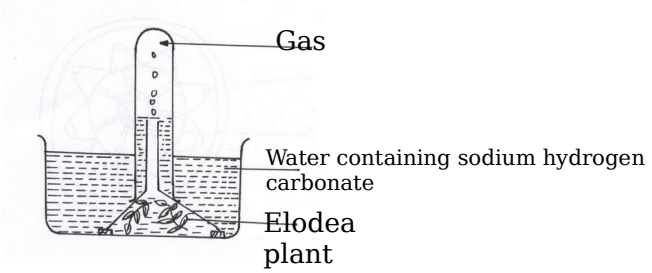
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b) Explain the significance of thermoregulation in living organism. (1mark)

.....

8. The experimental set-up shown below was placed outside for some days.



The rate of bubbles given off per unit time from the plant was measured. The results obtained are as shown below.

Days	weather	Average number of bubbles per minute
1	Cloudy and dull	4

2	Quite sunny	15
3	Bright sunshine	25
4	Less cloudy	8

a) Explain why the plant produces bubbles in the experiment above. (2marks)

.....

.....

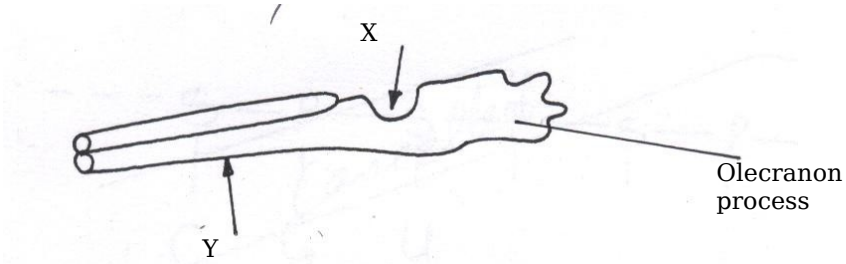
b) State the role of sodium carbonate in the set-up. (1 mark)

.....

c) What conclusion can be drawn from the results obtained in this experiment? (1 mark)

.....

9. The diagram below represents a bone found in humans



a) (i) Identify the bone..... (1 mark)

(ii) Name the part labeled X and Y. (2 marks)

X.....

Y.....

b) State the characteristic that is common to all cervical vertebrae but is absent in other vertebrae. (1mark)

.....

.....

10. a) Describe what happens to the intercostals muscles during inspiration in man. (2marks)

.....

.....

b) Explain how aquatic submerged plants are adapted to gaseous exchange. (1mark)

.....

11. The following key can be used to identify the five kingdom of classification.

1. a) Has nuclear membrane .....go to2

   b) Nuclear membrane absent..... Kingdom A

2. a) Body form made of hyphae..... Kingdom B

b) Body form without hyphae..... go to 3

3. a) Some unicellular, others multi-Cellular..... Kingdom C

b) All multi-cellular..... Go to 4

4. a) Feed autotrophically..... Kingdom D.

b) Feed hetrotrophically..... Kingdom E

a) Identify the kingdom.

(i) C..... (1 mark)

(ii) E..... (1 mark)

b) Apart from the characteristics mentioned in the key above, state two distinguishing features of Kingdom B. (2 marks)

.....

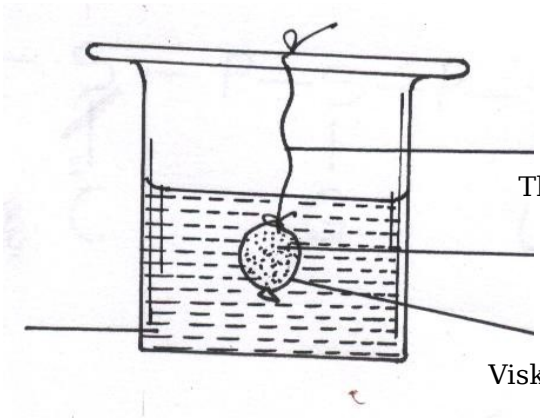
.....

12. a) Temperature affects the rate of osmosis. Explain. (2 marks)

.....

.....

b) An experiment was set-up as shown.



The set-up was left for 20 minutes.

i) State the expected results (1mark)

.....

ii) Explain your answer in (a) above. (3marks)

.....

.....

13. Explain Darwins theory of natural selection. (3marks)

.....

.....

.....

14. A blood transfusion was to be carried out to a patient who was badly injured in a road accident. His plasma contained antibody a.

a) Name two blood groups who would be donors. (2marks)

.....

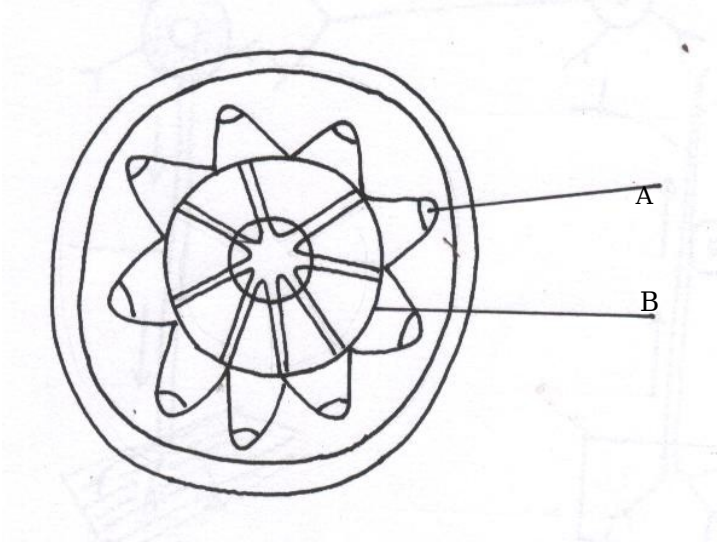
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b) Explain your answer in (a) above. (1mark)

.....

.....

15. The diagram below shows some growth in a plant.



a) Name the type of growth shown in the diagram. (1mark)

.....

b) Name the part labeled A.....` (1mark)

c) What is the function of the part labeled B (1mark)

.....

16. Give the function of each of the following parts of the ear.

a) (i) Ear ossicles..... ..... (1mark)

(ii)Tymphanic membrane..... (1mark)

b) Blowfly maggots (larvae) quickly burrow into decaying flesh as soon as they are exposed to light. Name this type of response. (1mark)

.....

17. Four organisms were classified using the binomial nomenclature as below.

Organism.	Name
V	Drosophila melanogaster
W	Canis lupus
X	Rana temporaria

Y Canis familiaris

a) Name two organisms that are closely related. (2marks)

.....

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

.....

18.a) Name the hormone responsible for ovulation in human females. (1marks)

.....

b) Give two roles of the placenta. (2marks)

.....

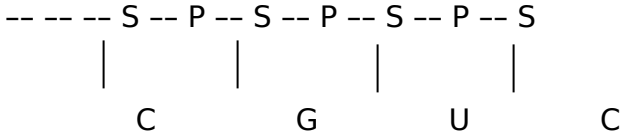
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19.Name the disease caused by:

a) Entamoeba histolytica..... .....(1mark)

b) Schistosoma mansoni ....(1mark)

20.The figure below is a structural diagram of a portion from nucleic acid strand



a) Giving a reason, name the nucleic acid to which the portion belongs.

Name.....

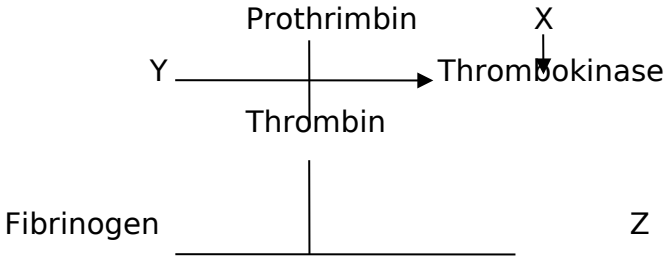
Reason..... (2 marks)

b) Write down the sequence of bases of a complimentary strand to that shown above.

(1 mark)

.....

21.The chart below is a summary of a blood clotting process.



a) Name the blood cell represented by X ..... (1 mark)

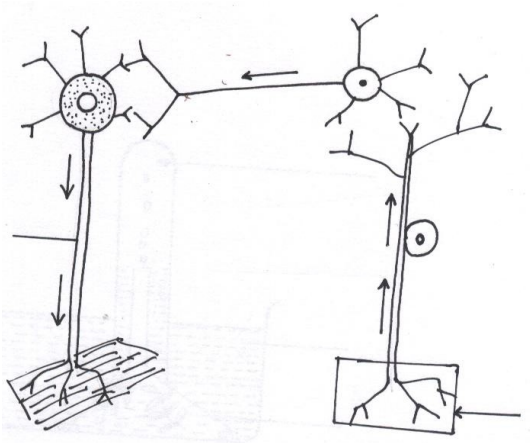
b) Name the metal ion represented by Y.....(1mark)

c) What is the biological importance of the blood clotting process (2marks)

.....

