# KCSE MOCKS

SET 1

# BIOLOGY

## FOR MARKING SCHEMES

## CALL/WHATSAPP 0705525657

*A COMPILATION OF BIOLOGY MOCKS*

*IDEAL FOR KCSE REVISION PURPOSES*

**MR ISABOKE 0705525657**

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# TRIAL 1

**Name…… Index No…….**

**School…….. Sign…….**

**Date…….**

**231/1**
**BIOLOGY**
**(THEORY)**
**PAPER 1**
**TIME: 2 HOURS**

**FOR EXAMINER'S USE ONLY.**

| Question | Maximum score | Candidate sscore |
|---|---|---|
| 1 - 25 | 80 | |

This paper consists of 10 Printed pages. Candidates should check the question paper to ensure that all the Papers are printed as indicated and no questions are missing.

1. a) Name the cell organelle which forms spindle fibres during cell division. (Imk)

……

……

b) Other than the function given in (a) above, state one other function of the organelle. (lmk)

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2. Name the diseases caused by the following parasites.

i. Salmonella, typhi (lmk)

……

ii. Entamoeba histolytica (lmk)

……

3. a) Name the part of a chloroplast where the following proceses occur. (2mks)

i. Photolysis

……

ii. Carbon (iv) oxide fixation.

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……

b) State how the part named in a (i) is suited to its function. (lmk)

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4. a) State three pieces of evidence which suggest that organic evolution is ongoing. (3mks)

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b) Giving examples explain what you understand by the following terms as used in evolution. (4mks)

i. Homologous structures

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ii. Analogous structure

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5. a) Give the genetic term used to describe the numbers of chromosomes resulting from

i. Meiosis (lmk)

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ii. Non-disjunction (lmk)

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b) Recessive trait is only expressed phenotypically when an organism is in _____condition. (lmk)

c) Who postitulated the theory that acquired characteristics are inherited? (lmk)

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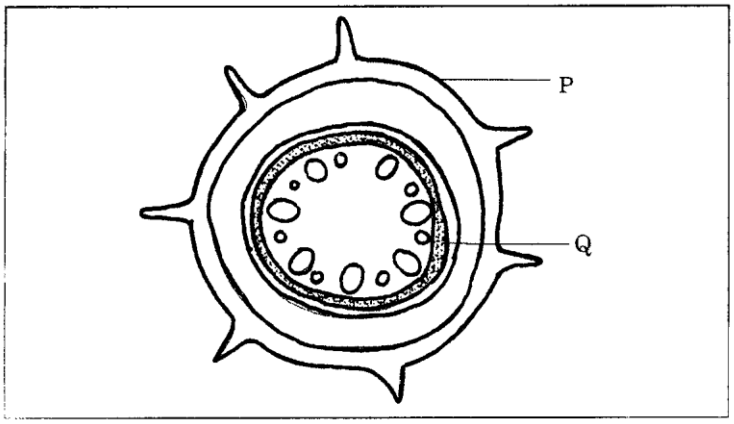
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6. Name two classes of animals that have a cephalothorax. (2mks)

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7. The diagram below represents a section through a plant part.




a) (i) Name the part of the plant from which the section was obtained. (lmk)

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ii. Give a reason for your answer in a(i) above. (I mk)

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b) On the diagram, label X to indicate the part which would be stained if the plant was left to stand in coloured waters for 30 minutes before the section was made. (lmk)

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c) State the function of the part labeled Q. (lmk)

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8. Give one similarity and one difference between water and wind dispersed seeds. (2mks)

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9. (a) Name the parts of a mammalian ear which carry out the following functions.

i) Balance and posture. (lmk)

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ii) Hearing. (lmk)

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(b) State the importance of presence of glands in auditory canal. (lmk)

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10. (a) State the function of co-factors in cell metabolism. (Imk)

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(b) Give one example of a metallic co-factor. (lmk)

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I I. A form IV student was found having the following symptoms

- Bleeding of gums
- Poor healing of wounds.

(a) What deficiency disease was the student likely to be suffering from? (1mk)

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(c) Suggest the kind of food to be given to rectify the condition. (lmk)

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12. Define the following ecological terms:

(a) Niche. (lmk)

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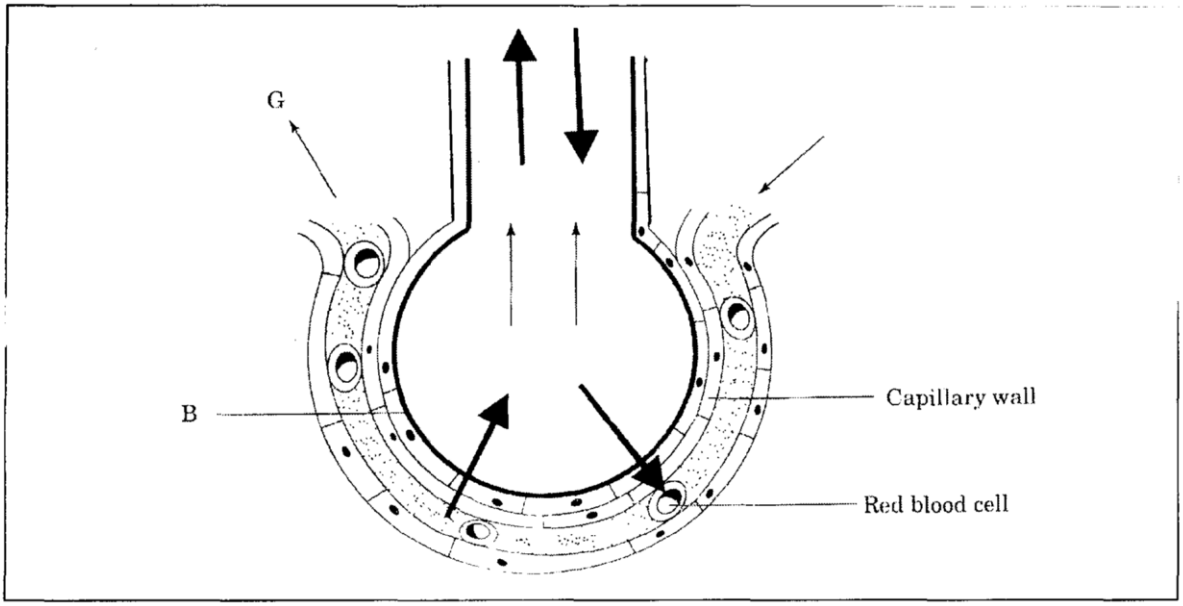
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(b) Ecosystem. (lmk)

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13. The diagram illustrates gaseous exchange in alveolus.




(a) Name the feature labeled B. (lmk)

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(b) Which blood vessel receives blood leaving at G? (lmk)

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(c) (i) How is the capillary wall suited for gaseous exchange? (lmk)

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(ii) Name the process by which gases move in and out of red blood cells. (1mk)

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14. For each of the following insect hormones, identify the site of secretion and state the function it serves. (4mks)

(a) Ecdysone;

Site of secretion

……

Function

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(b) Juvenile hormone:

Site of secretion

……

Function

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15. (a) State three differences between light microscope and electron microscope. (3mks)

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(c) State two advantages of using low power magnification over high power magnification when viewing specimen under a light microscope. (2mks)

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16. Name the disease characterized by

(a) Glycosuria. (1mk)

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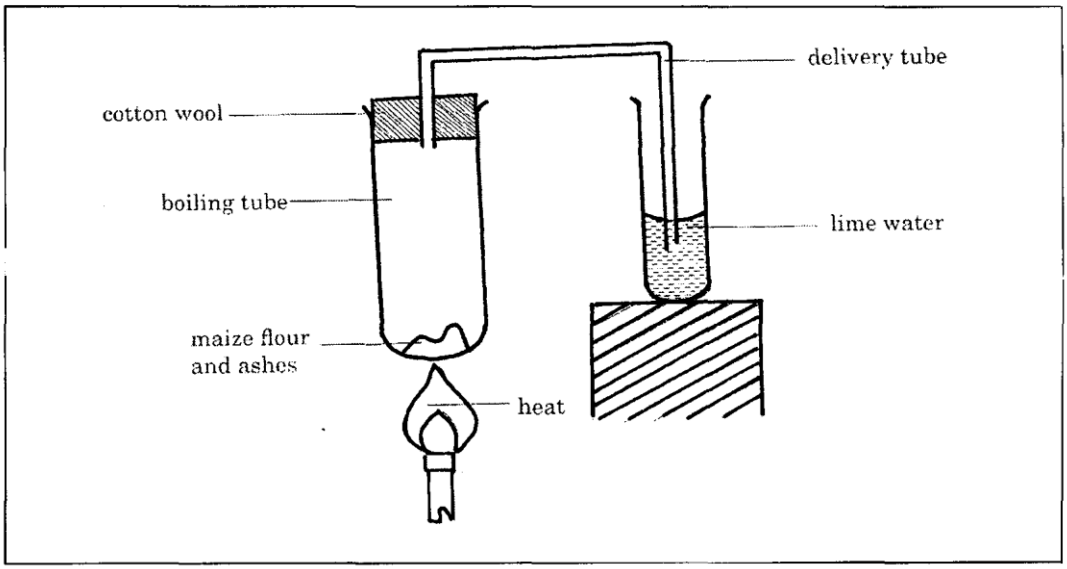
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(b) Diuresis. (lmk)

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17. The diagram below show a set-up to illustrate phenomenon.




(a) State the aim of the experiment. (lmk)

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(b) (i) Identify one error in the set up. (lmk)

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(ii) State the expected results if the set up was corrected. (lmk)

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(c) What was the use of ash in the experiment? (1mk)

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18. State three ways by which human skin protects body tissues. (3mks)

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19. (a) Why is blood group AB described as universal recipient? (2mks)

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(b) Suggest why blood does not clot in blood vessels of a healthy person. (lmk)

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20. (a) State why the placenta is considered as an endocrine gland. (lmk)

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(b) Describe how the embryo in human is protected during pregnancy. (2mks)

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

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22. (a) State why people who sweat a lot tend to eat salty food. (lmk)

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(b) Explain the effect of salty food on urine production in a person. (3mks)

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23. (a) A person touches a hot object and suddenly withdraws the hand. Using arrows, show how the impulse that leads to withdrawal of the hand travels between the neurons in a reflex arc.(lmk)

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(b) (i) Name the response shown when free swimming algae move towards optimum light intensity. (lmk)

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(ii) State the biological importance of response shown by algae. (lmk)

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24. (a) Name the plant excretory product which is used for:

i. Treatment of malaria. (lmk)

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ii. As a beverage. (lmk)

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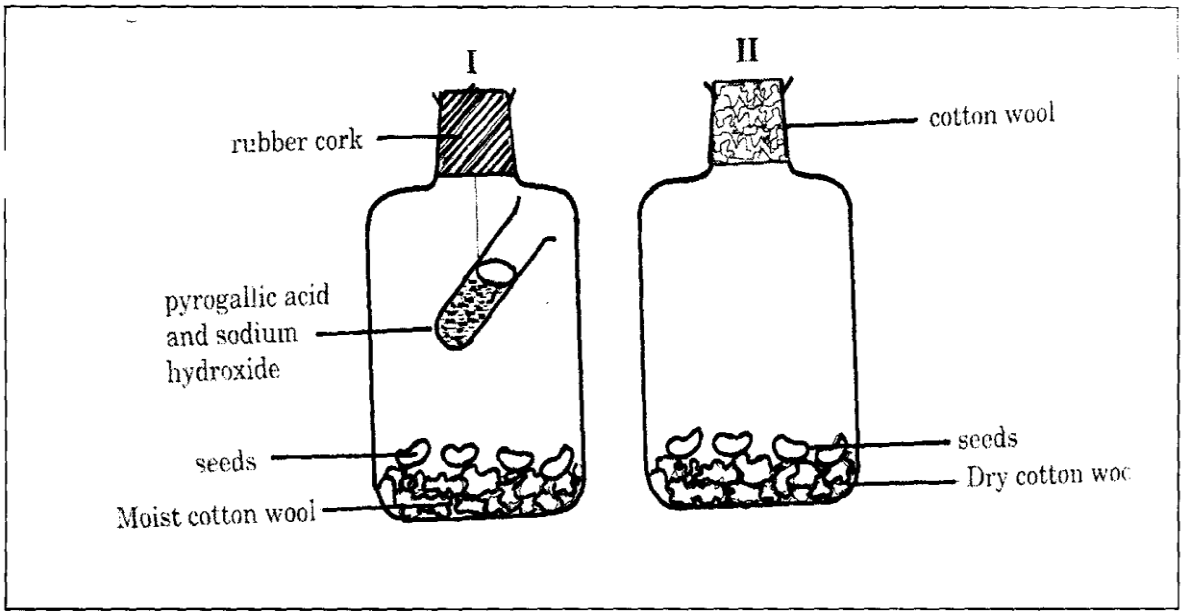
……

(b) Explain why lactic acid is not considered as an excretory product though it's toxic to tissues. (lmk)

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25. Experiment set ups I and II were used to investigate conditions required in germination. The seeds in the two set ups did not germinate.




(a) Explain why?

i. Seeds in set up I did not germinate. (2mks)

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ii. Cotton wool was placed at the mouth of the flask in set up II. (lmk)

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(b) Name the condition which prevented germination in set up II. (1 mk)

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# TRIAL 1

**NAME:…… INDEX NO:……**

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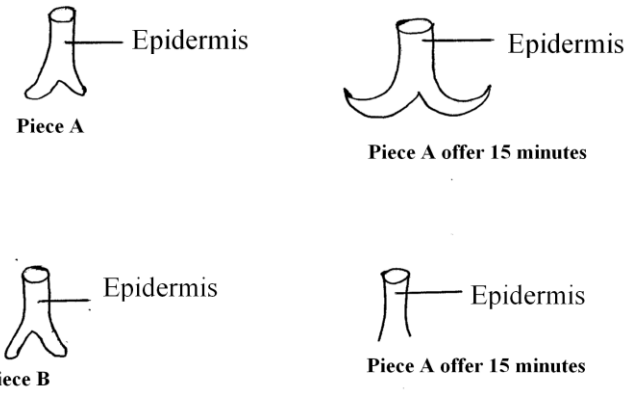
**232/2**
**BIOLOGY**
**PAPER 2**
**THEORY**
**TIME: 2 HOURS**

1. a) Define the term cell physiology (1mk)

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b) Two pieces of leaf petioles were cut as shown in the diagram below, then each piece placed in solution of different concentration.




i) What physiological process was being investigated in this experiment?