.....

22. The diagram below represents a reflex arc.



a) Name the parts labeled X and Y. (2marks)

X.....

Y.....

b) State two adaptations of X to its functions. (2marks)

.....

.....

23. State the role of the following bacteria in the Nitrogen cycle.

(i) Nitrosomonas..... (1mark)

(ii) Nitrobacter..... (1mark)

24. State the structures that adapt the fish for:

a) Forward movement.....

b) Fast movement..... (2marks)

25. State three adaptations of fruits and seeds to animal dispersal.

(i) .....

(ii) .....

(iii) ..... (3marks)

26. Suggest an explanation for the increased number of red blood cells found in the blood of people normally living at high altitude. (2marks)

.....

.....

27. What is the harm caused by skin lightening cosmetics. (2marks)

.....

.....

28. Other than root pressure, state two other forces involved in transportation of water and mineral salts. (2marks)

.....

.....

NAME: ……

ADM. NO: …… CLASS: ……

INDEX NO:……

231/1

BIOLOGY

PAPER 1

THEORY

TIME: 2HRS.

2012 PROJECTIONS -014
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

There are 28 questions printed. Answer **ALL** questions in the spaces provided.

FOR OFFICIAL USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1-28	80	

1. Name the cell organelles that are responsible for the formation of the following organelles. (3mks)

   i) Lysosomes_____

   ii) Cilia and flagella_____

   iii) Ribosomes_____

2. Name the blood vessels that:

   i) Supply blood to the heart muscles. (1mk)

   _____

   ii) Has the lowest concentration of urea. (1mk)

   _____

   iii) Has the highest concentration of glucose. (1mk)

   _____

3. Name **three** factors that would slow down enzyme activity. (3mks)

   (i)_____

   (ii)_____

   (iii)_____

4. State the importance of the following features in a respiratory surface. (2mks)

   i) Moist_____

   ii) Thin epithelium

   _____

   _____

5. a) State **two** functions of exoskeleton. (2mks)

   _____

_____

_____

_____

b) Name the material that strengthens both sclerenchyma and xylem. (1mk)

_____

6. Other than the stomata, name other **<u>two</u>** sites of gaseous exchange in terrestrial plants.

(2mks)

_____

_____

7. The oxidation of a certain food is represented by the chemical equation shown below:

$C_{57}H_{104}O_6 + 80\ O_2 \longrightarrow 57CO_2 + 52\ H_2O + Energy$

a) Calculate the respiratory quotient (RQ) of the food. (2mks)

b) Identify the food oxidized. (1mk)

8. State **<u>two</u>** structural differences between the glomeruli of a desert mammal and a fresh water fish. (2mks)

9. Explain how sweating brings cooling effect of the body. (2mks)

_____

_____

_____

_____

10. a) State **two** density dependent factors that affect population growth in an ecosystem. (2mks)

_____

_____

_____

b) Name the instruments used in measuring the following parameters in a habitat.

(2mks)

i) Light penetration

_____

ii) Wind speed.

_____

11. Distinguish between primary growth and secondary growth. (2mks)

_____

_____

_____

_____

12. a) What is natural selection? (1mk)

_____

_____

_____

b) Give **two** examples of natural selection in action seen today. (2mks)

_____

_____

_____

_____

13. The figure below represents an organism.



a) Name the phylum and class to which it belongs. (2mks)

Phylum: _____

Class: _____

b) State **two** observable features that are used to place the organism in the class in (a) above. (2mks)

_____

_____

_____

_____

14. a) A biologist found a new organism. Using a light microscope, state two structures that can be used to distinguish whether the organism was of plant or animal origin. (2mks)

_____

_____

_____

_____

b) Name the branch of biology that deals with the study of organisms that cause Malaria. (1mk)

_____

15. The table below shows the concentration of important plant nutrients.

Ion	Concentration in pond water (ppm)	Concentration in cell sap (ppm)
Potassium	200	50
Chloride	0.5	20

a) Name the processes by which the above ions could have been taken up by the plants. (2mks)

i) Potassium _____

ii) Chloride _____

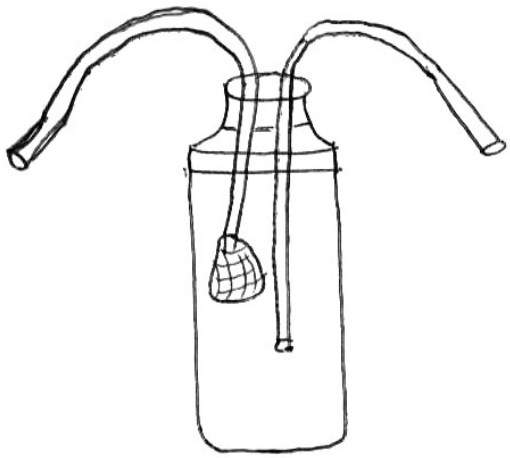
b) In terrestrial plants, flooding slows down uptake of certain minerals. From the table above, suggest with a reason the mineral whose uptake would be slowed down.
(2mks)

i) Mineral: _____

Reason _____

_____

16. The diagram below shows an apparatus used in biological study.



a) Name the apparatus shown above. (1mk)

_____

b) State its function. (1mk)

_____

_____

17. a) State the sites of the following stages of photosynthesis. (2mks)

i) Light Stage

_____

ii) Dark Stage

_____

b) Name **two** products of light stage that are used in the dark stage. (2mks)

_____

_____

19. a) Name a vitamin with the following deficiency symptoms: Night blindness, poor body growth, skin and eye diseases. (1mk)

_____

b) State the functions of the following mineral salts in the body.

i) Iodine (1mk)

_____

_____

ii) Sodium

_____

_____

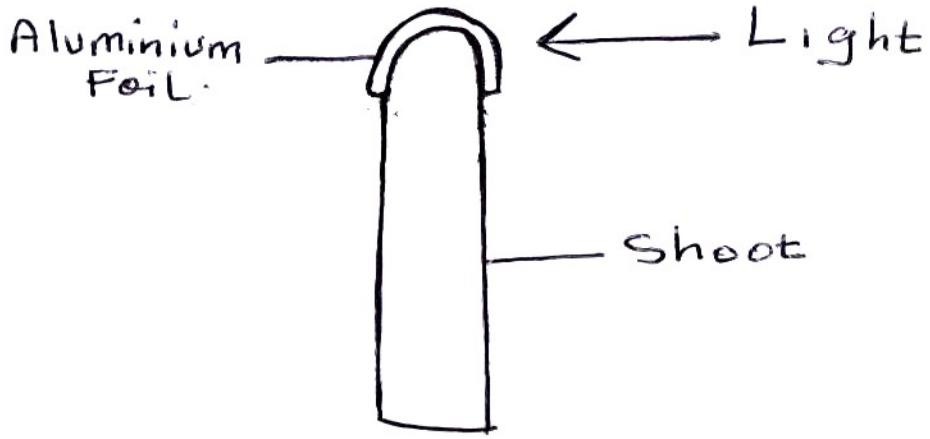
20. a) Name the condition in which both alleles expresses themselves equally. (1mk)

_____

b) Give an example of the above condition in humans. (1mk)

_____

21. Using the diagram below answer the questions that follow.



a) What would be the expected results after five days? (2mks)

_____

_____

b) State **one** adaptation which enables nocturnal animals to see fairly well at night.
(1mk)

22. Differentiate between hibernation and aestivation. (2mks)

_____

_____

_____

_____

23. a) Name the organisms found in root nodules of leguminous plants and their significance. (2mks)

Organism: _____

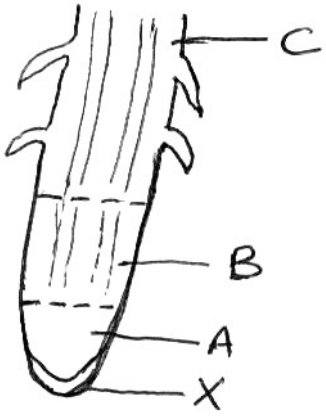
Significance: _____

_____

b) State the process by which nitrates in the soil are converted to atmospheric nitrogen. (1mk)

_____

24. The diagram below represents regions of a root tip.



a) State the functions of X. (1mk)

_____

b) Identify regions labelled A, B and C. (3mks)

A _____

B _____

C _____

25. State **three** effects of Cannabis sativa (Bhang) to human health. (3mks)

_____

_____

_____

_____

26. Name the part of the brain responsible for:- (3mks)

i) Maintaining balance of the body.

_____

ii) Thermoregulation and osmoregulation.

_____

iii) Sensation of pain, touch and sight.

_____

27. State **three** rules followed in scientific naming of organisms. (3mks)

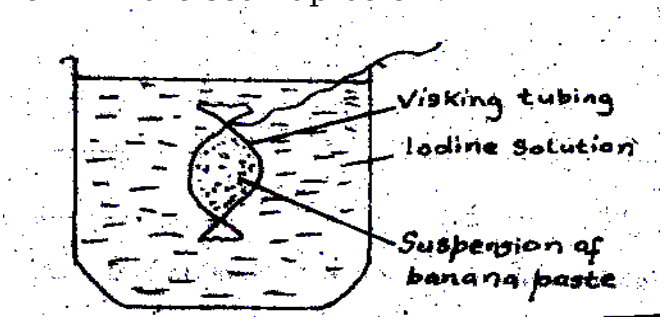
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_____

_____

28. In an investigation, raw banana was peeled, mashed into a paste and was treated as shown in the set – up below.



a) Name the physiological process being investigated. (1mk)

_____

_____

b) State the expected colour of the solutions inside and outside the visking tubing after 30 minutes. (2mks)

Inside

_____

Outside

_____

c) Explain the observation made in (b) above. (2mks)

_____

_____

_____

_____

NAME: _____

INDEX NUMBER_____

CANDIDATE'S SIGN _____

DATE: _____

231/1
BIOLOGY
PAPER 1
(THEORY)
2 HRS

2012 PROJECTIONS -015
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

a. Write your name and index number in the spaces provided
b. Sign and write the date of the examination in the spaces provided.
c. Answer ALL the questions.
d. Answers must be written in the spaces provided.

FOR EXAMINERS USE ONLY.

Questions	Maximum score	Candidates score
1 – 24	80	

Answer ALL questions in this section

1. Name the organelle that performs each of the following in a cell. (2 mks)
   (i) Proteins synthesis.

   _____

   (ii) Transport of all secretions.

   _____

2. Describe what happens during the light stage of photosynthesis. (3 mks)

   _____

   _____

   _____

   _____

   _____

3. (a) The scientific name of the housefly is Musca domestica
   (i) Identify the species name. (1 mk)

   _____

   (ii) The genus name. (1 mk)

   _____

   (b) Name the phylum whose members posses an exoskeleton. (1 mk)

4. How are leaves of submerged plants adapted to photosynthesis? (2 mks)

   _____

   _____

   _____

5. (a) What is meant by
   i. Autecology (1mk)

   _____

   _____

   ii. Synecology (1 mk)

   _____

   _____

   (b) The number and distribution of stomata on three different leaves are shown in the table below.

Leaf	Number of stomata	
	Upper epidermis	Lower epidermis
A	300	0
B	150	200
C	02	13

Suggest the possible habitat of the plants from which the leaves were obtained. (3 mks)

Leaf	Habitat
A	_____
B	_____
C	_____

(c) State the modifications found in the stomata of leaf C. (3 mks)

_____

_____

_____

_____

6. (a) What is the meaning of the following terms? (2 mks)

i. homeostasis

_____

_____

ii. osmoregulation

_____

_____

(b) Name the hormones involved in regulation of glucose level in the blood. (2 mks)

_____

_____

7. (a) State three characteristics of Mouera that are not found in other kingdoms. (3 mks)

_____

_____

_____

_____

(b) Name the class which the termite belongs. (1 mk)

8. In an investigation, plants with red flowers were closed with plants with white flowers.
   a. Give a reason for the appearance of pink flowers in the F1 generation. (1 mk)

_____

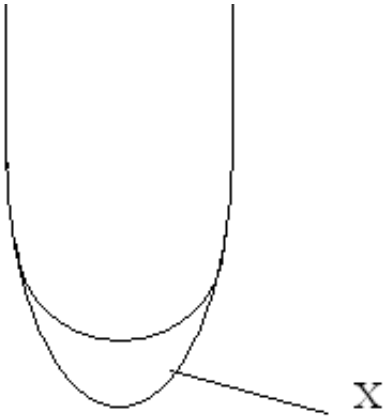
_____

   b. If the plants from the F1 generation were selfed, state the phenotypic ratio of the F2 generation. (2 mks)

_____

_____

9. The diagram below shows regions of a root tip.



   a. Name the two regions above X in ascending order. (2 mks)

_____

_____

_____

   b. State the function of the part labeled X

_____

_____

10. Distinguish between analogous and homologous structures. (2 mks)

_____

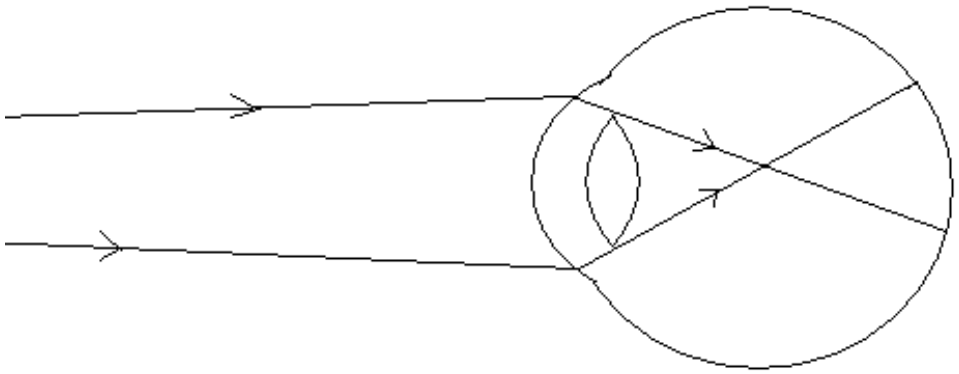
_____

_____

_____

_____

11. The diagram below shows the position of an image formed in defective eye.



a. Name the defect. (1 mk)

_____

_____

b. Explain how the defected named in (a) above can be corrected. (2 mks)

_____

_____

_____

_____

12. The equation below represents a process that occurs in the plants.

$C_6H_{12}O_6 \rightarrow B + C_2H_5OH + Energy$

(a)Name the process. (1 mk)

_____

_____

(b) Name the product B. (1 mk)

_____

_____

(c)State the economic importance of this process. (2mks)

_____

_____

_____

13. (a) State two processes which occur during anaphase of mitosis. (2 mks)

_____

_____

(b) What is the significance of meiosis? (2 mks)

_____

_____

14. (a) Explain how the following prevents self pollination.

i. Protandry. (1 mk)

_____

_____

ii. Self sterility. (1 mk)

_____

_____

(b) Give three advantages of cross pollination. (3 mks)

_____

_____

_____

_____

15. Explain how the following factors affect the rate of photosynthesis.

(a) Concentration of carbon (IV) dioxide. (1 mk)

_____

_____

(b) Light intensity. (1 mk)

_____

_____

16. (a) State three effects of dumping untreated sewage into a river. (3 mks)

_____

_____

_____

_____

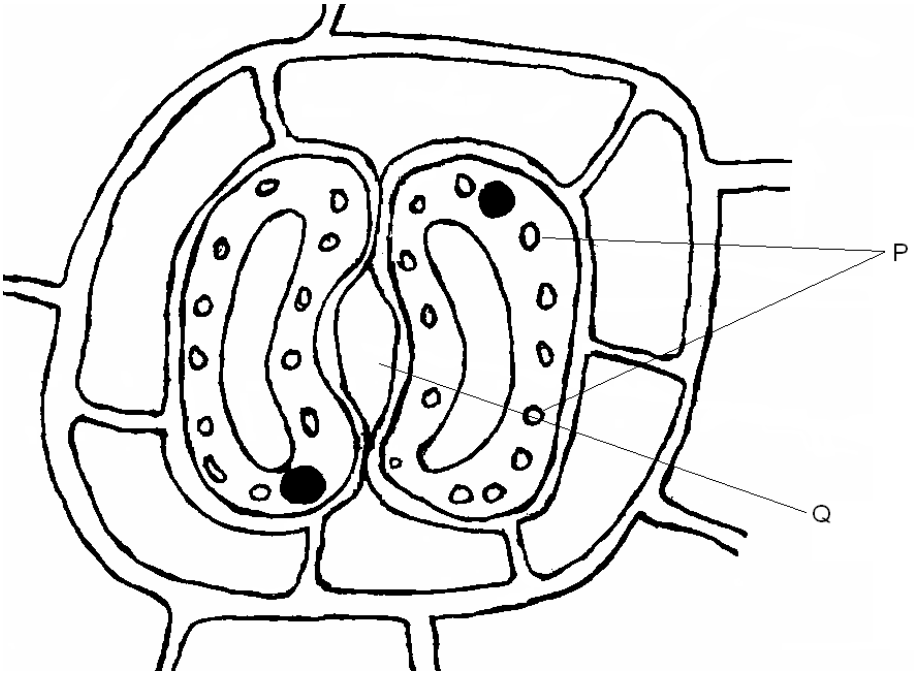
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(c) Name one process that is responsible for loss of energy from one trophic level to the next. (1 mk)