(1mk)

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ii) Suggest the type of solution piece B was placed

(1mk) .....

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iii) Explain the appearance of piece A after 15 minutes

(3mks) .....

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c) In land plants, water logging slows down the uptake of certain minerals. Suggest a reason for this. (

2mks)

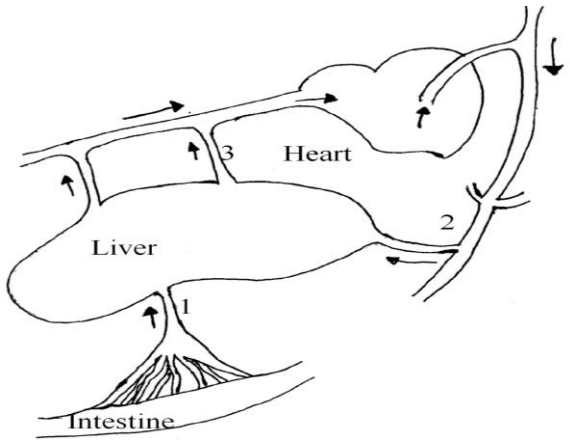
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2. The figure below is a simplified diagram of mammalian circulatory system. Study it and answer the questions that follow.




a) Explain why the level of blood sugar in vessel 3 would be higher than that in vessel 1. during fasting. (2mks)

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b) Name the vessel that has the highest concentration of urea among vessels labeled. 1,2 and 3 (1mk)

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c) In what ways does blood vessel 1 differ from most of the other blood vessels in the body? (1mk)

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d) Name the nutrients that is only transported in small quantities in vessels 1 following absorption.

(1mk)

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.....

e) Why is it necessary that blood from digestive tract pass through the liver before entering the general circulation. (1mk)

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3. A Pure – line pea plant with green pods was crossed with a pure – line plant with yellow pods. All $F_1$ plants had green pods out of 1160 $F_2$ plants, 856 had green pods and 304 had yellow pods.

a) i) Identify the dominant and the recessive genes.

(1mk)

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.....

ii) Using letter G to represent dominant gene and g to represent recessive gene, work out the phenotype of the $F_1$ generation.

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b) Showing your working, state the number of plants with; (3mks)

i) Recessive genes;

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ii) Dominant genes;

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iii) Heterozygous genes;

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c) i) What is sickle cell Anemia?

(1mk)

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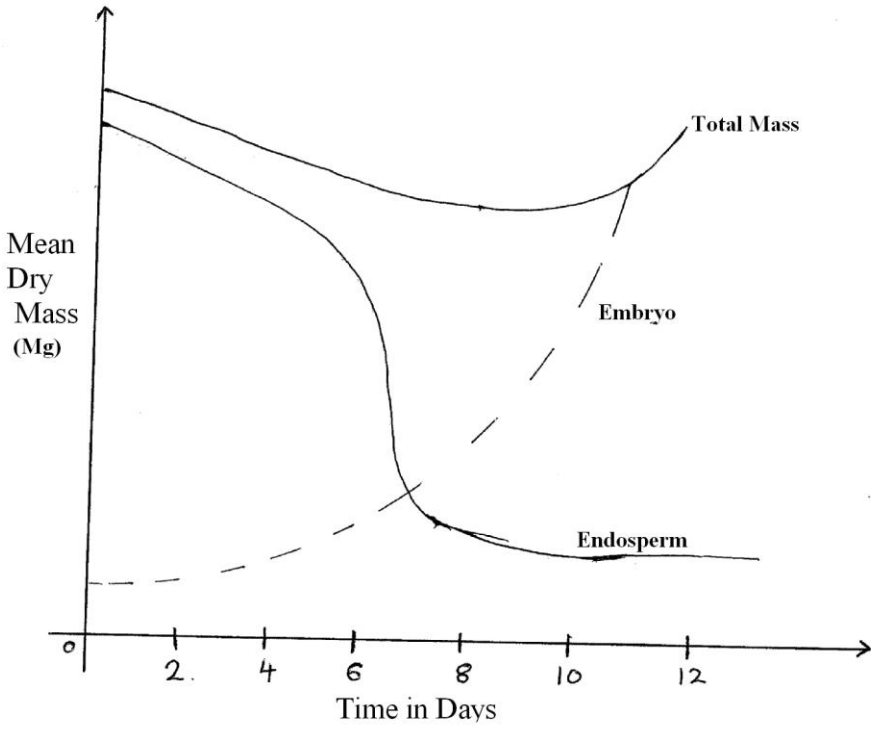
ii) State one problem faced by people suffering from sickle cell anemia?

(1mk)

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4. The graphs below show the changes in mean dry mass of endosperm, embryo and total mass of germinating maize.




Account for the ;

a) Decrease in the dry mass of endosperm from day 1 to day 9 (4mks)

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b) Increase in dry mass of embryo from day 1 to day 9 (1mk)

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c) Decrease in total mass upto day 6. (1mk)

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d) Increase in total mass after day 6 (2mks)

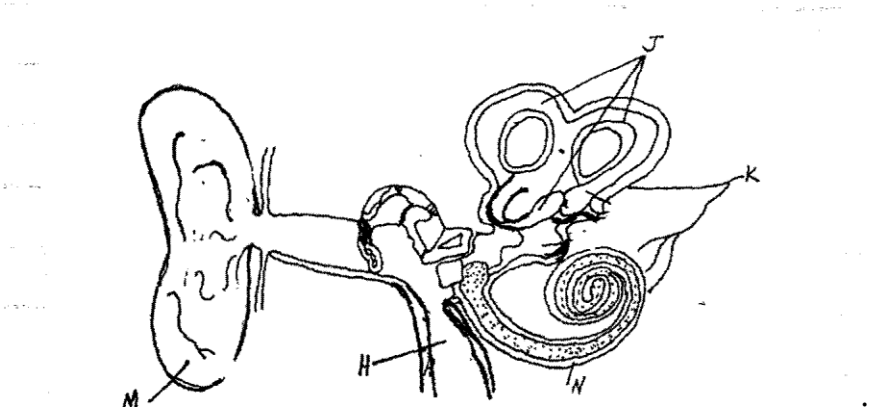
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5. The diagram below represents a section through the mammalian ear. Study it and answer the questions that follow




a) Name the structure labeled H and J. (2mks)

H.....

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J.....

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b) State how the structure labeled H,M and N are adapted to their functions. (3mks)

H.....

.....

M.....

.....

N.....

.....

c) State what would happen if the structure labeled K was completely damaged. (1mk)

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d) Name the fluid contain in structure N. (1mk)

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e) Apart from hearing, state the other role performed by the human ear. (1mk)

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***SECTION B ( 40 MKS)***

***Answer question 6 ( compulsory) and either question 7 or 8 in the space provided after question 8.***

***6.*** In an experiment to investigate certain processes in a given plant species, the rate of carbon (iv) Oxide released and intake were measured over a long period of time. The results of the investigation were as shown below.

| Time of the day ( Hours) | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|
| Volume of carbon (iv) Oxide Consumed ($mm^3$/ min) | 10 | 43 | 69 | 91 | 91 | 50 | 18 | 0 | 0 | 0 |
| Volume of Carbon (iv) Oxide released ($mm^3$/ Min) | 38 | 22 | 10 | 3 | 3 | 6 | 31 | 48 | 48 | 48 |

a) On the same axes draw graphs of volume of carbon (iv) oxide consumed and released against time. (7mks)

b) Name the chemical process changes represented by;

i) Carbon (iv) Oxide consumed (1mk)

ii) Carbon (iv) Oxide released (1mk)

c) Account for the shape of the curve for

i) Carbon (iv) oxide consumed (3mk)

ii) Carbon (iv) Oxide released (3mk)

d) i) What is meant by compensation point (1mk)

ii) From the graph, find the time of the day when the plant attained

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compensation point. (2mks)

e) Explain how temperature affects the rate of carbon (iv) oxide consumption in the plant.(2mks)

7. a) What is meant by natural selection (3mks)

b) Describe how natural selection brings about adaptation of species to its environment. (17mks)

8. a) Describe the characteristics and functions of the three types of muscle found in the mammalian body. (11mks)

b) Explain how the various components of blood are adapted to perform their functions. (9mks)

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# TRIAL 2

**NAME**……**INDEX NO**……

**SCHOOL** ……**SIGNATURE**……..…..…**DATE**……

**231/1**

**BIOLOGY**

**PAPER 1**

**2HRS**

1. Name the field of science that specializes in the study of chemical changes in an organism. (1mrk)

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……

2. Explain how light intensity would affect the distribution of fish in a pond. (3mrks)

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3. a) ***State*** the significance of the following in evolution

   i) Accumulation of variations in organisms (1mrk)

   ……

   ……

   ii) Survival of the fittest (1mrk)

   ……

   ……

   b) Explain what leads to struggle for existence in organisms exploiting the same ecological niche (1mrk)

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4. What is the effect of antidiuretic hormone in the human body. (2mrks)

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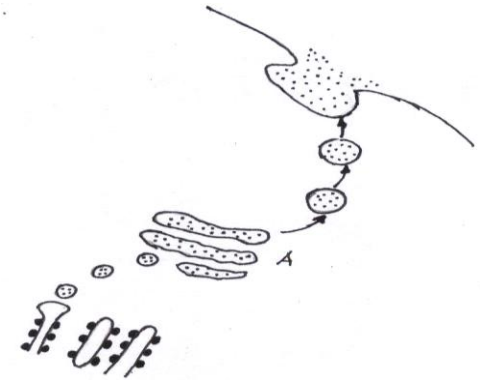
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5. ***Identify*** the organelle marked A. (1mrk)

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b) Give **three** functions of the organelle named in (a) above. (3mrks)

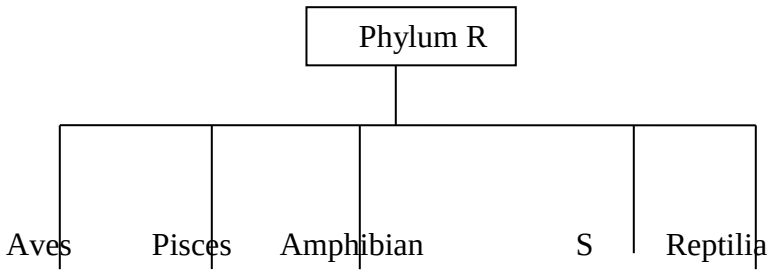
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6. Study the classification illustrated below and answer the question that follows;




a) Name the phylum R (1mrk)

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……

b) State ***two*** distinguishing characteristics of member of class S. (2mrks)

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7. The figure below illustrates a portion of a chromosome with genes named A, B, C, S,Q and R.

| | | | | | |
|---|---|---|---|---|---|
| A | B | C | S | Q | R |

Use the diagrams similar to the one above to illustrate the changes if the above chromosome undergoes the following mutations affecting only gene C and S.

i) Deletion (1mrk)

ii) Inversion (1mrk)

iii) Duplication (1mrk)

8. State the functions of the following in plants.

i) Piliferous layer (1mrks)

……

……Pericycle

(1mrk)

……

……

ii) Root cap (1mrk)

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……

9. Complete the table below for mineral nutrients in plants. (3mrks)

| ***Mineral nutrients*** | ***Function*** | ***Deficiency symptom*** |
|---|---|---|
| | Synthesis of proteins and protoplasm | Stunted growth |
| Calcium | | Structural growth and weak |
| | Formation of part of chlorophyll | Yellowing of leaves |

10. a) At what stage of mitosis do chromosomes replicate to form daughter chromatids?

(1mrk)

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b) A diploid cell was observed to have 46 chromosomes.

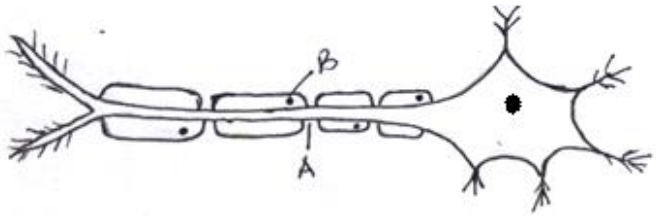
i) How many chromatids would the cell produce at the end of meiotic cell division?

(1mrk)

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11. The diagram below shows a specialized cell.




a) Name the type of cell shown above. (1mrk)

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b) Name the part labeled B. (1mrk)

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c) State the function of the part labeled A (1mrk)

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12. A new born baby has generally a heartbeat of 120 to 140 per minute while that of adult is 70 minutes on average. Account for the difference.

(3mrks)

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13. What makes young herbaceous plants remain upright?

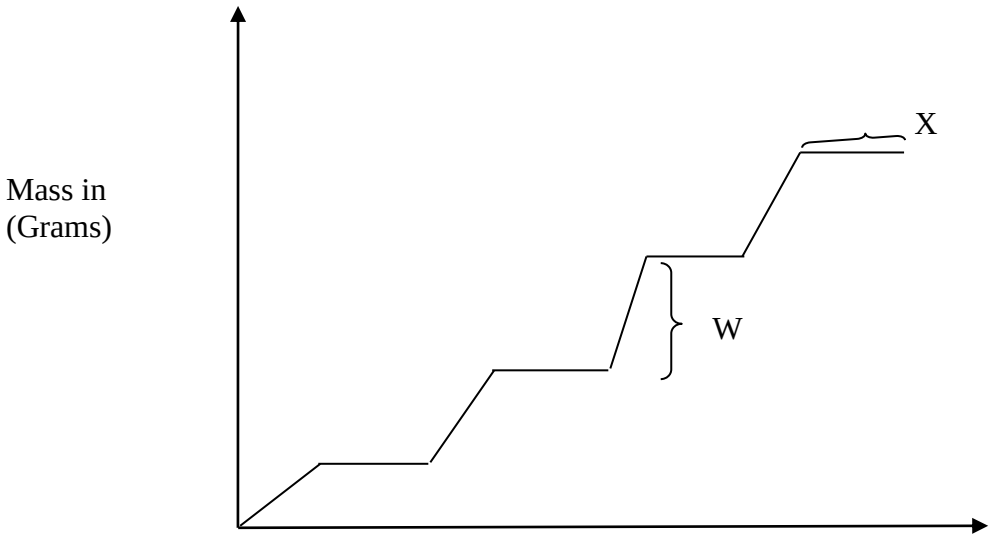
(2mrks)

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14. The graph below represents the growth of an animal in a certain phylum.




a) Name the type of growth pattern shown in the graph. (1mrk)

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

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

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15. ***Give two*** structural differences between smooth muscles and skeletal muscles. (2mrks)

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16. Why are people with blood group O called universal donors. (2mrks)

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17. Name the site in mammalian lungs where gaseous exchange occurs. (1mrk)

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18. Active yeast cells were added to dilute sugar solution in a container. The mixture was left in a warm room. After a few hours bubbles of gases were observed escaping from the mixture.

a) Write an equation to represent the chemical. (1mrk)

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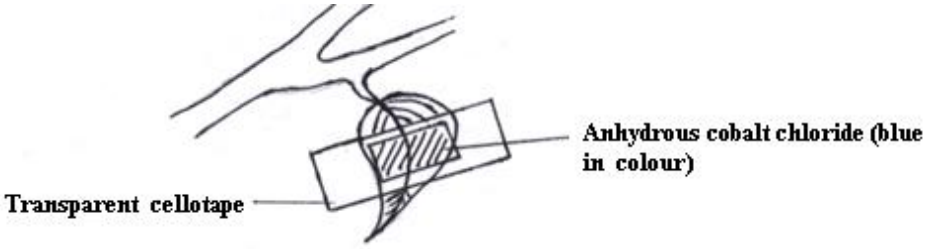
b) What is the importance of this type of reaction in industries? (2mrks)

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19. The diagram below shows an experiment done on a leaf of terrestrial plants to investigate a certain biological process in a mesophyte.




a) Explain the expected results (2mrks)

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b) What was the use of the cellotape? (1mrk)

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20. State ***two*** ways in which the ileum is structurally adapted to the absorption of digested food.