_____

_____

17. The diagram below represents a structure in plants.



(a)Name the parts labeled P and Q. (2 mks)

P - _____

Q - _____

(b) What are the roles of the parts labeled P and Q in plant nutrition? (2 mks)

_____

_____

_____

_____

18. (a) Distinguish between the terms homodent and heterodent. (1 mk)

_____

_____

(b) Explain how the carnassial teeth of a dog are adapted to their function. (2 mks)

_____

_____

(c) A certain animal has no incisors, no canines, 6 premolars and 6 molars in its upper jaw. In the lower jaw, there are 6 incisors, 2 canines, 6 premolars and 6 molars. Write its dental formula. (1 mk)

_____

_____

_____

19. Name the process by which

(i) Water is absorbed from lumen of mammalian colon into the blood stream. (1 mk)

_____

_____

(ii) Carbon (IV) Oxide gas leaves the capillaries and enters into the alveoli of the lungs. (1 mk)

_____

_____

20. (i) Write the type of gene mutation represented by the following analogue.

Intended message: BRING THERMOS ON OUTING (1 mk)
Actual message: BRING MOTHERS ON OUTING

_____

_____

(ii) Intended message: PLEASE SAY WHERE YOU ARE (1 mk)
PLEASE STAY WHERE YOU ARE

_____

_____

21. The equation below represents a metabolic process that occurs in the mammalian liver.

Amino acids → Organic Compounds + Urea.

a. Name the process. (1 mk)

_____

b. What is the importance of the process to the mammal? (1 mk)

_____

_____

c. What is the source of amino acids in this process? (1 mk)

_____

d. What is the difference between essential and non-essential amino acids? (1 mk)

_____

_____

22. (a) What is given to response to contact with surface exhibited by tendrils and climbing stems in plants? (1 mk)

_____

_____

(b) State three biological importances of tropisms to plants. (3 mks)

_____

_____

_____

_____

23. A person was found to pass out large volumes of dilute urine frequently.

a. Name the disease the person was suffering from. (1 mk)

_____

_____

b. The hormone that was deficient. (1mk)

_____

_____

24. Explain the continental drift as an evidence of evolution. (3 mks)

_____

_____

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END

Name……. **Index No.** …….

School …….. **Date**……. …….

Sign……. …….

231/1
BIOLOGY
PAPER 1
Time: 2 Hours

2012 PROJECTIONS -016
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

- Answer ALL the question.

FOR EXAMINERS USE ONLY

QUESTION	Max Score	Candidate Score
1 – 27	80	

This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. State the function of the following organelles

   i) Nucleolus (1mk)

   .....

.....

   .....

   .....

   ii) Centrioles (2mks)

   .....

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   .....

   .....

2. What is the importance of ecdysis in insects

   (2mks)

   .....

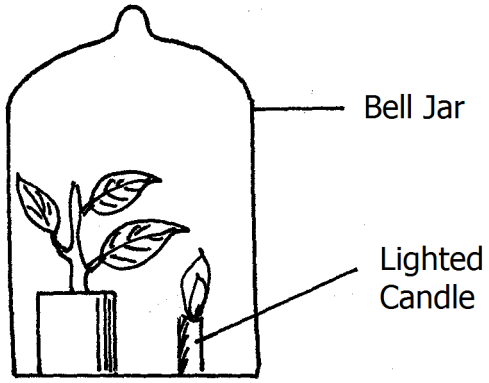
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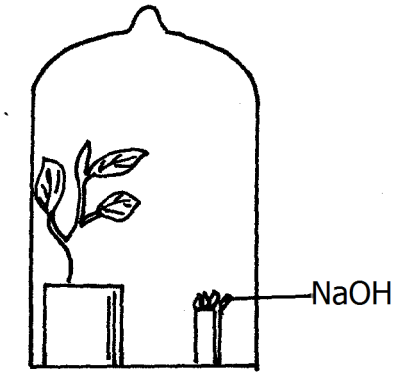
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   .....

3. Two potted plants A and B were placed in the dark for two days. Each was then placed in an air

   tight bell jar as follows then transferred to light for four hours. Each plant was then tested for starch.





a) Why were the plants put in a dark place for two days
(1mk)

.....
.....

.....

.....

b) What was the result of the starch test in plant B. Explain your answer
(3mks)

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4. In an ecological study students captured 260 grasshoppers in a school compound, marked and released them. After 24 hours they captured 193 grasshoppers out of which 72 had
been marked.

a) Identify the population estimation method the students were using
(1mk)

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.....

b) Calculate the population of grasshoppers on the school compound
(3mks)

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5. Explain how carboxyhaemoglobin leads to death
(3mks)

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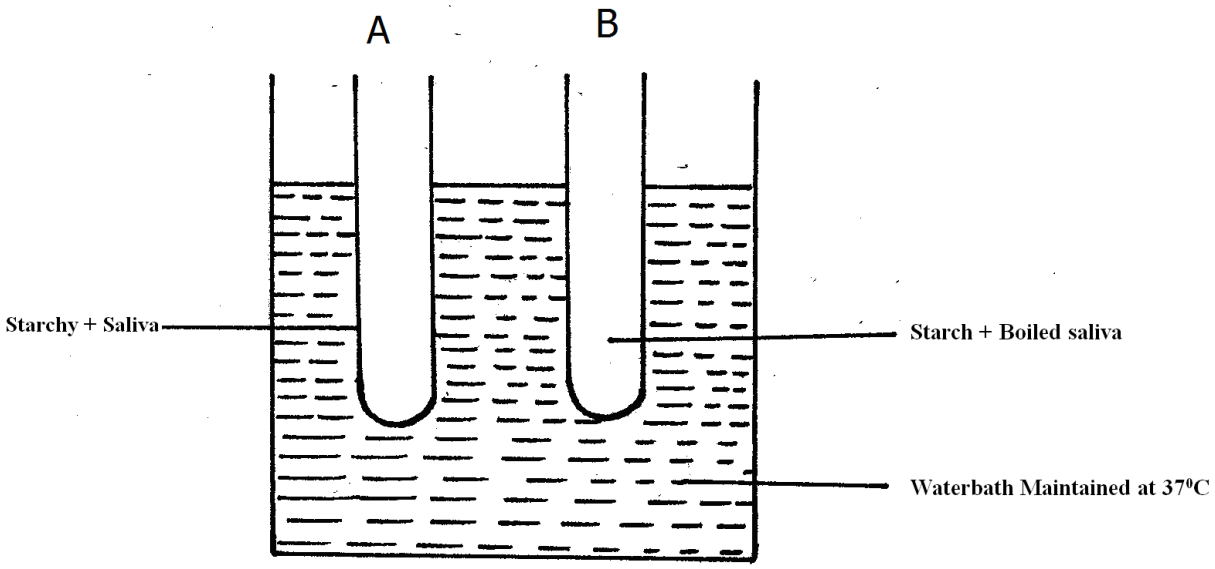
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6. In an experiment to investigate an aspect of digestion; two test tubes A and B were set up as
shown in the diagram below.



After 30 minutes the content of each test tube was tested for starch using iodine solution.

a) What results were expected in test tube A and B

(2mks)

A……

B……

b) Account for the results you have given in (a) above in test tube A

(2mks)

……

……

……

……

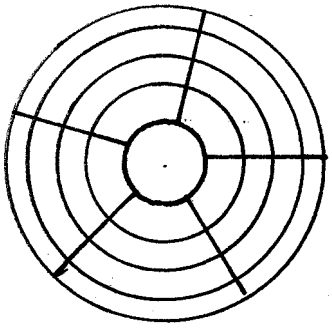
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7. The diagram below shows the front view of the mammalian eye.



i) Draw the change that would appear when a person moves from a brightly lit area to a

dimly lit area

(1mk)

ii) Explain what causes this change (2mks)

.....

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8. Identify **two** adaptations of vertebrate neurone that affects the speed of impulse transmission (2mks)

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9. Name **two** vaccines given to a baby immediately after birth
(2mks)

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10. Suggest **three** ways of reducing global warming
(3mks)

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11. State **three** differences between anthers of insect pollinated and wind pollinated

Flowers (3mks)

.....

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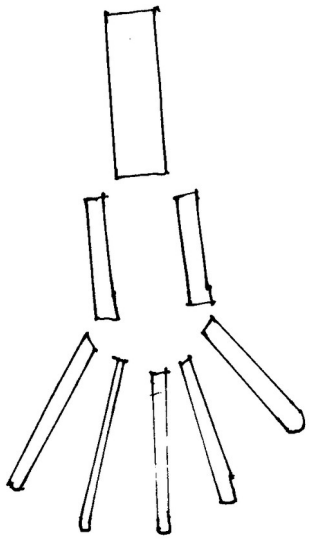
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12. Bellow is a diagrammatic representation of a vertebrate fore limb.



a) What is the limb known as? (1mk)

.....

.....

.....

.....

b) Identify **three** different types of locomotion that the limb has been modified to

perform. (3mks)

.....

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.....

13. Name the gaseous exchange structures in the following parts of a plant (3mks)

i) Stem.....

ii) Root.....

iii) Leaf.....

14. Complete the table below by identifying each of the bones described on the left column and filling

in on the right. (4mks)

Description	Bone
Has odontold process	
Lacks centrum and has wing like transverse process	
Has longest transverse process	
Articulates with sigmoid notch at its distal end	

15. State the importance of each of the following in the human reproductive system (3mks)

a) Epididymis……

b) Oviducts……

c) Prostate gland……

16. a) Name **two** divisions in the kingdom Plantae that show alternation of generation

……

……

……

b) Name the phylum whose members possesses a notochord (1mk)

……

……

……

17. State **three** benefits of polyploidy to a farmer. (3mks)

……

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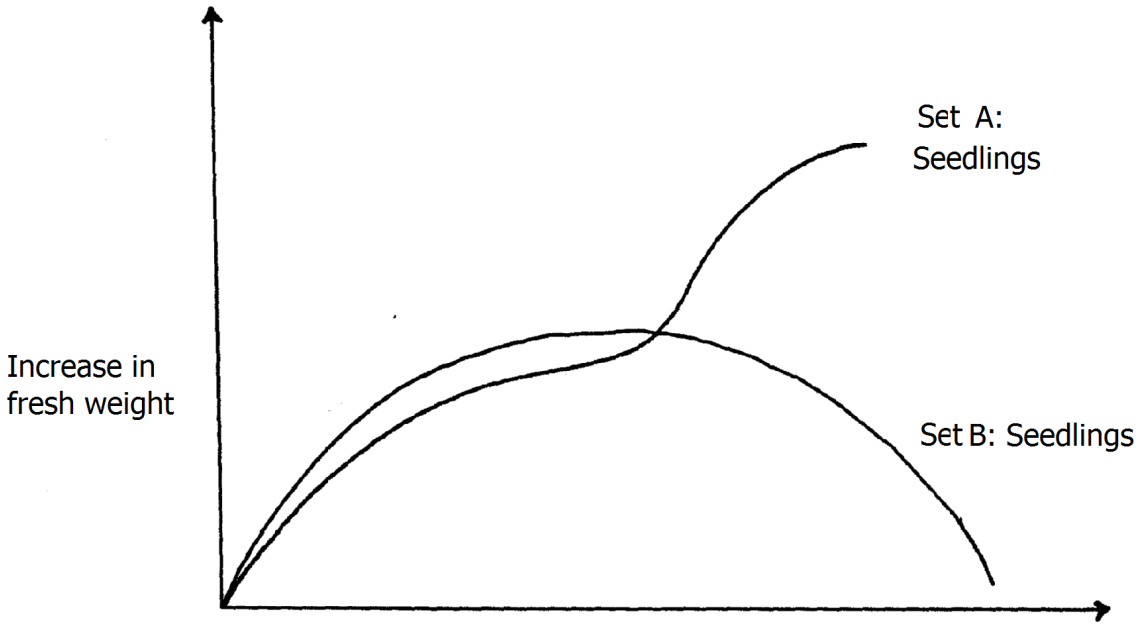
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18. Two sets of seeds A and B were germinated for 4 days set A was placed in light and set B in

darkness. The seedlings were then dried and weighed. The results were represented in

a graph as shown below



Explain the differences observed in both the set of seedlings

(4mks)

Set

A:……

……

……

……

……

……

Set B:……

……

……

……

.....

.....

19. List the changes that take place during inhalation in the breathing cycle of a mammal

in the following parts (3mks)

i) Ribcage

.....

.....

.....

.....

ii) Diaphragm

.....

.....

.....

.....

iii) Intercostal muscles

.....

.....

.....

.....

20. a) What is meant by the term variation as is used in genetics (1mk)

.....

.....

.....

.....

b) State **two** differences between continous and discontinous variation (2mks)

.....

.....

.....

.....

21. a) State any **two** structural factors that affect rate of transpiration in plant leaves. (2mks)

.....

.....

.....

.....

b) Give **two** importance of transpirations in plants
(2mks)

.....

.....

.....

.....

22. a) Name the building blocks of

i) Protein
(1mk)

.....

.....

.....

.....

ii) Lipids
(1mk)

.....

.....

.....

.....

b) List two factors that affect the rate of enzyme action
(2mks)

.....

.....

.....

.....

23. Name any two functions of cerebellum in human brain.
(2mks)

.....

.....

.....

.....

24. State **two** characteristics of Kingdom Plantae
(2mks)

.....

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.....

.....

25. The diagram below represents an experiment that was set up to investigate a Certain process.

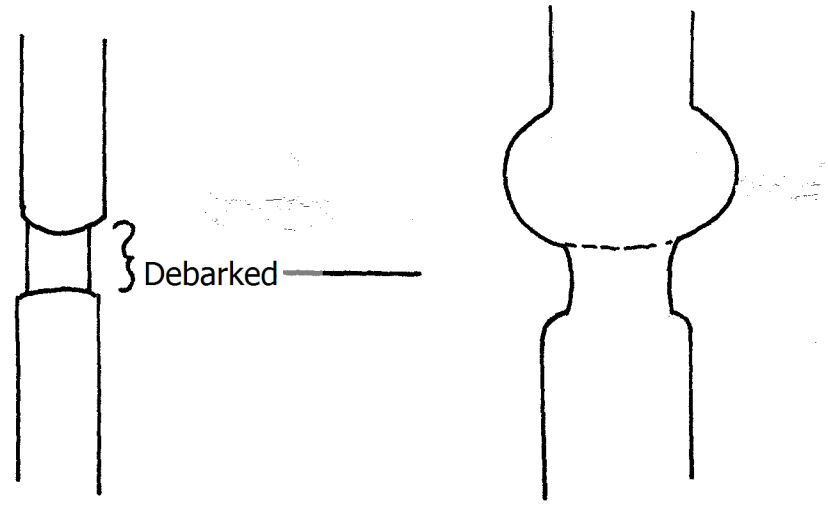


Diagram 1 Diagram 2

a) Name the process that was being investigated (1mk)

.....

.....

.....

b) Account for the swelling in diagram 2 (2mks)

.....

.....

.....

.....

26. Explain why the heart beat and rate of breathing increases during vigorous exercise (2mks)

.....

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.....

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.....

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.....

.....

27. Give the sequence of mRNA that would complement the following DNA molecule (1mk)

Sequence C – G – G – A – T – C – T – A

Mrna

Name…… Index No……

School…… Candidate's sign……

Date……

231/1
BIOLOGY
PAPER 1
Time: 2 Hours

2012 PROJECTIONS -017
Kenya Certificate Of Secondary Education
INSTRUCTIONS TO CANDIDATES

1. Answer ALL the question.
2. This paper consists of 32 questions

FOR EXAMINERS USE ONLY

QUESTION	Max Score	Candidate's Score
1 – 32	80	

This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated

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and no questions are missing.

1. Give the functions of the following parts of a microscope.
(2mks)

i) Condenser

.....

.....

.....

ii) Fine adjustment knob

.....

.....

.....

2. A dog weighing 15.2 kg requires 216 kJ while a mouse weighing 50g required 2736kJ per day. Explain
(2mks)

.....

.....

.....

3. a) Name the disease caused by H.I.V
(1mk)

.....

.....

.....

b) Give two reasons why it is difficult to cure the disease named above.
(2mks)

.....

.....

.....

c) Give <u>one</u> preventive measure of the named disease.
(1mk)

.....

.....

.....

4. State the function of each of the following parts of human ear.
(4mks)

a) Ear ossicles

.....

.....

b) Cochlea

.....

.....

c) Semi – circular canal

.....

.....

d) Eustachian tube

.....

.....

5. State two protective functions of the placenta.
(2mks)

.....

.....

.....

6. Why is oxygen important in the process of active transport.
(1mk)

.....

.....

.....

7. How are leaves of submerged plants adapted for photosynthesis.
(3mks)

.....