(2mrks)

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21. a)State the organism that causes the following diseases; (2mrks)

i) Trichonomiasis

……

ii) Bilharzia

……

(b)Name a disease in humans that is caused by **plasmodium falciparum.** (1mrk)

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22. Explain how the iris alters the size of the pupil. (2mrks)

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23. Identify the mode of feeding of the

a) Animal whose dental formula is given below

$I\ ^{0}/_{3}\ C^{0}/_{1}\ Pm^{3}/_{3}\ M^{3}/_{3} = 30$ (1mrk)

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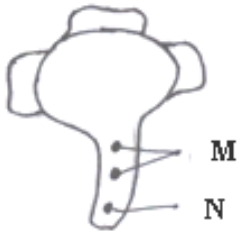
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b) Give reasons for your answer in a) (i) above. (2mrk)

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24. The diagram below shows a pollen tube as it develops down the style.




a) Name the parts labeled M and N. (2mrks)

M……

……..

N……

……

b) State the functions of the part labeled M. (2mrks)

……

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25. A rainbow lizard was seen basking on a rock.

a) ***Name two*** ways by which it gained heat by these behavioural process. (2mrks)

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b) ***State*** the role of scales in reptiles. (1mrk)

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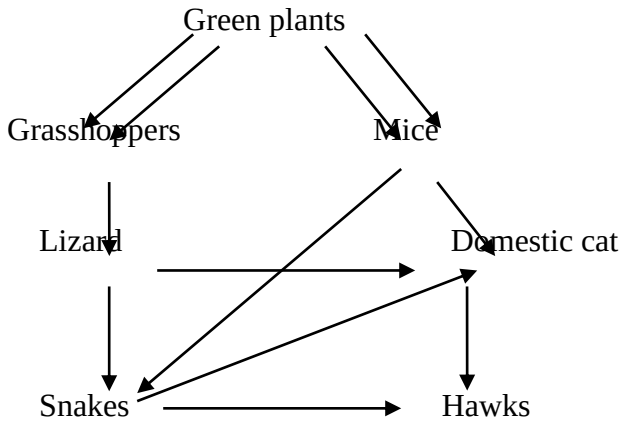
26. Explain why few organisms are found inhabiting higher altitude than lower altitude.(4mrks)

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27. The chart below shows a feeding in a certain ecosystem.




a) Construct **two** food chains ending with a tertiary consumer. (2mrks)

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b) Which organisms have the highest variety of predators in the food web. (2mrks)

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c) Suggest **one** way in which the ecosystem would be affected if there was a prolonged drought. (1mrk)

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28. A traffic police stretched his arm to the right. To cause this motion of the arm, explain the behavior of his biceps and triceps. (2mrks)

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29. Table below shows two mammalian hormones for each hormone. ***State*** the site of production and its function in the body. (4mrks)

| **Hormone** | **Site of production** | **Function** |
|---|---|---|
| Oestrogen | | |
| Aldosterone | | |

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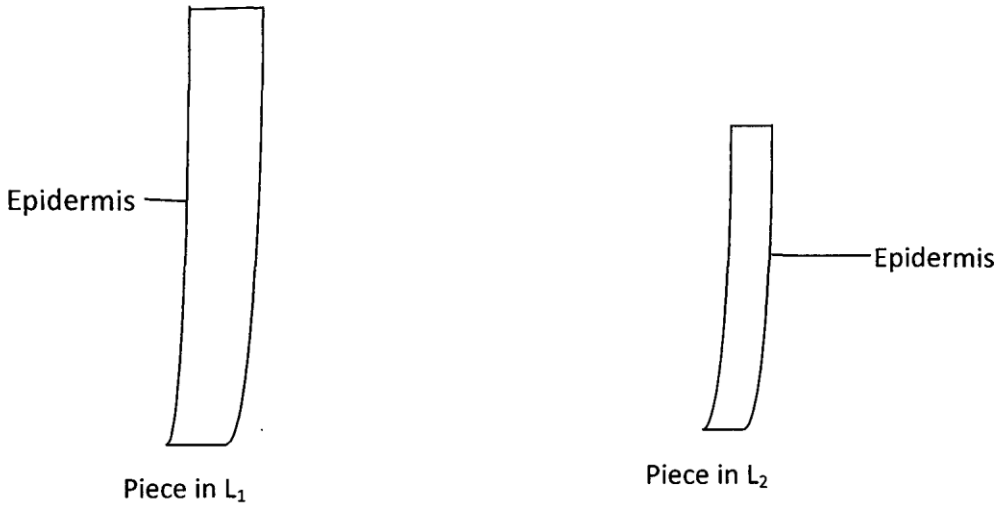
# TRIAL 2

**Name…… Index No…….**
**School…….. Sign…….**
**Date…….**

**231/2**
**BIOLOGY**
**(THEORY)**
**PAPER 2**
**TIME: 2 HOURS**

**Answer ALL questions in this section in the spaces provided.**

1. A freshly obtained dandelion stem measuring 5cm long was split lengthwise to obtain two similar pieces. The pieces were placed in solutions of different concentrations in Petri dishes for 20 minutes. The appearance after 20 minutes is as shown.




(a) Account for the appearance of the pieces in solutions L1 and L2 (6mks)

$L_1$

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$L_2$

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(b) State the significance of biological process involved in the experiment. (2mks)

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2. (a) Give three reasons in each case why support is necessary in

(i) Plants (3mks)

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(ii) Animals (3mks)

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(b) Why is movement necessary in animals? (2mks)

(i)

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(ii)

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3. In maize the gene for purple colour is dominant to the gene for white colour. A pure bleeding maize plant with purple grains was crossed with a heterozygous plant.

(a)

(i) Using letter G to represent the gene for purple colour, work out the genotypic ratio of the offspring. (5mks)

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(ii) State the phenotype of the offspring. (lmk)

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(b) What is genetic engineering? (lmk)

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(c) What is meant by hybrid vigour? (lmk)

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4. (a) Distinguish between pyramid of numbers and pyramid of biomass. (2mks)

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(b) Give <u>three</u> reasons for loss of energy from one trophic level to another in a food chain. (3mks)

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(c) Describe how the belt transect can be used in estimating the population of a shrub in a grassland. (3mks)

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5. (a) What is meant by the terms?
(i) Epigynous flower? (lmk)

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(ii) Staminate flower? (lmk)

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(b) Name the essential parts of a flower. (2mks)

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(c) How are the male parts of a wind pollinated flower adapted to their functions? (4mks)

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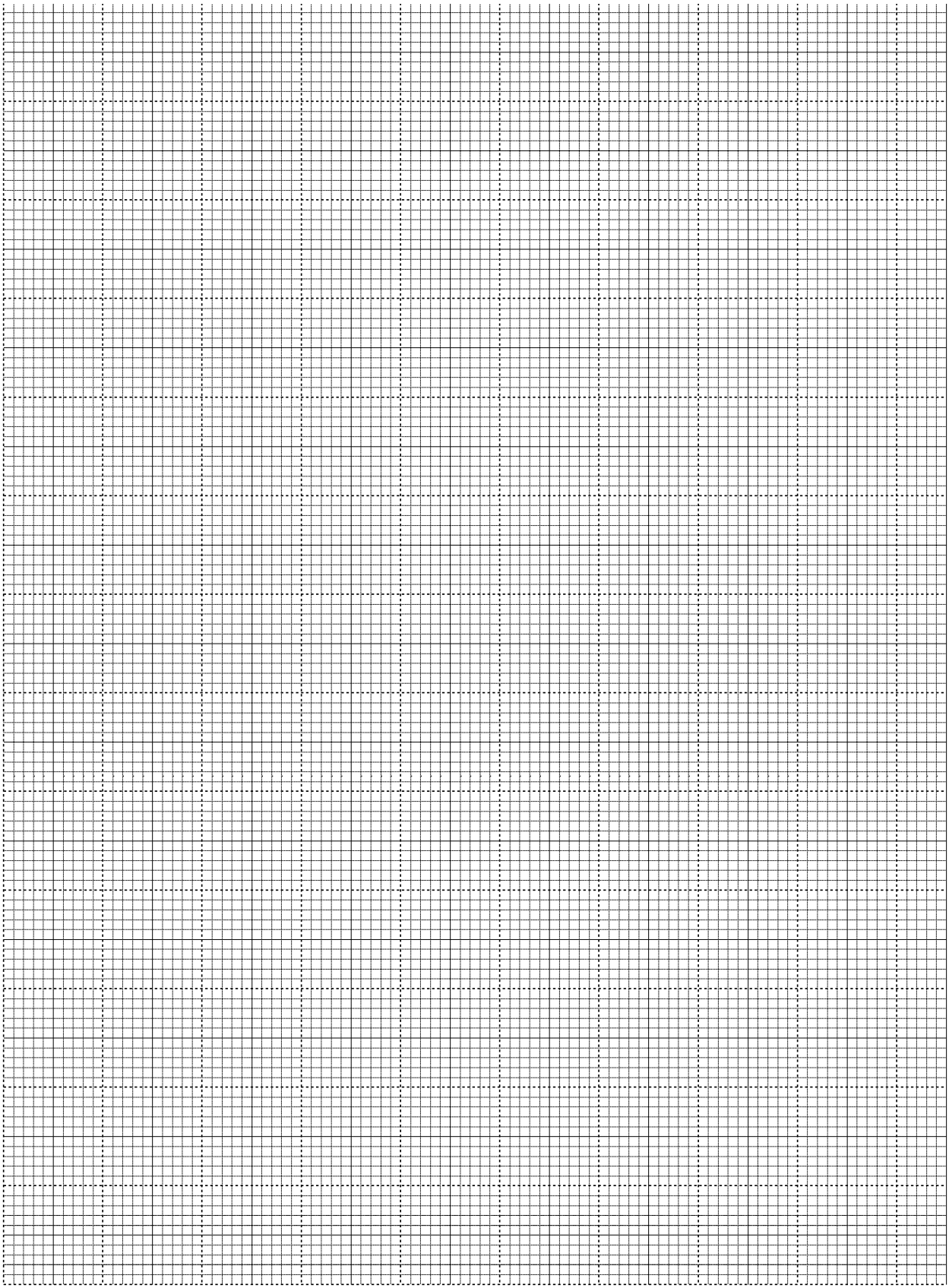
**SECTION B (4OMARKS)**

**Answer question <u>6 (compulsory)</u> in the spaces provided and either question 7 or 8 in the spaces provided after question 8.**

6. In an experiment to determine the effect of ringing on the concentration of sugar in phloem, a ring of bark from the stem of a tree was cut and removed. The amount of sugar in **grams per** 16cm$^3$ piece of bark above the ring was measured over a 24hour period. Sugar was also measured in the bark of a similar stem of a tree which was not ringed. The results are shown in the table below.

| Time of the day | Amount of sugar in grams per 16cm$^3$ piece of bank | |
|---|---|---|
| | Normal stem | Ringed stem |
| 0645 | 0.78 | 0.87 |
| 0945 | 0.80 | 0.91 |
| 1245 | 0.81 | 1.01 |
| 1545 | 0.80 | 1.04 |
| 1845 | 0.77 | 1.00 |
| 2145 | 0.73 | 0.95 |
| 0045 | 0.65 | 0.88 |

(a) Using the same axes, plot a graph of the amount of sugar against time. (6mks



(b) At what time was the amount of sugar highest in the-:
(i) Ringed stem. (lmk)

……

(ii) Normal stem. (lmk)

……

(c) How much sugar would be in the ringed stem if it was measured at 0345 hours? (lmk)

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(d) Give reasons why there was sugar in the stems of both trees at 0645 hours. (2mks)

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(e) Account for the shape of the graph for the tree ringed stem between
(i). 0645 hours and 1545 hours (3mks)

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(ii) 1545 hours and 0045 hours (2mks)

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(f) Name the structures in the phloem that are involved in the translocation of sugars. (2mks)

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(g) Other than sugars name two compounds that are translocated in phloem. (2mks)

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7. (a) State four characteristics of gaseous exchange surfaces. (4mks)
(b) Describe the mechanism of gaseous exchange in a mammal. (l6mks)
8. (a) What is meant by the term digestion? (2mks)
(b) Explain the role of bile in the digestion of food. (4mks)
(c) Describe the digestion of protein in the human body. (l4mks)

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# TRIAL 3

**Name……** **Index No. …….**

**School ……...** **Date……. …….**

**Sign……. …….**

**231/1**
**BIOLOGY**
**PAPER 1**
**Time: 2 Hours**

**FOR EXAMINERS USE ONLY**

| QUESTION | Max Score | Candidate Score |
|---|---|---|
| 1 – 33 | 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. a) Name the antigens that determines human blood groups. (2mks)

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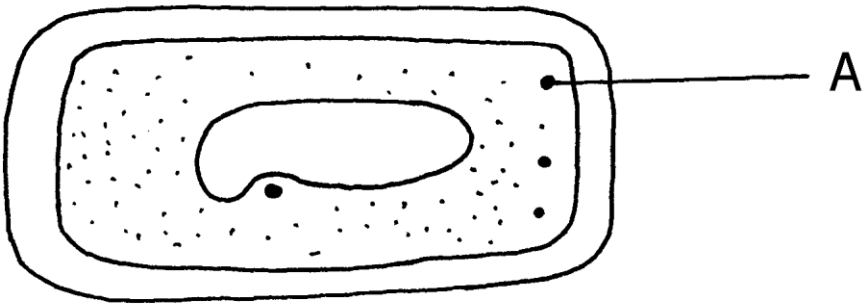
b) State the adaptation of the red blood cells that make them move in blood capillaries. (1mk)

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2. The figure below is a diagram of a cell as seen under the light microscope (3mks)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657




State <u>three</u> structures that show that these is a plant cell. (3mks)

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3. Why is it more advantageous to breath through the nose than through the mouth. (3mks)

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4. State <u>three</u> characteristics of members of Bryophyta. (3mks)

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5. State <u>three</u> characteristics of a population (3mks)

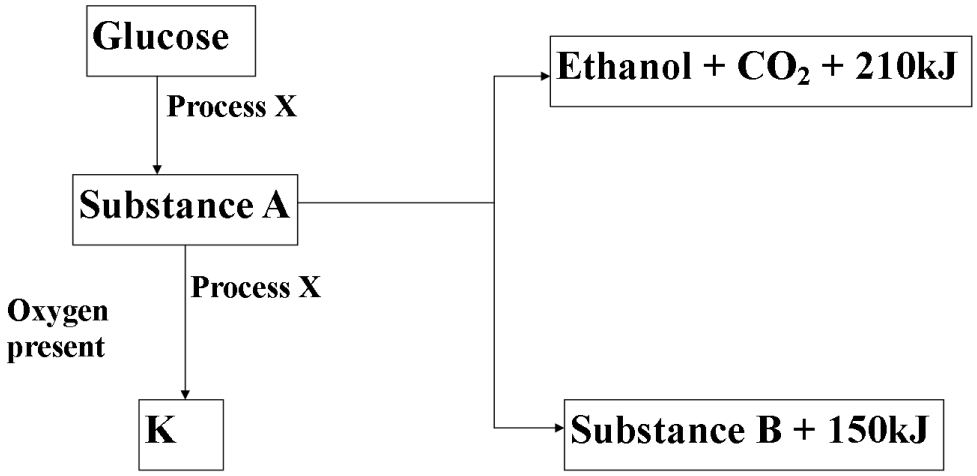
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6. The diagram below represents a simple respiratory pathway in cells (2mks)




a) Name the process marked X and Y (2mks)

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b) Name substances represented by K. (1mk)

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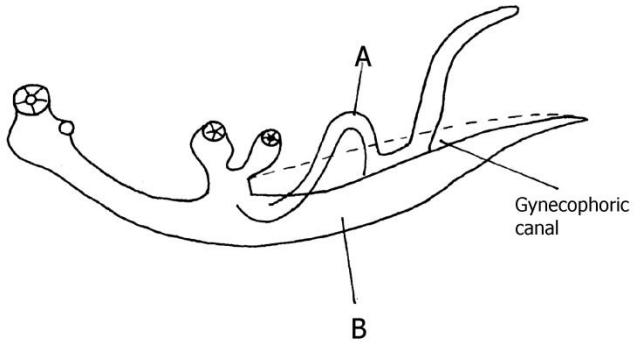
.....

c) State the name of substance B. (1mk)

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7. The diagram below shows two organisms of the same species (2mks)




a) State the sex of organism A and B. (2mks

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b) Name the disease caused by the above organism. (1mk)

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8. Identify the physiolocal process involved in the following

a) Feeding in venus fly trap( insectivorous plant) (1mk)

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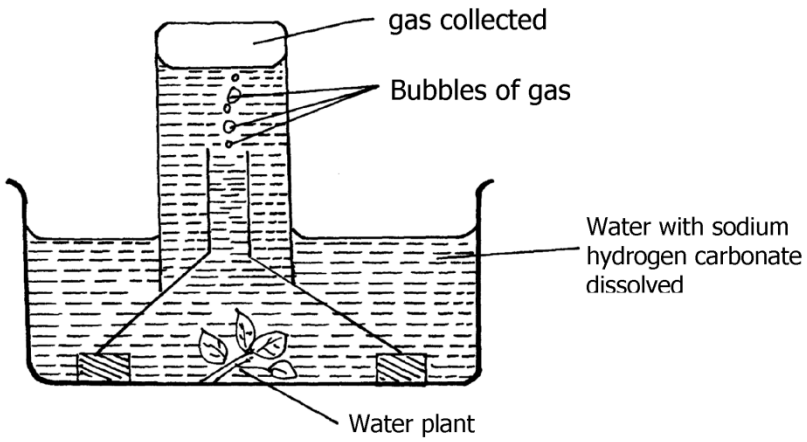
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b) Absorption of mineral salts by plant roots. (1mk)

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9. An experiment on photosynthesis was set up as shown below (4mks)




a) What was the aim of this experiment. (1mk)

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b) What gas is produced during this experiment. (1mk)

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c) Why was sodium hydrogen carbonate added to water during this experiment. (1mk)

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10. Distinguish between the following

a) Habitat and ecological niche. (2mks)

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b) Intraspecific and interspecific competition . (2mks)

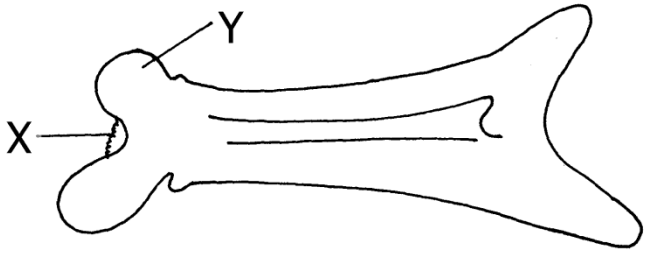
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11. The diagram below represents a mammalian bone. (1mk)




i) Name the bone (1mk)

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ii) Identify the part labelled X (1mk)

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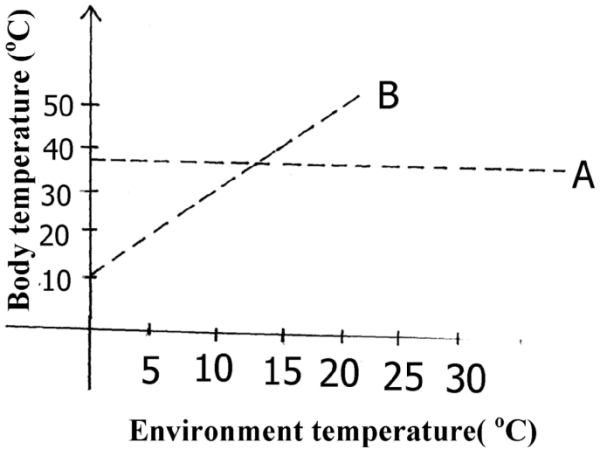
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iii) Name the bone that articulates with the part labelled Y (1mk)

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12. Body temperature of two animals A and B were taken over the increase in environmental temperature. The results are shown in the diagram below.




a) What name is used to describe group of animals represented by

A..... (1mk)

B..... (1mk)

b) State <u>two</u> advantages of the group of animals represent by A over that of B. (2mks)

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13. Briefly explain how the following affect the rate of transpiration (2mks)

i) Sunken stomata (2mks)

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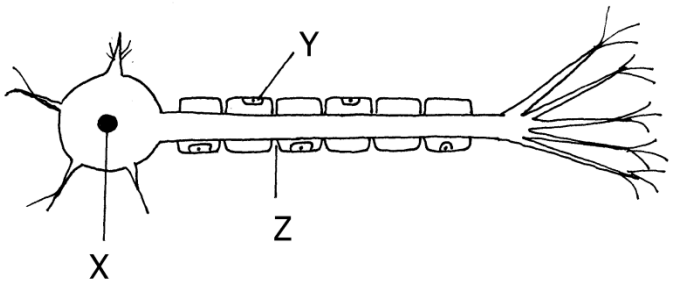
ii) Hairy leaves (2mks)

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14. The diagram below shows the structure of a neurone




i) a) Identify the type of neurone drawn above (1mk)

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b) Name the parts labelled X and Y

X

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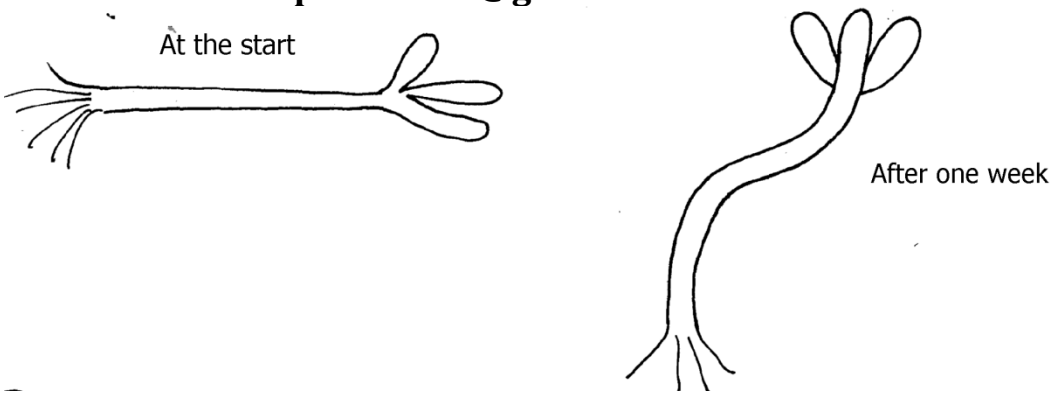
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Y

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15. A form four girl uprooted a young plant and laid it horizontally on the ground. After one week it was observed that the shoot of the same plant had bend upwards while theroot downwards as shown below.




Account for the observations made. (3mks)

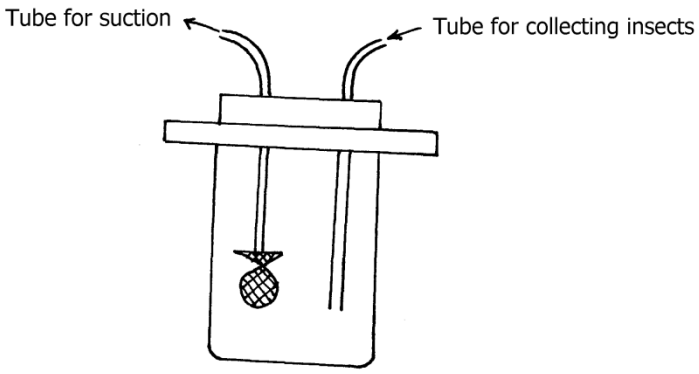
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16. The diagram below shows on apparatus used in collection of specimen




c) Identify the apparatus (1mk)

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d) State its use (1mk)

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17. Give a reason why staining is necessary when preparing specimen for observation under a microscope. (1mk)

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18. The scientific name for a domestic cat is ***felis catus***. Outline the rules that were never followed in writing the name (3mks)

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19. An organelle magnified 6000 times by an electrons microscope, measured 3mm in diameter.

Calculate its real diameter in micro metres.

Show your working (2mks)

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20. What happens when a young herbaceous plant is well watered with strong salt solution. (2mks)

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21 Name the cell organelles that would be found in abundance in

a) Skeletal muscus (1mk)

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b) Palisade cells (1mk)

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22. State one role of the following elements in the human body. (1mk)

a) Iron (1mk)

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b) Chlorine (1mk)

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23. a) What is mean by the term assimilation. (1mk)

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b) State <u>two</u> ways in which end products of lipids digestion are assimilated. (2mks)

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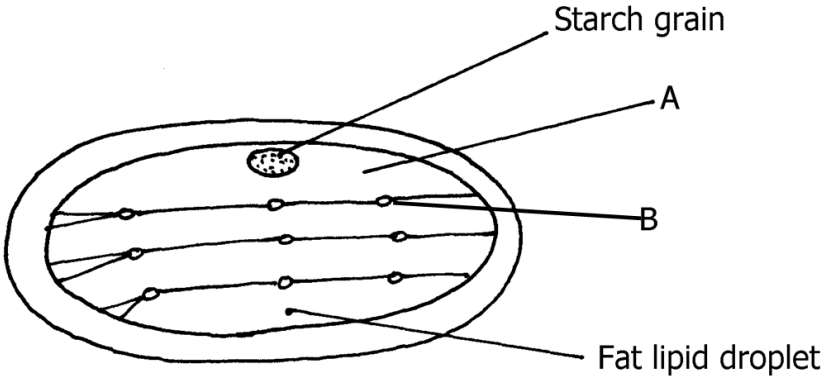
24. Enzyme + substrate ⇌ enzyme + products from the above equation name <u>two</u> properties of enzymes exhibited in the equation. (2mks)

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25. Study the diagram below and answer the questions that follow (2mks)




What process takes places in A and B. (2mks)

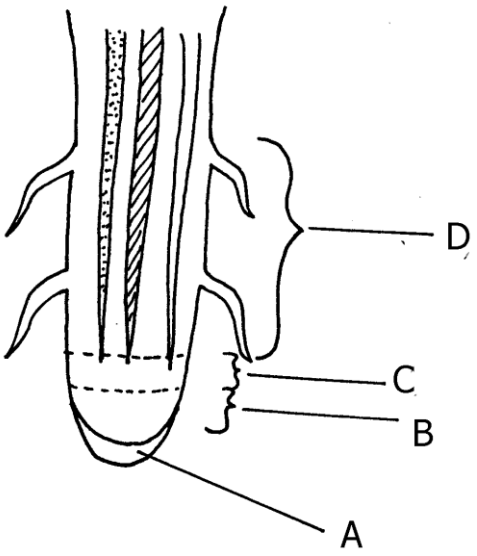
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26. The diagram below represents a section of the dicot root apex. (2mks)




a) State the role of the part marked A (1mk)

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b) State <u>three</u> characteristics of the cells found in region B. (3mks)

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27. Give two adaptations of spiracles to their functions. (2mks)

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28. Differentiate between lactic acid fermentation and alcoholic fermentation. (2mks)

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29. State two importance of the placenta during pregnancy (2mks)

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30. State one function of water in a germinating seed. (1mk)

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31. Explain the following terms

a) Test cross (1mk)

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b) Phenotype (1mk)

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32. Haemophilia is a sex – linked disorder caused by a recessive gene located on the X – chromosome. Give the genotype of a make haemophiliac individual. (1mk)

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33. Distinguish between divergent and convergent evolution. (2mks)

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# TRIAL 3

**NAME**……**INDEX NO**……

**SCHOOL** …….

**SIGNATURE**……..…..…**DATE**……

**231/2**

**BIOLOGY**

**PAPER 2**

**2HRS**

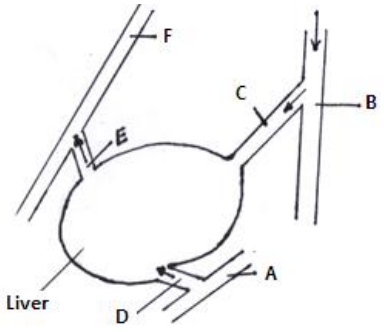
| Section | Question | Maximum score | Candidates score |
|---|---|---|---|
| A | 1 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| B | 5 | 8 | |
| | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 20 | |
| | **Total score** | **80** | |

End

**SECTION A (40MARKS)**

***Answer all the questions in this section in the spaces provided.***

1. The diagram below illustrates blood circulation in certain organs in humans.




a) Name the part labeled A. (1mrk)

.....

b) Name the blood vessels labeled B and F. (2mks)

B.....