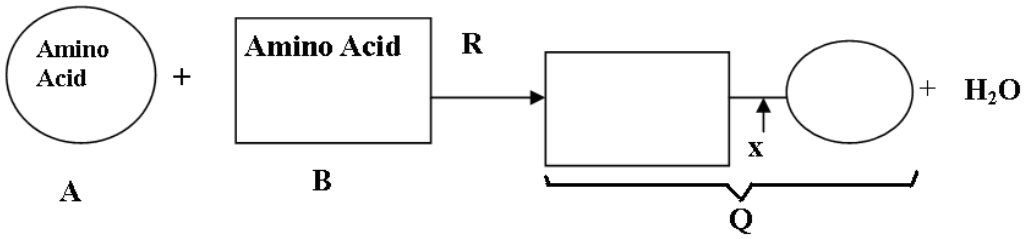
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8. The following is a diagrammatic representation of protein synthesis. Study it and answer the questions that follow.



a) Name the process R.
(1mk)

.....

b) Where in the cell does R takes place.
(1mk)

.....

c) Name the:

i) Product Q (1mk)

.....

ii) Part X
(1mk)

.....

9. a) An individual has blood group A.

List the possible genotypes.

(1mk)

.....

b) What is the significance of a test cross.

(1mk)

.....

10. a) What is the function of the following structures.

i) Spiracles. (1mk)

.....

ii) Tracheoles. (1mk)

.....

b) Name the substance that strengthen the trachea in insects.

(1mk)

.....

11. Suggest two functions of the mucus secreted along the walls of the alimentary canal (2mks)

.....

.....

.....

12. Distinguish between divergent and convergent evolution. Give example in each case. (2mks)

.....

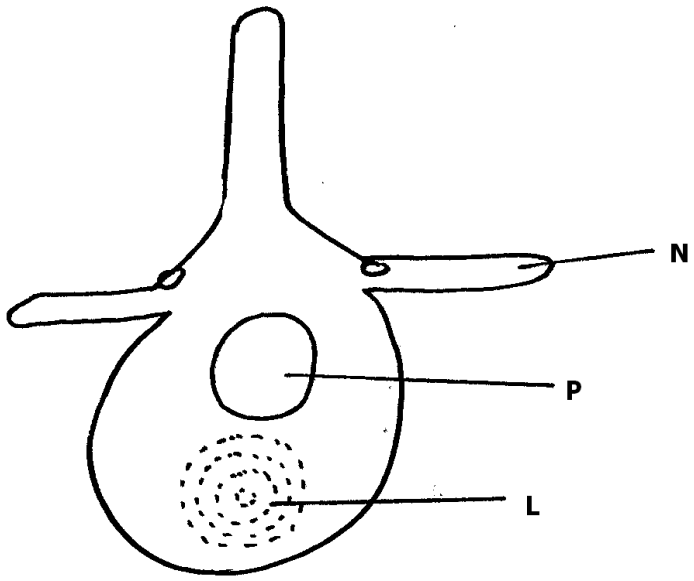
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13. The diagram below represents the anterior view of a typical vertebra bone. Study it and answer the questions that follow.



a) Name the parts shown as N, P and L
(3mks)

N
.....

P
.....

L
.....

b) State the function of the part shown as P.
(1mk)
.....

14. Give two defects in human that a rise as a result of Chrosomal mutation.
(2mks)
.....
.....
.....

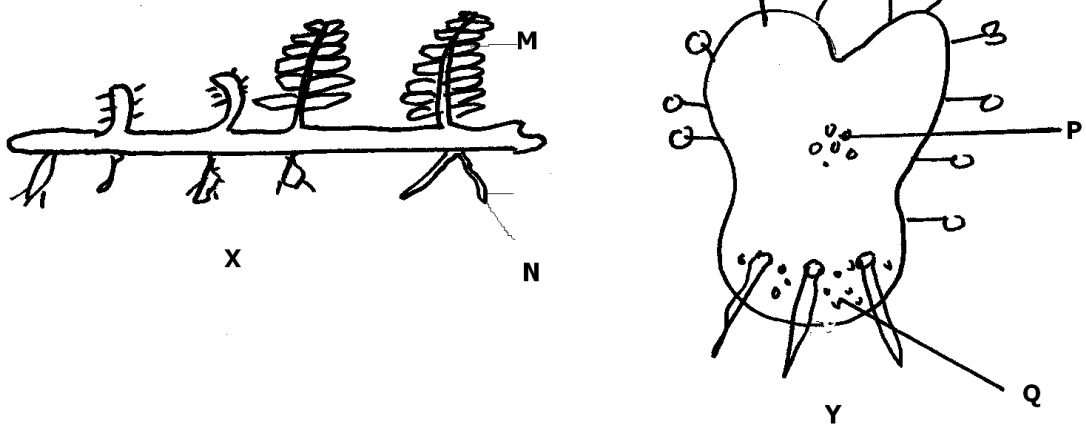
15. During an ecological study, the following organisms were found.

20	algae
50	insect larvae
10	small fish
5	large fish

a) Using an appropriate scale construct a of number of the organisms.
(3mks)

b) Suggest a name for the figure drawn above.
(1mk)
……

16. Study the organism below and answer the question that follow.



The diagram X and Y represents two stages in the life cycle of an organism

a) Identify the organism.

(1mk)

.....

b) Name the stages X and Y.

(2mks)

.....

.....

.....

c) State one function of N.

(1mk)

.....

.....

17. Explain the role played by ribosomes in inheritance.

(2mks)

.....

.....

.....

18. During germination and early growth, the dry weight of endosperm decreases while that of the embryo increases. Explain.

(2mks)

.....

.....

.....

.....

19. Name the two body parts of members of class arachinda.
(2mks)

.....

.....

.....

20. Which type of joint is found at the articulation of ;

a) Pelvic girdle and femur.
(1mk)

.....

b) Humerus and ulna
(1mk)

.....

21. a) Explain how the following prevent self pollination and self – fertilization

i) Protandry . (1mk)

.....

ii) Self sterility.
(1mk)

.....

b) Give two advantages of cross- pollination.
(2mks)

.....

.....

.....

22. What is the necessity of support in plants.
(2mks)

.....

.....

.....

23. Briefly define the following terms used in ecology.

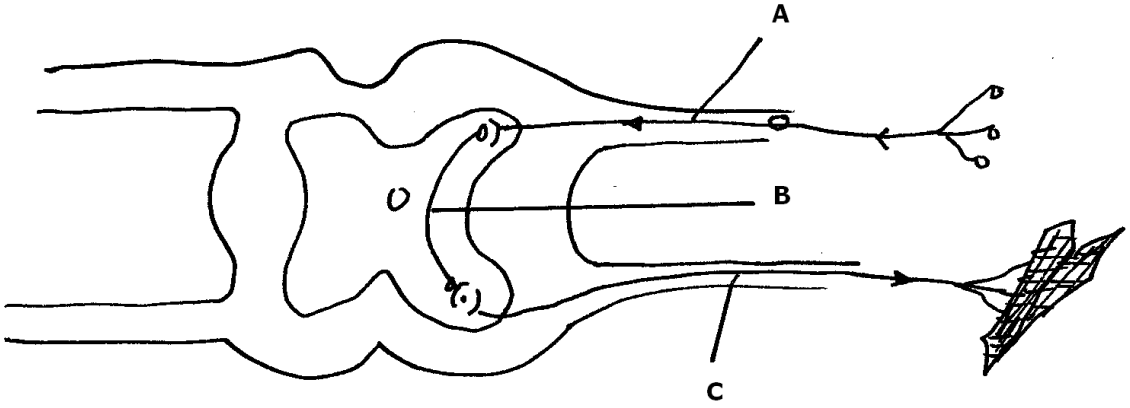
i) Synecology.
(1mk)

.....

ii) Habitat . (1mk)

.....

24. The diagram below represents a simple reflex arc.



a) Name the parts labeled A,B and C.
(3mks)

A .....

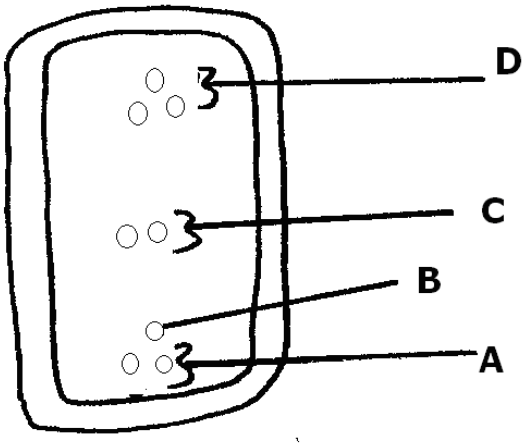
B .....

C .....

b) What is the role of part A.
(1mk)

.....

25. The diagram below shows a mature embryo sac.



a) Name the parts labeled A and D.
(2mks)

A .....