F.....

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c) State how the composition of blood in vessel E differs from that in vessel D. (3mks)

| E | D |
|---|---|
| | |

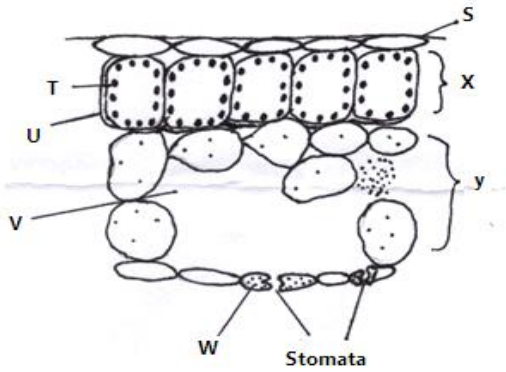
d) Explain the role of bile in the process of digestion. (2marks)

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2. The diagram below represents a section through a leaf of a terrestrial plant.




a) Name the structures labeled S, X, Y and V (2marks)

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.....

b) State the roles of each of the parts labeled V and W. (2mrks)

V.....

.....

W.....

.....

c) ***State two*** ways in which structures labeled X and Y are adapted to their functions. (4mks)

X.....

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.....

.....

Y.....

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3. A common species of rats has individuals with white, black or grey coats. During a study a rat with white coat was crossed with a rat with black coat. Both parents were pure lines. All the offspring in F1 generation had grey coats. Using letter B to represent the gene type for black coat and W for white coat, answer the questions that follow.
   a) Suggest a reason to explain why there were no white or black rats in the F1 generation. (1mark)

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   b) The F1 offspring were selfed to get F2 generation. Work out the phenotypic ratio of F2. Show your working. (5marks)

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   c) ***Name one*** trait in human beings that is determined by multiple allele. (1mrk)

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   d) ***Name one*** genetic disorder affecting the human eye. (1mrk)

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      .....

4. During an ecological field work, a group of students caught 240 grasshoppers, marked them and then released them back to the study area. After one day they caught 160 grasshoppers and found that 40 were marked. Using the formula;

$$P = \frac{F.C.M \times S.C}{S.C.M}$$

Where P =Total population
F.C.M = First capture marked
S.C = Second capture
S.C.M = Second capture marked

a) Work out the total population of the grasshoppers in the study area. (2mrk)

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b) b) Identify the method used to capture the grasshoppers. (1mrk)

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c) Name the instrument and chemical the students used to collect and mark the grasshoppers. (2mrks)

i) Instrument for collection .....

ii)Chemical for marking .....

d) State any ***one*** assumption the students made during the field work. (1mrk)

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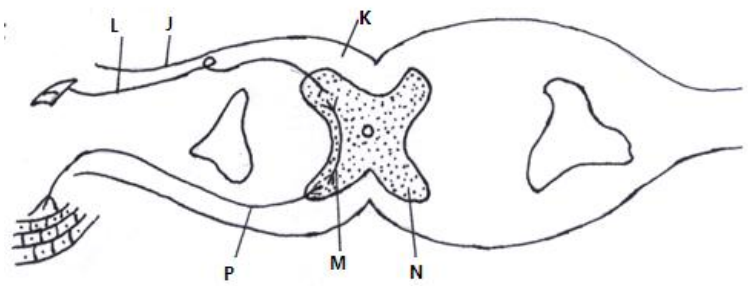
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e) The students observed the organisms and placed them into their correct phylum and class. Name the phylum and class.

i) Phylum.....

ii) Class .....

5. The diagram below shows a transverse section of the spinal cord.




a) Name the parts labeled K and N. (2mrks)

K .....

N .....

b) Describe briefly how the impulse transmission occurs through the structures in the diagram (3mrks)

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.....

c) ***State three*** differences between simple and conditioned reflex actions. (3mrks)

| Simple reflex | Conditioned reflex |
|---|---|
| i)<br>ii)<br>iii) | |

## SECTION B (40MARKS)

***Answer questions 6 (COMPULSORY) and Either question 7 or 8 in the spaces provided after the question 8.***

6. Rice seeds were soaked overnight. Fresh mass and dry mass of a sample of 20 seeds was obtained and recorded in the table. The rest of the seeds were planted in a tray that had soil and well watered daily. Twenty of the seeds/seedlings were removed from the soil every two days for two weeks. Their fresh and dry mass were taken and recorded in the table as shown below.

| Time in days | Fresh mass in (g) | Dry mass in (g) |
|---|---|---|
| 0 | 14.0 | 4.0 |
| 2 | 18.0 | 3.5 |
| 4 | 24.5 | 2.5 |
| 6 | 32.0 | 1.5 |
| 8 | 38.5 | 2.0 |
| 10 | 41.0 | 3.0 |
| 12 | 43.0 | 4.5 |
| 14 | 45.0 | 6.0 |

a) Using the same axes, plot two graphs to represent changes in fresh and dry mass over the two –week period (7mrks)

b) What would be the fresh and dry mass of the seedlings at day 9. (2mrks)

i) Fresh mass .....

ii) Dry mass .....

c) Account for the change in fresh mass and dry mass between day 0 and day 6. (4mrks)

i) Fresh mass

.....

.....

.....

.....

ii) Dry mass

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d) Explain the change in dry mass from day 8 (2mrks)

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e) Explain why a sample of 20 seeds was used instead of one seed. (2mrks)

.....

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.....

f) ***State one*** factor within and one factor outside the seed that cause dormancy. (2mrks)

i) Within the seed .....

ii) Outside the seed .....

g) ***Give one*** characteristic of a meristematic cell (1mrk)

.....

.....

7. Explain the evidences of organic evolution in life forms. (20mrks)
8. Describe how gaseous exchange takes place in terrestrial plants. (20mrks)

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# TRIAL 4

**Name……. Index No……/…….**

**School……Date ……..…**

**Candidate's Signature……**

**231/1**

**BILOGY**

**PAPER 1**

**(THEORY)**

**Time: 2 Hours**

*This paper consists of 8 printed pages.*

*Candidates should check the question paper to ascertain that all pages are printed as indicated and no questions is missing.*

1. Name one factor in nature that increases the process of evolution. (1mk)

   ……

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2. What is meant by the term "oxygen debt" (2mks)

   ……

   ……

3. Differentiate between characteristics of membrane of monera and those of protoctista (2mks)

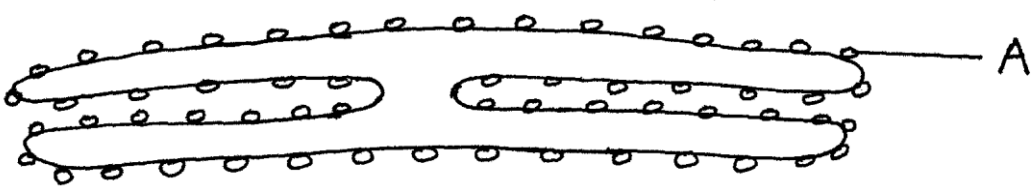
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4.




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(a) Name the organelle drawn above (1mk)

……

(b) State function of the structure labeled A (1mk)

……

5. State two functions of the substance secreted by sebaceous glands. (2mks)

……

……

6. In an experiment, the pitultary gland of a rat was removed.

(a) State the effect this will have on the quantity of urine produced by the rat. (1mk)

……

……

(b) Give a reason for your answer in (a) above. (2mks)

……

……

7. The lungs and ileum are adapted for absorption .State three features they have in common which facilitate absorption. (3mks)

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……

8. State the function of the diaphragm in the light microscope. (1mk)

……

……

9. Explain why food is stored in an insoluble form in the cells of living things. (1mk)

……

……

10. Name two components of blood that are not present in the glomerular filtrate. (2mks)

……

……

11. (a) State the importance of the following features in gaseous exchange .

(i) Cartilages in gaseous exchange (1mk)

……

……

(ii) Moisture on the surface of alveoli (1mk)

……

……

(b) Name two site where gaseous exchange takes place in terrestrial plants. (2mks)

……

……

12. Explain how the following adaptains minimize the rate of transpirations.

(a) Sunken stomata (1mk)

……

……

(b) Leaf drooping (1mk)

……

……

(c) State <u>two environmental factors</u> that influence the rate of transpiration. (2mks)

……

……

13. State the role of decomposition in an ecosystem. (2mks)

……

……

14. An animal is found to have large glomeruli and short loop of Henles .Account for the presence of

(i) Large glomeruli (1mk)

……

……

(ii) Short loop of Henle. (1mk)

……

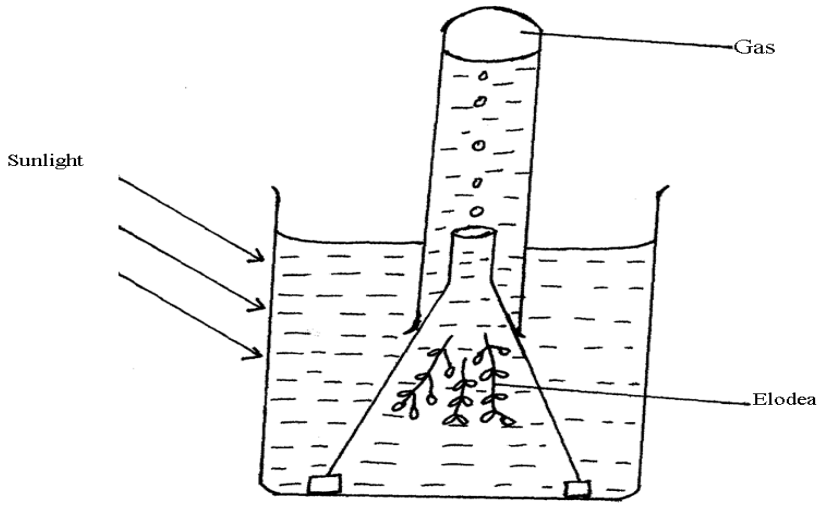
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(iii) State the possible aquatic habitat (1mk)

……

……

15. The diagram below represent a set up that was used to investigate a certain process in a plant.




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

……

……

(b) Name the gas collected in the gas jar (1mk)

……

(c) State the factor that would affect the process (1mk)

……

……

16. Name the sites where light and dark reactions of photosynthesis take place. (2mks)

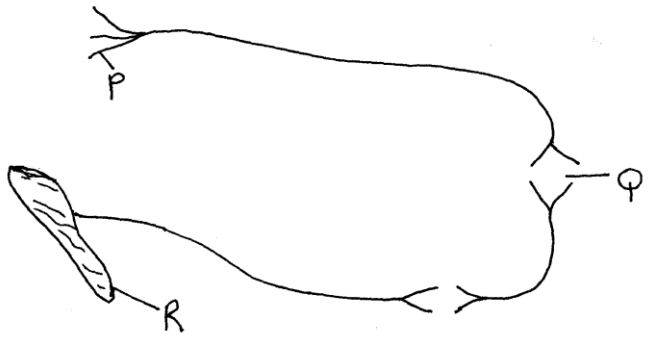
(i) Light reaction

……

(ii) Dark reaction

……

17. The diagram below represents a reflex arc in human beings



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

Q

……

R

……

(b) What is the function of part labeled P ? (1mk)

……

……

(c) Using arrows indicate the direction of impulse transmission on the diagram (1mk)

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

(i) Autecology

……

……

(ii) Synecology

……

……

(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 | 450 | 0 |
| B | 185 | 270 |
| C | 03 | 15 |

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

A

……

B

……

C

……

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



(a) (i) Name the bone shown above? (1mk)

……

……

(ii) State one reason for your answers in (a)(i) above (1mk)

……

……

(b) Which bones articulate with bone shown in the diagram above at the notch (1mk)

……

……

20. (a) Explain why pepsin in stomach of man is secreted in inactive form. (1mk)

……

……

(b) Which gland secrets pepsinogen. (1mk)

……

21. Name the regions in plants where the following take place (2mks)

(i) Primary growth

……

(ii) Secondary growth

……

22. The figure below illustrate a portion of chromosome with genes E,G,H,P,Q and R

| E | G | H | P | Q | R |
|---|---|---|---|---|---|

Using diagrams similar to the one above, illustrate the changes that the above chrosome would Undergo .If the following <u>mutations</u> occurred on gene H and P.

(a) Deletion (1mk)

(b) Inversion (1mk)

(c) Duplication (1mk)

23. (a) Name the type of skeleton that arthropods have. (1mk)

……

……

(b) What substance is the arthropods skeleton made of? (1mk)

……

……

24. In view of modern genetics, explain why Lamarks theory is unacceptable. (2mks)

……

……

……

……

25. State two ways in which genetic engineering is applied in the field of medicine. (2mks)

……

……

26. What is the functional difference between a tendon and ligament. (1mk)

……

……

27. (a) How is fovea centrails adapted for its function in the human eye. (2mks)

……

……

……

……

(b) A person was not able to see far objects clearly but could not view near objects clearly. Name the eye – defect the person had. (1mk)

……

……

……

……

(c) How can the defect be corrected. (1mk)

……

……

28. State two functions of a chloroplast. (2mks)

……

……

29. State three differences between osmosis and active transport. (3mks)

| Osmosis | Active transport |
|---|---|
| | |

30. (a) State two functions of an ovary in a human female. (2mks)

……

……

(b) State two advantages of internal fertilization in mammals. (2mks)

……

……

31. State two features of petals that enhances insect pollination. (2mks)

……

……

……

……

32. How are halophytes adapted for survival in their habitats. (2mks)

……

……

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# TRIAL 4

**Name……** **Index No. …….**

**School ……...** **Date……. …….**

**Sign……. …….**

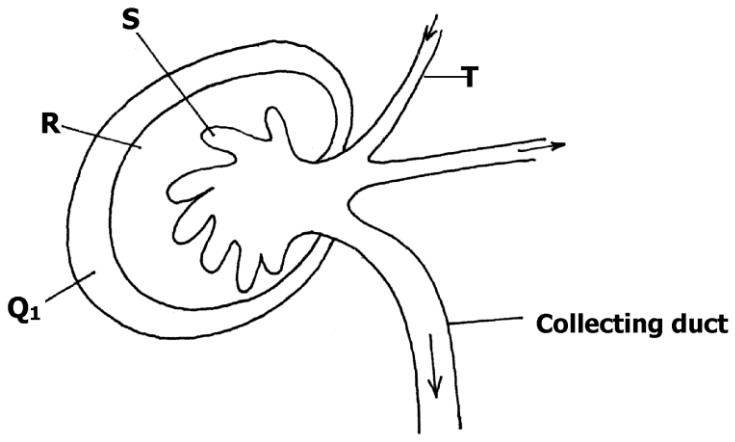
**231/2**
**BIOLOGY**
**PAPER 2**
**Time: 2 Hours**

**FOR EXAMINERS USE ONLY**

| SECTION | Questions | Maximum Score | Candidates Score |
|---|---|---|---|
| A | 1 | **8** | |
| | 2 | **8** | |
| | 3 | **8** | |
| | 4 | **8** | |
| | 5 | **8** | |
| B | 6 | **20** | |
| | 7 | **20** | |
| | 8 | **20** | |
| | **TOTAL SCORE** | **80** | |

***SECTION A 40 MARKS***

1. The diagram below is a longitudinal section of an organ in mammals




FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

a) Name the organ (1mk)

……

……

b) Identify the parts R and S (2mks)

……

……

c) i) State two differences in the structure above found in the deserted- rat and fish (3mks)

……

……

……

……

……

ii) Account for the difference stated above. (2mks)

……

……

……

……

……

d) Name the gland associated with the secretion of aldorsterone hormone. (1mk)

……

……

2. a) What is the economic importance of anaerobic respiration in industry. (3mks)

……

……

……

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……

……

b) Explain what happens in the two phases of aerobic respiration. (5mks)

……

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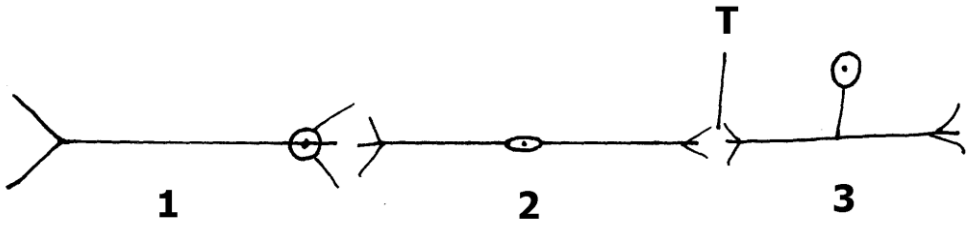
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3. The diagram below shows three different types of neurons along a reflex arc.




a) Identify the Neuron labeled 1,2 and 3. (3mks)

……

……

b) Using arrows show the direction of impulse transmission on the diagram. (1mk)

c) Name the part where the cell body of neurons 1 and 2 are located. (2mks)

……

……

……

……

d) Describe the transmission of impulses across the part labeled T.

……

……

……

……

4. In an experiment, a variety of garden peas have a smooth seed coat was crossed with a variety with a wrinkled seed coat. All the seeds obtained in the $F_1$, had a smooth seed coat

The $F_1$ generation was selfed. The total number of $F_2$ generation was 7324.

a) Using appropriate letter symbols in a punnet square, work out the genotypes of the F1 generation. (4mks)

b) From the information above, work out the following for the $F_2$ generation

(i) Genotypic ratio (2mks)

……

……

……

……

(ii) Phenotypic ratio (1mk)

……

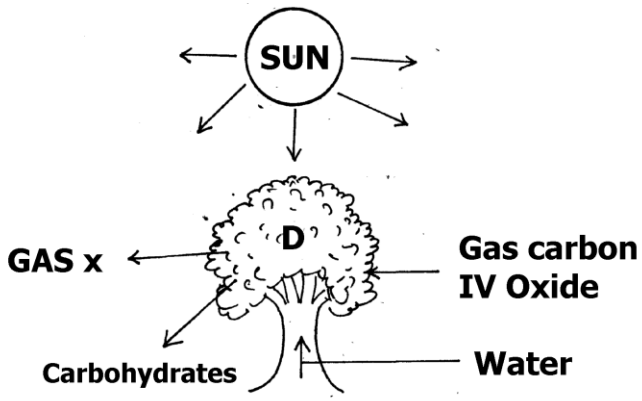
……

(iii) Wrinkled number (1mk)

……

……

5. The diagram below illustrate the first stage in the energy flow in the ecosystem



a) Identify (i) organelles responsible for activity in D.

(i) in D (1mk)

……

(ii) Gas X (1mk)

……

b) Suggest the roles played by each of the following in the process illustrated above.

i) Light energy (1mk)

……

……

ii) Water (1mk)

……

……

iii) Carbon (II) oxide (1mk)

……

……

c) Give three ways in which the carbohydrates produced in the organelles at D is utilized in the plants. (3mks)

……

……

……

……

……

……

***SECTION B: 40 MARKS***

6. The following data are results from an observation and measurement of daily growth in an organism over a period of 24 days of its development

a) Using a suitable scale draw graphs of width of head and length of femur against time on the same axis. (8mks)

| **DAY** | **WIDTH OF HEAD** | **LENGHT** |
|---|---|---|
| | **Mm** | **Femur (mm)** |
| 1 | 3.0 | 7.0 |
| 2 | 3.5 | 7.5 |
| 3 | 4.0 | 8.0 |
| 4 | 4.0 | 8.0 |
| 5 | 4.0 | 8.0 |
| 6 | 4.0 | 9.2 |
| 7 | 4.0 | 10.5 |
| 8 | 4.0 | 12.0 |
| 9 | 4.7 | 12.0 |
| 10 | 5.0 | 12.0 |
| 11 | 5.0 | 12.0 |
| 12 | 5.0 | 12.0 |
| 13 | 5.0 | 12.0 |
| 14 | 5.0 | 12.0 |
| 15 | 5.0 | 13.3 |
| 16 | 5.0 | 14.8 |
| 17 | 5.7 | 16.4 |
| 18 | 6.4 | 18.0 |
| 19 | 7.0 | 18.0 |
| 20 | 7.6 | 18.0 |
| 21 | 7.6 | 18.0 |
| 22 | 7.6 | 18.0 |
| 23 | 7.6 | 18.0 |
| 24. | 7.6 | 18.0 |

**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

b) i) Name the growth pattern represented by the graph. (1mk)

……

……

ii) With reference to your graph, identify the phylum to which the organism belongs. Give reasons for your answer. (2mks)

……

……

c) Account for the length of hind femur between

(i) day 3 and day 7 (2mks)

(ii) day 7 and day 10 (2mks)

d) State two hormones involved in the growth pattern represented by the graphs . (2mks)

……

……

e) State two advantages of metamorphosis in organisms. (2mks)

……

……

……

……

7. Explain how the various activities of man have caused air pollution. (20mks)

8. a) What are enzymes? (2mks)

b) State the properties of enzymes (6mks)

c) Discuss the factors that affect the rate of enzyme – catalysed reactions (12mks)

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# TRIAL 5

**NAME:……** **INDEX NO:……**

**SCHOOL:……..** **DATE:…….**

**SIGN:……..**

**231/1**
**BIOLOGY**
**PAPER I**
**(THEORY)**
**TIME: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES**

(a) Write your name and Index number in the spaces provided.
(b) Answer ALL questions in the spaces provided.

**FOR EXAMINERS USE ONLY.**

| QUESTIONS | MAXIMUM SCORE | CANDIDATES SCORE |
|---|---|---|
| 1 – 30 | 80 | |

**Answer all the questions in the spaces provided**

1. State two feature common in mammals and bird (2 marks)

.....

.....

.....

.....

2. Name the causal organism of the following diseases in humans; (2 marks)

a) Bilharzi

.....

.....

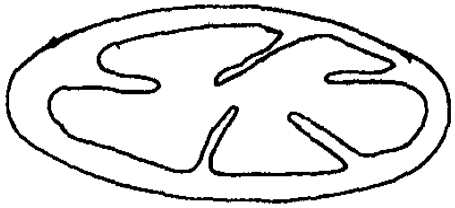
b) Syphilis

.....

.....

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

3. i) Identify the organelle shown below (1 mark)



.....

.....

ii) How is the organelle you have identified in a( 1) above suited to its function (2 marks)

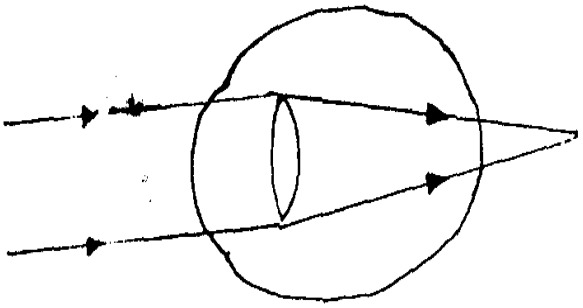
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.....

4 Use the diagram below to answer the questions that follow



i) Name the eye defect represented above (1 mark)

.....

.....

ii) What is the cause of this defect (1 mark)

.....

.....

iii) How can the defect you have named (a) (i) be corrected? (1 mark)

.....

.....

.....

5. Name the components of the blood that do not enter the renal tubule in mammals. (2 marks)

.....

.....

.....

6. Give two factors affecting the rate of respiration. (2 marks)

.....

.....

.....

7. State three structural differences between muscles alimentary canal and biceps muscles. (3 marks)

.....

.....

.....

.....

.....

.....

.....

8. a) Name the micro-organism found in the root nodules of legumes (1 mark)

.....

.....

.....

b) State the association of the micro-organisms named in (a) above (1 mark)

.....

.....

.....

c) What is the role of the micro-organism you named in (a) above. (1 mark)

.....

.....

.....

9. a) Name the stage in mitosis where chrornatids collect together at the two opposite ends of the spindle fibres. (1 mark)

.....

.....

.....

b) State two functions of centrioles (2 marks)

.....

.....

.....

10. a) State two functions of large intestines in man. (2 marks)

.....

.....

.....

b) Name the disease caused by lack of each of the following in human diet. (3 marks)

Vitamin D

.....

.....

Iodine

.....

.....

Iron

.....

.....

11. a) In a blood test, a few drops of anti-B serum were added to two samples of blood. It was noted that agglutination occurred. What were the possible blood groups of the two blood samples? (2 marks)

.....

.....

.....

b) Why would carboxyhaemoglobin lead to death? ( 2 marks)

.....

.....

.....

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

--S - - P - - S - - P - -S - - P - - S

C G U C

a) Giving a reason, name the nucleic acid to which the portion belongs. (2 marks)

Name

.....

.....

Reason

.....

.....

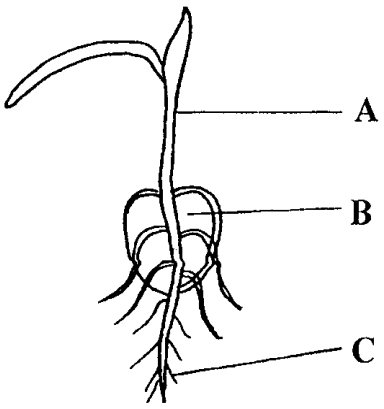
.....

b) Write down the sequence of bases of a complimentary strand to that (1 mark)

.....

.....

13. The diagram below represents a maize seedling.




a) Name the structure labeled A and C (2mks)

A

.....

.....

C

.....

.....

b) i) State the functions of parts labeled B and C (2 marks)

B

.....

.....

.....

C

.....

.....

.....

ii) Name the type of germination exhibited by maize. (1 mark)

.....

.....

14. What is meant by the following terms? (2 marks)

a) Carbon (IV) oxide fixation

.....

.....

.....

b) Compensation point

.....

.....

.....

15. a) State two ways in which floating leaves of aquatic plants are adapted to gaseous exchange (2 marks)

.....

.....

.....

b) Name two structures for gaseous exchange in aquatic plant. (2 marks)

.....

.....

.....

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

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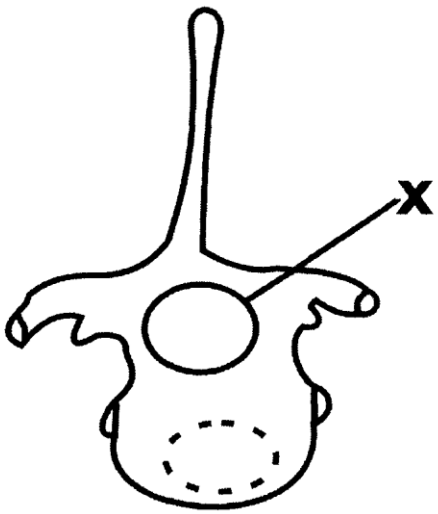
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.....

17. The diagram below shows a bone from a mammal.




a) Name the structure that passes through part labeled X. (1 mark)

.....

.....

b) What function does the vertebra provide for structure X (1 mark)

.....

.....

c) In which region of the vertebral column is:

i) The bone found? (1 mark)

.....

.....

ii) Give a reason for your answer in c (i) above. (1 mark)

.....

.....

1 8. a) Explain how the following parts of a mammalian reproductive system are adapted to their functions. (2 marks)

i) Testis

.....

.....

.....

ii) Uterus

.....

.....

.....

b) Explain why removal of the ovary after four months of pregnancy does not terminate pregnancy.

.....

.....

.....

19. State the role of the following hormones in homeostasis

i) Antidiuratic hormone (vasopressin) (1 mark)

.....

.....

.....

ii) Aldosterone hormone (1 mark)

.....

.....

.....

20. Distinguish between plasmolysis and haemolysis (2 marks)

.....

.....

.....

21 . Give two reasons why pressure of blood is greater in arteries than in the veins of mammals. (2 marks)

.....

.....

.....

22. a) What is meant by

i) Autecology (1 mark)

.....