D .....

b) Which of the parts labelled above is fertilized to form a diploid zygote .
(1mk)

.....

26. Explain how the following factor reduce the rate of transpiration in plants.
(2mks)

a) Sunken stomata

.....

b) Temperature

.....

27. State two causes of coronary thrombosis.
(2mks)

.....

.....

.....

.....

28. What is oxygen debt?

(1mk)

.....

.....

.....

29. Distinguish between hypertonic and hypotonic solutions.

(2mks)

.....

.....

.....

30. State where the following process takes place.

(2mks)

(i) Glycolysis

.....

.....

(ii) Kleb Cycle

.....

.....

31. What is thigmotropism .

(2mks)

.....

.....

.....

32. Give two sites of gaseous exchange in plants.
(2mks)

.....

.....

.....

Name…… **Index**

No……/……

School…… **Date ……**

Candidate's Signature……

231/1
BIOLOGY
(THEORY)
PAPER 1
Time: 2 Hours

2012 PROJECTIONS -018
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

- Write your name, school and Index number in the spaces provided above.
- Answer **ALL** the questions in the spaces provided

For Examiners Use Only

Question	Maximum	Score
1 -25	**80**	

This paper consists of 8 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. State the functions of the following cell organelles.

   a) Golgi apparatus (2 mks)

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b) Ribosomes

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2. State the part of the eye involved in:

(i) Colour vision
(1mk)

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(ii) Preventing light from reflecting around inside the eye.
(1mk)

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.....

(iii) Protection of the eye ball.
(1mk)

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3. Explain why cells of an endosperm are triploid and not haploid.
(2mks)

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4. State four ways in which respiratory surfaces are suited to their functions.
(4mks)

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5. State three ways by which free nitrogen can be fixed.
(3mks)

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6. State the structural modifications of nephrons found in desert mammals.
(3mks)

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7. Explain the following terms

(a) Test cross (1mk)

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(b) Polyploidy

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(c) Phenotype (1mk)

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8. (a) Haemophilia is a sex – linked disorder caused by a recessive gene located on the

x – chromosomes. Give the genotype of a male haemophiliac individual .

(1mk)

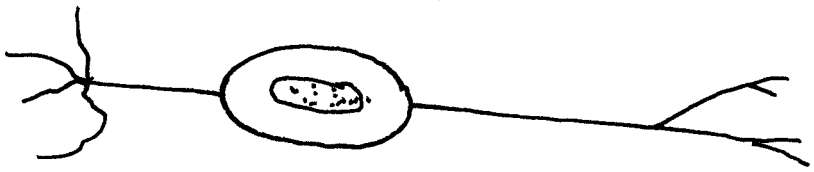
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(b) State two causes of variations in organisms that take place during gametogenesis. (2mks)

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9. The diagram below shows a neurone.



(a) Name the neurone.

(1mk)

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(b) State the functions of the following parts of a neurone.

(i) Nodes of ranvier. (1mk)

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(ii) Schwann cell

(1mk)

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10. (a) Wing of an insect, wing of a bird, hand of a man, flipper of a whale, foreleg of a horse

are locomotory structures in animals. Using the structures listed above state the ones considered as:

(i) Homologous structures.

(1mk)

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(ii) Analogous structures .

(1mk)

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(b) Identify the type of evolution that brings about:

(i) Homologous structures.

(1mk)

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(ii) Analogous structures.

(1mk)

.....

11. Name three types of muscles found in the human body.

(3mks)

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12. Explain what would happen to red blood cells if they are placed in a concentrated salt solution.

(2mks)

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13. (a) What is homeostasis.

(1mk)

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(b) How would you find out from a sample of urine whether a person is suffering from diabetes mellitus.

(3mks)

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14. State three adaptations of plants which enable them to reduce water loss.

(3mks)

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15. a) State the importance of placenta during pregnancy.

(2mks)

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(b) Name two mechanisms that hinder self fertilization in flowering plants. (2mks)

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16. (a) What are the advantages of fruit and seed dispersal.
(2mks)

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(b) State two characteristics of fruits and seeds dispersed by wind.
(2mks)

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17. State three importance of locomotion in living organisms.
(3mks)

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18. (a) Name a disorder in human blood that is caused by mutation .
(1mk)

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(b) Name **FOUR** types of chromosomal mutation.
(4mks)

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(c) State **TWO** causes of Mutations.
(2mks)

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19. Explain what happens when there is oxygen debt in human muscles.
(3mks)

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20. State **THREE** structural differences between ribonucleic acid.(RNA) and deoxyrobonuclei acid(DNA).
(3mks)

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21. (a) State the function of amylase in the human body.
(1mk)

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(b) Name two parts of the alimentary canal where amylase is secreted.
(2mks)

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22. Name the spore producing structures in
(2mks)

(a) Bryophytes.

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(b) Pteridophytes.

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23. How is an artery adapted to perform its functions .
(3mks)

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24. What will be the effect of having a low blood glucose level in the body.
(3mks)

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25. Name the type of response shown by.

(a) Leaves of Mimosa pudica when they fold after being touched.
(1mk)

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(b) Sperms when they swim towards ovum
(1mk)

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(c) Euglena when it swims towards the source of light.
(1mk)

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END

END

Name……. **Index No**……/…….

School……. **Candidates Signature**…….

Date…….

231/1
BIOLOGY
Paper 1
(THEORY)
TIME 2 HOURS

2012 PROJECTIONS -019
Kenya Certificate Of Secondary Education

INSTRUCTIONS TO CANDIDATES

- Write your name and Index Number in the spaces provided above.
- Sign and write date of examination in the spaces provided above.
- Answer **ALL** questions in the spaces provided.
- Mathematical tables and electronic calculators may be used.
- All workings **MUST** be clearly shown where necessary.

FOR EXAMINERS USE ONLY

Questions	Maximum Score	Candidates Score
1-27	80	

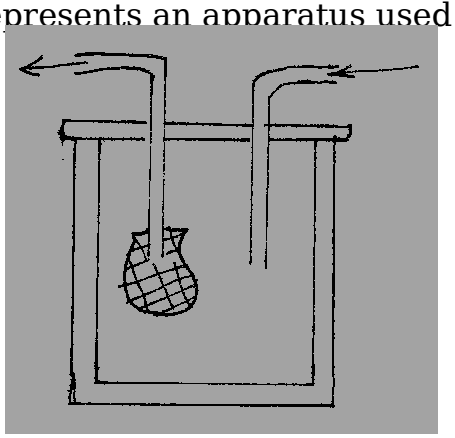
This paper consists of 9 printed pages
Candidates should check the question paper to ensure that all the Papers are printed as indicated and no questions are missing

1. Calculate magnification of a drawing which measures 4cm in diameter and its actual

END

diameter is 10cm (2mks)

2. The diagram below represents an apparatus used in biology laboratory



a) Name the apparatus .....(1mk)

b) What is the apparatus named in 2(a) above used for (1mk)

.....

3. State the role of amylase (1mk)

.....

4. Study the chart below and then answer the questions that follow

Gas	Inhaled air	Exhaled air from sleeping man	Exhaled air from a running man
Nitrogen	78%	78%	78%
Oxygen	21%	17%	12%
Carbon(IV) oxide	0.03%	4%	9%

(a) Explain the effect of exercise on the composition of exhaled air (3mks)

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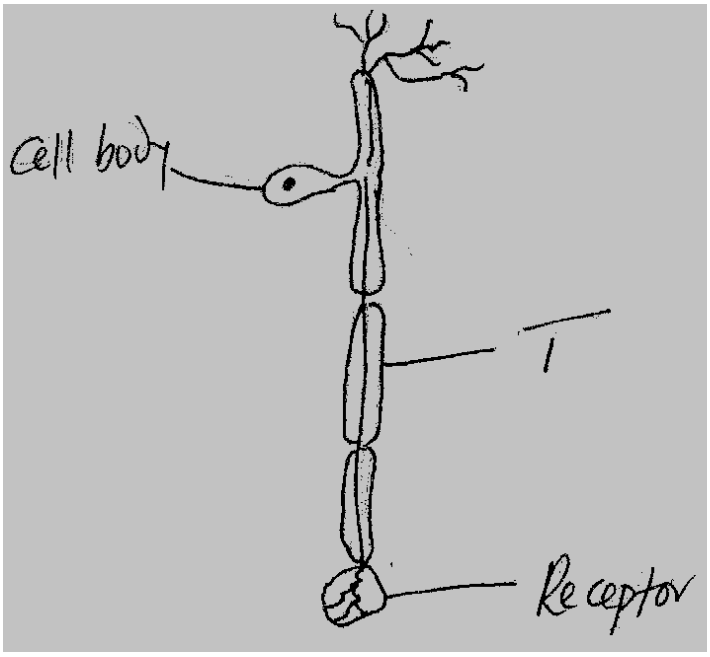
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5. The diagram below represents a nerve cell



a(i) Name the nerve cell .(1mk)

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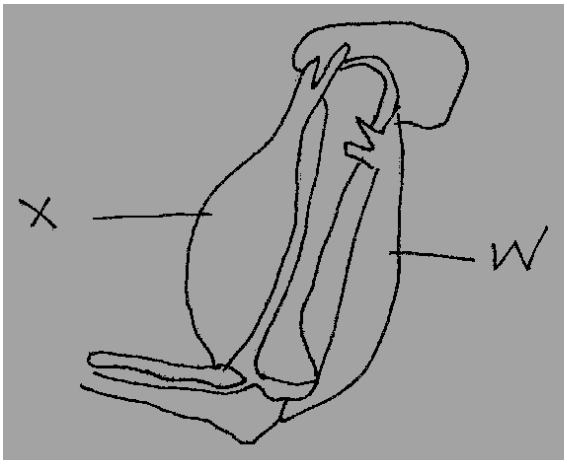
b(i) Give a reason for your answer in a(i) above (1mk)]

.....