.....

.....

ii) Synecology ( 1 mark)

.....

.....

.....

23. An organelle was magnified 800 times by an electron microscope. Its diameter was 2 millimetres. Calculate the actual diameter in micrometres. (2 marks)

24. Give two advantages of natural selection to organisms. (2 marks)

.....

.....

.....

.....

25. a) State two ways in which some fungi are harmful to man (2 marks)

.....

.....

.....

.....

b) List the main characteristics that are used to sub- divide arthropods into classes(2 marks)

. .....

.....

.....

.....

26. Euglena is positively phototactic. Of what biological significance is this characteristics (1 mark)

.....

.....

27. What is the role of the vascular bundles in plant nutrition? (3 marks)

.....

.....

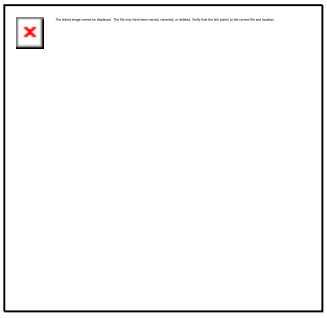
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28. Study the diagram below which shows part of a mammalian tooth and answer the questions that follow



a) With a reason, identify the tooth ( (2 marks)

Identity

.....

.....

.....

Reasorn

.....

.....

.....

b) State one adaptation of the tooth to its function (1 mark)

.....

.....

.....

29. a) What is co-dominance? (l mark)

.....

.....

.....

b) Name two disorders in human blood that are caused by gene mutation. (2 marks)

.....

.....

.....

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

.....

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# TRIAL 5

**Name……. Index No……/…….**

**School……Date ……..…**

**Candidate's Signature……**

**231/2**

**BILOGY**

**PAPER 2**

**Time: 2 Hours**

## SECTION A

– Answer all the questions in this section.

1. In an experiment to investigate the rate of reaction indicated by the equation.

$C_{12}H_{22}O_{11} \longrightarrow C_6H_{12}O_6 + C_6H_{12}O_6$

Sucrose Fructose Glucose

It was found out that for products fructose and glucose to form, substance "K" was needed. Temperature was maintained at 37ºC.When substance "L" was added, reaction slowed and then stopped.

(a) Suggest identity of the substances (2mks)

K

……

L

……

(b) Other than temperature, state <u>three</u> factures that increase the rate of reaction. (3mks)

……

……

……

(c) Explain how substance "L" slowed the rate of reaction. (2mks)

……

……

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

(d) What type of reaction is represented by the equation above? (1mk)

……

2. (a) Give the differences between the following structures in wind and insect pollinated flowers. (6mks)

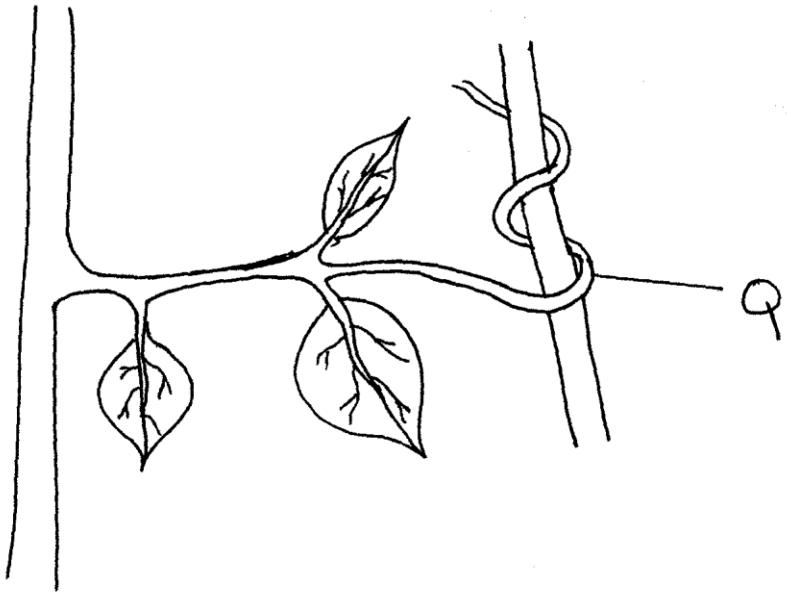
| Structure | Insect pollinated flower | Wind pollinated flower |
|---|---|---|
| (i)Anther | | |
| (ii)Stigma | | |
| (iii)Pollen grain | | |

(b) State two mechanisms that hinder self pollination in flowering plants

……

……

3. Study the diagram below and answer the questions that follows.




(a) Identify part labeled Q. (1mk)

……

(b) (i) What type of response is shown above? (1mk)

……

(ii) What is the importance of the above response? (1mk)

……

……

(c) Explain how the response exhibited by the part Q occurs. (4mks)

……

……

……

……

……

……

(d) Name the plant hormone that is responsible for this response. (1mk)

……

4. In a certain species of flies, the genotypes of pure breeds RR and rr, a cross was made between the two genotypes. When sprayed with an insecticides ,it was found that it would only kills flies of genotype rr.

(a) Perform a cross to show the results of a cross between two heterozygote flies. (3mks)

(b) What percentage of flies would be killed by the insecticides show your working. (2mks)

(c) Explain why the insecticides kills only flies of genotype rr. (2mks)

……

……

……

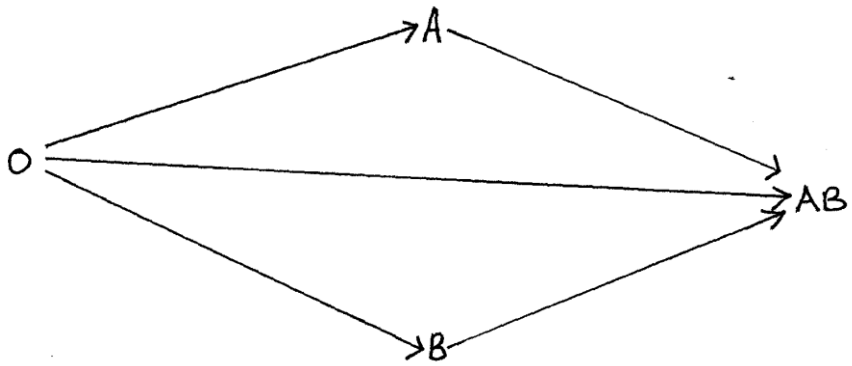
……

(d) What is an allele? (1mk)

……

……

5. The flow chart below shows blood transfusion pathway.




(a) What five conclusions can you draw from the above flow chart? (5mks)

……

……

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……

……

……

(b) Why is the knowledge of blood groups necessary before blood transfusion? (1mk)

……

……

(c) A part from knowledge of blood groups state two precautions that must be observed during blood transfusion. (2mks)

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SECTION B(40 MARKS)

Question 6 is compulsory. Then answer either 7 or 8.

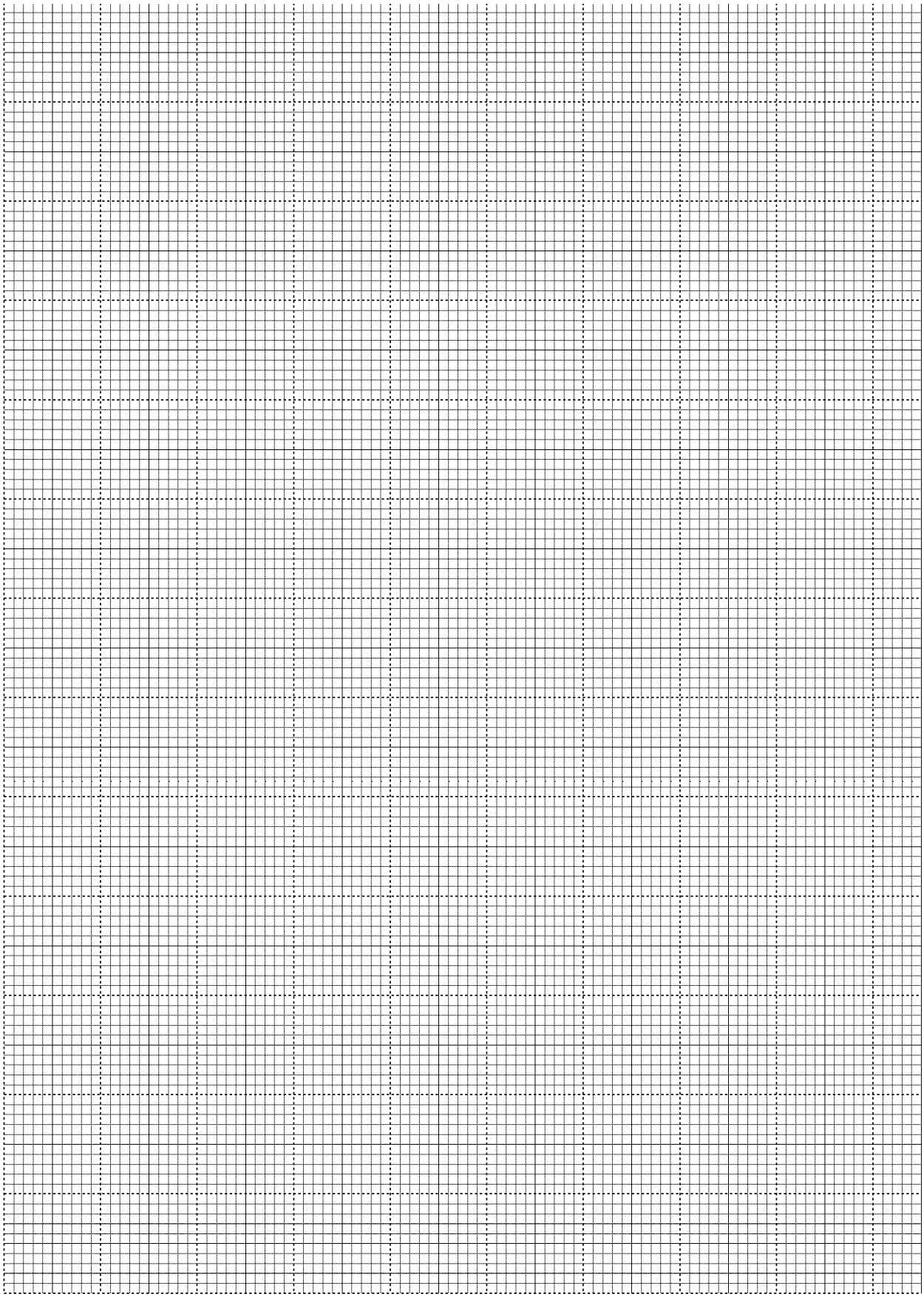
6. A person had gone for 24 hours without food. Then he was served with a well balanced meal after which the concentration of glucose and amino acids in the blood were determined every one hour for the next 8 hours after the meal, the concentration were measured as blood passed through the hepatic portal vein and hepatic vein.

The results were as shown in the data below.

| Time in hours | Concentration of Glucose & amino Acids in blood (Mg/100 $cm^3$ of blood) | | | |
|---|---|---|---|---|
| | HEPATIC PORTAL VEIN | | HEPAT IC VEIN | |
| | GLUCOSE | AMINO ACIDS | GLUCOSE | AMINO ACIDS |
| 0 | 79 | 1.0 | 85 | 1.0 |
| 1 | 79 | 1.0 | 85 | 1.0 |
| 2 | 160 | 1.0 | 110 | 1.0 |
| 3 | 140 | 4.0 | 100 | 3.0 |
| 4 | 120 | 6.0 | 90 | 3.0 |
| 5 | 100 | 5.0 | 90 | 2.0 |
| 6 | 90 | 2.0 | 90 | 1.0 |
| 7 | 90 | 1.0 | 90 | 1.0 |
| 8 | 90 | 1.0 | 90 | 1.0 |

(a) On the same axis plot graphs of glucose concentration in hepatic portal vein and hepatic vein against time. (7mks)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657



(b) Account for the difference in blood sugar level in hepatic portal vein and hepatic vein.

(i) Between 0-1 hours. (4mks)

……

……

……

……

(ii) Between 2-4 hours (5mks)

……

……

……

……

……

……

(c) (i) Give one reason that delayed increase in amino acids concentration in hepatic portal vein. (1mk)

……

……

(ii) Account for the difference in concentrations of amino acids in hepatic portal vein and hepatic vein between $3^{rd}$ -$6^{th}$ hours (2mks)

……

……

(d) Name the enzyme that completes fat digestion in man (1mk)

……

……

7. A student ate lean meat for break fast, Explain fully how the meal eventually becomes part of the body tissue. (20mks)

8. (a) With aid of a large labeled diagram describe the process of fertilization in a flowering plant. (14mks)

(b) How does the process above differ from that in Bryophytes. (6mks)

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# TRIAL 6

**Name……** **Index No……..**

**School……** **Candidate's sign…….**

**Date…….**

**231/1**
**BIOLOGY**
**Paper 1**
**2 Hours**

***Kenya Certificate of Secondary Education (K.C.S.E)***

| Questions | Max score | Candidates |
|---|---|---|
| 1-27 | 80 | |

***This paper consists of 2 printed pages. Candidates should check the question paper to Ensure that all the pages are printed as indicated and no questions are missing.***

1. State the function of the following cell organelle

   (a) Ribosome (3mks)

   ……

   ……

   (b) Smooth endoplasmic reticulum

   ……

   ……

   (c) Golgi apparatus

   ……

   ……

2. List any distinguishing features of the class arachnida (2mks)

   ……

   ……

3. (a) (i) Name the hormone responsible for moulting in insects (1mk)

   ……

   (ii) Where is the hormone in a(i) above secreted

   ……

   ……

   (b) State the role of juvenile hormone in the development of insect (1mk)

**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

……

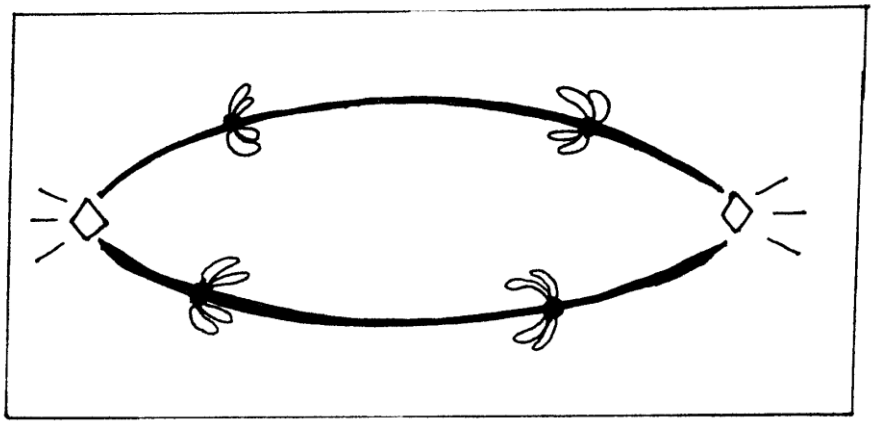
4. State three functions of the mammalian blood other than transport (3mks)