(b) Name the structure labeled T(1mk)

.....

6. The diagram below represents an arm of human in bent position



(i) Identify the structures labeled

X.....(1mk)

W.....(1mk)

(ii) Explain how the identified structure (X and W) bring about straightening of the arm (2mks)

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7. (i) Name the products of anaerobic respiration in plants (1mk)

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(ii) Mention two industrial uses of anaerobic respiration (2mks)

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8. What is the function of the following cells in the retina of the human eye

(a) Cons.....

.....(2mks)

(b) Rods .....

.....(1mk)

9. The following are short messages (SMS) on cell phone communication

Intended message	Actual message received
(i) Let us go shopping	Let us go hopping
(ii) My team score	My mate scored

(a) Identify the type of mutation illustrated by (i) and (ii) above (2mks)

(i) ..... (ii).....

(b) Name the disorders in human that result from the mutation named in (a) above (2mks)

.....

.....

10. Explain how sunken stomata lower the rate of transpiration (2mks)

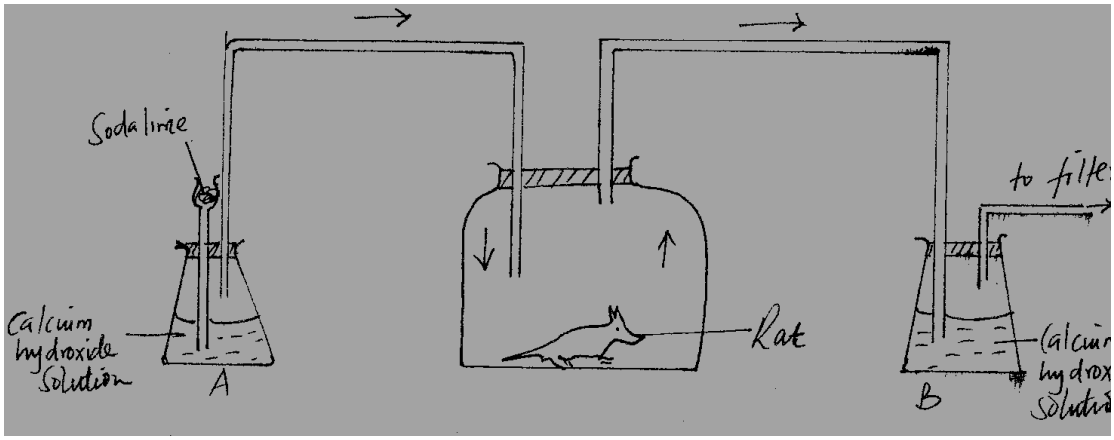
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11. Study the set up and answer the questions that follow



(a) Name the process that was being investigated (1mk)

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(b)(i) What observations were made in B after sometime (1mk)

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(iii) Explain the observation in (b)(i) above (2mks)

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12 Distinguish between endocrine and nervous system (4mks)

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13 (a) What is an allergic reaction (1mk)

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(b) Differentiate between Natural active immunity and natural passive immunity (2mks)

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14 (i) State the polysaccharide that thickness support tissues in plants (1mk)

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(ii) List 3 ways by which herbaceous plant stems attain support (3mks)

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15 State the functions of the following parts of the mammalian ear

(i) Tympanic membrane (2mks)

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(ii) Eustachia tube (1mk)

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(iii) Ear Ossicles (1mk)

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16 Name the organelles that would be found in large numbers in cells of a:-

(i) rapidly respiring tissue (2mks

Answer……

……

Reason……

.....

(ii) Secretory glands (2mks)

Answer.....

.....

Reason.....

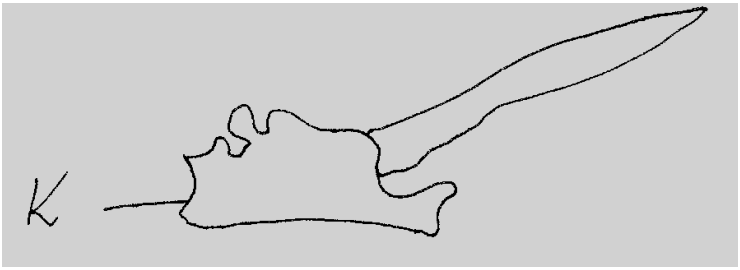
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17 Explain why digestion of starch does not take place in the stomach (2mks)

.....

.....

18 The diagram below represents a mammalian bone



(i) Identify the bone (1mk)

.....

(ii) Give two reasons for your answer (2mks)

.....

.....

(iii) Label part K (1mk)

.....

19 (a) Name the spore producing structures in pteridophyta (1mk)

.....

(b) Give one similarity and one difference between divisions pteridophyta and Bryophyta(2mks)

Similarity .....

.....

Difference .....

.....

20 The heart is myogenic. Explain (2mks)

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21 Explain why insects are very active yet they have an open circulatory system (2mk)

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22 State 3 ways in which the trachea in humans is adopted to its functions (3mks)

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23 Give the importance of the following steps in testing a leaf for starch

(a) Boiling in water (2mk)

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(b) Boiling in alcohol (1mk)

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(c) Dipping in water after boiling in alcohol (1mk)

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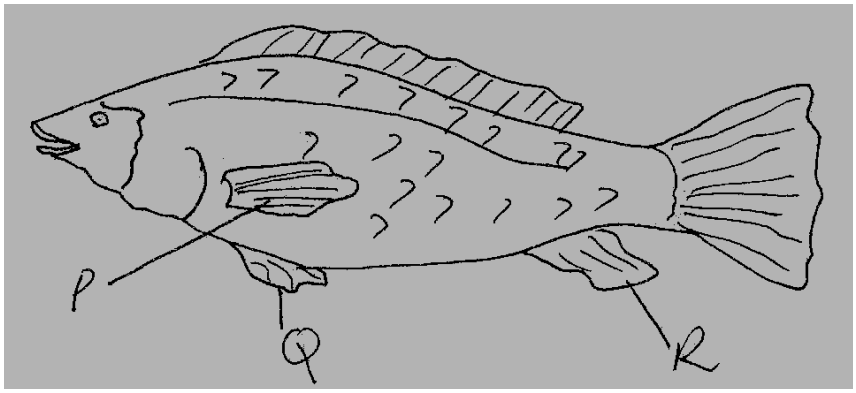
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24 A child fell and hit her head on the floor. She later suffered loss of memory. Which part of the brain was damaged? (1mk)

.....

25 Study the diagram below showing the external structures of tilapia fish and answer the questions that follow.



(a) Name fins P and Q. (2mks)

P..... Q.....

(b) What role is played by these fins in locomotion (2mk)

.....

26 The sperm is a specialized cell. Give three ways in which it is modified to perform its
function. (3mks)

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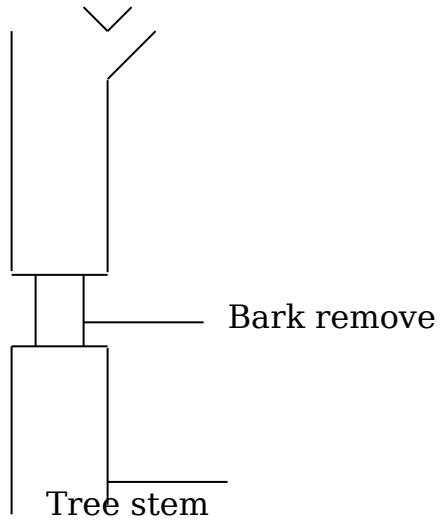
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27 Study the diagram below and answer the questions that following



Beginning of experiment

(a) (i) Make a drawing of the stem at the end of the experiment (2mks)

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