……

……

……

5. Below is a stage in cell division



(a) Identify the stage (1mk)

……

(b) Give reasons for your answer (2mks)

……

……

6. Industrial wastes may contain metallic pollutants. State how such pollutants may indirectly reach and accumulate in the human body if the wastes were dumped into rivers. (3mks)

……

……

……

……

7. Name parts of the brain which control

(a) Involuntary activities e.g breathing (1mk)

……

(b) Control voluntary body movement (1mk)

……

8. During a strenuous exercise, the chemical process represented by the equation below takes place in human muscles

$C_6H_{12}O_6 \longrightarrow 2CH_3CH(OH)COOH+150KJ$

(Glucose) (substance x) (energy)

(a) What is the name of this process (1mk)

……

(b) Name the substance X (1mk)

……

(c) What happens to the muscle if x accumulates to critical level (1mks)

……

9. (a) What is meant by (a) organic evolution (1mk)

……

……

(b) Adaptive radiation (1mk)

……

……

10. Identify the type of mutation represented by the following pairs of words

(i) Shirt instead of skirt (1mk)

……

(ii) Hopping instead of shopping (1mk)

……

(iii) Eat instead of tea (1mk)

……

11. State the function of the following in reproduction

(a) Umbilical cord (3mks)

……

……

(b) Aerosome

……

……

(c) Follical stimulating hormone

……

……

12. (a) Explain why a person discharges urine more frequently when environment temperatures are low than when they are high. (2mks)

……

……

……

(b) Name the nitrogenous wastes excreted by a fresh water fish (1mks)

……

13. Explain why individuals with smaller sizes requires more energy per kg of body weight than those with large sizes (3mks)

……

……

……

……

14. List three types of muscles (3mks)

……

……

……

15. Describe the path taken by carbon (iv) oxide released from the tissues of a cockroach into the atmosphere (3mks)

……

……

……

……

16. Name the blood vessels that transport blood from (3mks)

(a) Small intestines to the liver…….

(b) Heart to the kidney……..

(c) Heart to the lungs…….

17. 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 |

(a) Suggest the possible habitat of the plant from which the leaves were obtained

Leaves Habitat

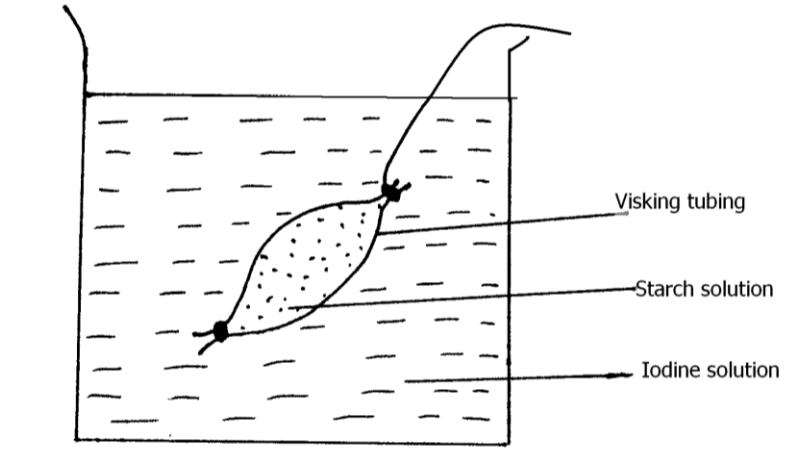
A ……..

B ……..

(b) State one modification found in the stomata of leaf C (1mk)

……

18.




The set-up above was prepared by form one students and left for 1 hour

They made the following observations

| | At the start | After one hour |
|---|---|---|
| In visking tubing | White solution | Blue-black |
| In beaker | brown | brown |

(a) Identify the physiological process being investigated (1mk)

……

(b) Explain the observation made (3mks)

……

……

……

19. In a field study a student came across a plant whose leaves quickly folded when touched, he gave the name as Mimosa Pudica

(a) Identify the mistake he made when writing the scientific name (2mks)

……

(b) Name the type of response (1mk)

……

(c) State the possible advantage of this response to the plant. (1mk)

……

20. State three characteristics features of an efficient respiratory surface (3mks)

……

……

……

21. State three environmental factors that affect the rate of stomatal transpiration (3mks)

……

……

……

22. (a) What is the importance of Adenosine triphosphate (ATP) in mammals (1mk)

……

(b) State two functions of respiratory Quotient (RQ) (2mks)

……

……

23. Give two functions of the exoskeleton in insects (2mks)

……

……

24. State four ways of breaking seed dormancy (4mks)

……

……

……

……

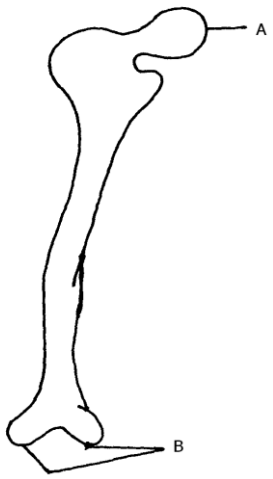
25. Other than sexual intercourse name the other ways by which HIV/AIDS is spread (3mks)

……

……

……

26. The diagram below represents a bone in a mammal




(a) Identify the bone (1mk)

……

(b) Name the bone that articulate with the above bone at part A (1mk)

……

(c) Name the joint formed at the part labeled B (3mks)

……

……

……

27. An animal has the following dental formula,

1=0/2 C=0/2 pm 3/3 m=2/3

(a) Suggest the type of diet for this animal (1mk)

……

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

……

(c) How many teeth does the animal have in total (1mk)

……

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# TRIAL 6

**Name……** **Index No……..**

**School…….** **Date…….**

**Candidate's signature……..**

**231/2**
**BIOLOGY**
**Paper 2**
**Time 2Hours**

**FOR EXAMINER USE ONLY.**

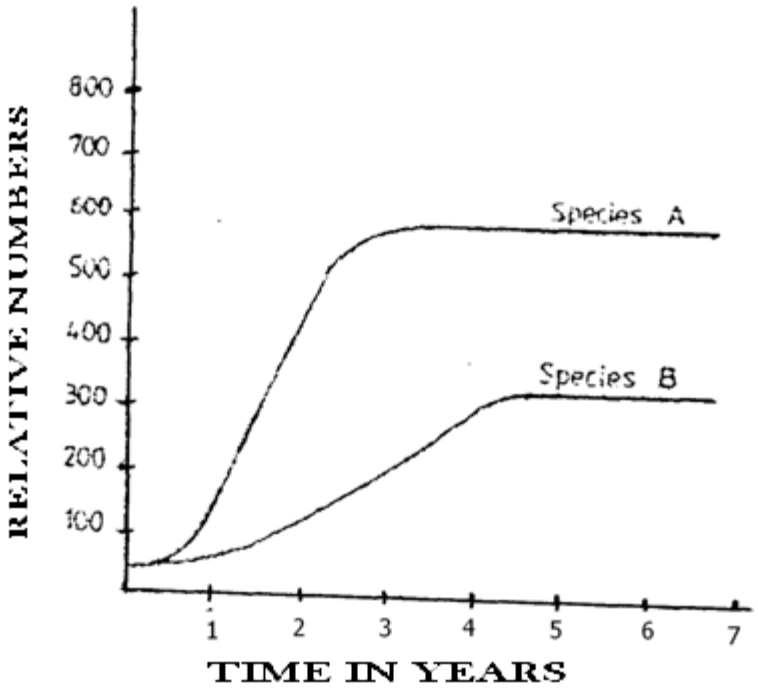
| SECTION | QUESTIONS | MAXIMUM SCORE | CANDIDATE'S SCORE |
|---|---|---|---|
| A | 1<br>2<br>3<br>4<br>5 | 08<br>08<br>08<br>08<br>08 | |
| B | 6<br>7<br>8 | 20<br>20<br>20 | |
| TOTAL SCORE | | 80 | |

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

## SECTION A (40 MARKS)
**Answer All questions in this section**

1. Two herbivorous mammalian species were introduced into an ecosystem at the same time and iin equal numbers. The graph below represents their populations during the first seven years. Study the graph and answer the questions that follow.

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657




a) i) Which species has a better competitive ability? (1 mark)

.....

.....

ii) Give reason for your answer (l mark)

.....

.....

.....

b) Account for the shape of the curve of species A between

i) One year and three years (2 marks)

.....

.....

.....

.....

ii) Three years and seven year (2 marks)

.....

.....

.....

c) A natural predator for species A was introduced into the ecosystem.

With a reason state how the population of each species will be affected (2 marks)

.....

.....

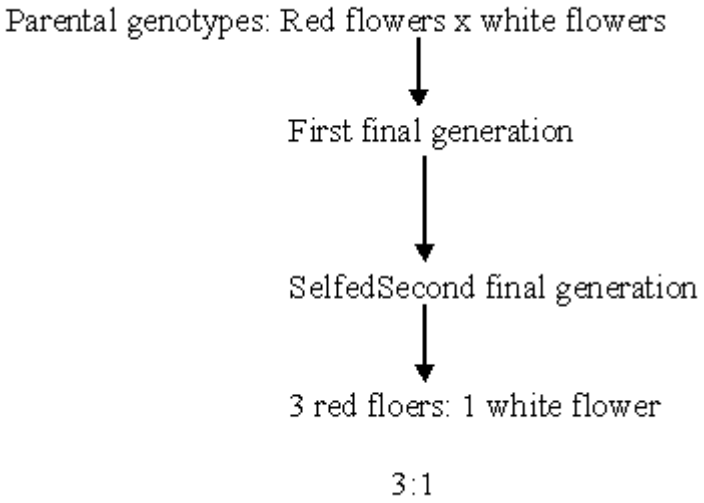
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2 The chart below represents the result of successive crosses, staring with red flowered plants and white flowered plants in which both plants are pure breeding




a) What were parental genotype ? Use letter R to represent the gene for red colour and r for white colour ( l mark)

.....

.....

.....

b) i) What was the colour of the flowers in the first filial generation? ( l mark)

.....

.....

.....

ii) Give a reason for your answer in b (i) above (l mark)

.....

.....

.....

c) lf 480 red flowered plants were obtained in the second filial generation, how many F2 plants had white flowers? Show your working (5 marks)

3. A form 1 student placed a red blood cell in a solution and made an observation as follows.
Start of experiment/ end of experiment

a) i) In what solution was the red blood cell paced? (l mark)

.....

.....

.....

ii) Explain the observation above (2 marks).

.....

.....

.....

.....

b) If the red blood cell was replaced by a plant cell what would be the observation (2 marks)

.....

.....

.....

c) Why don't the red blood cell undergo the same changes as above while in the body.

(3 marks)

.....

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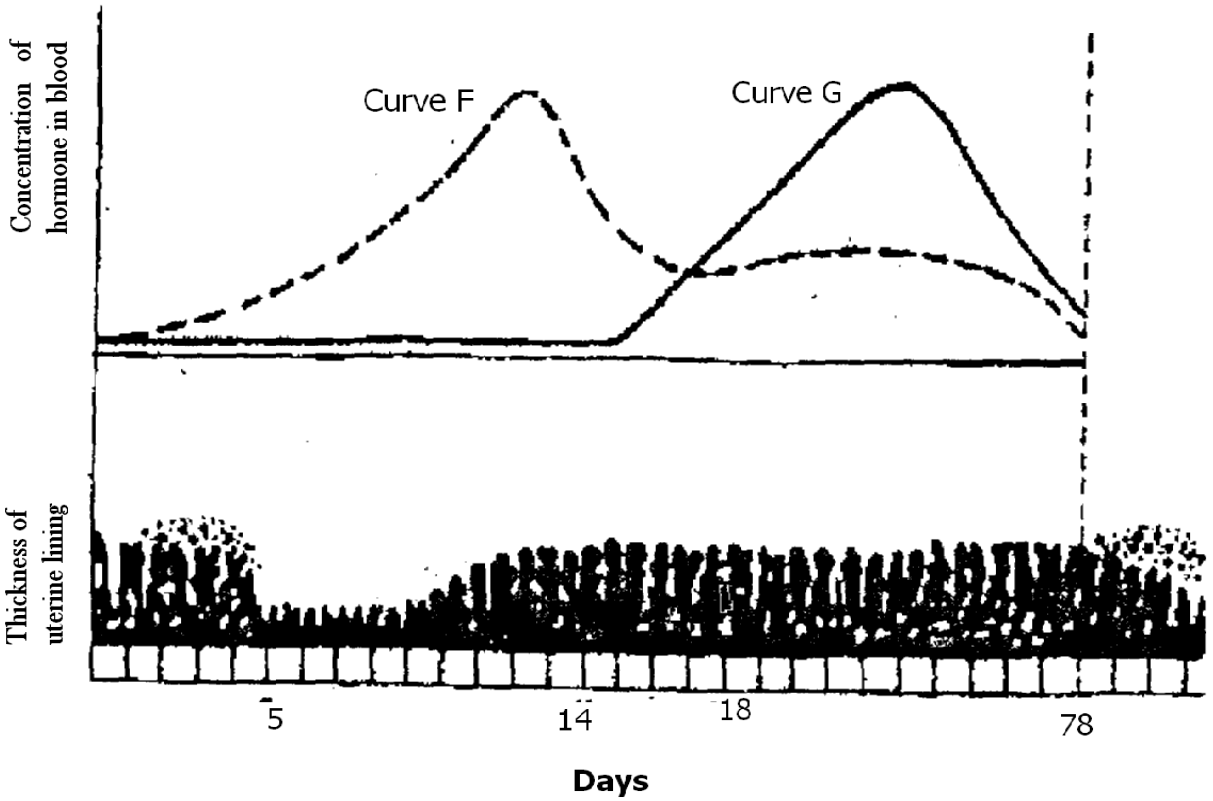
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4. The figure shows changes that take place during menstrual cycle in human




a) Name the hormone whose concentrations are represented by curves F and G (2 marks)

.....

.....

.....

b) State the effects of the hormones named in (a) above on the lining of the uterus (2 marks)

.....

.....

.....

.....

.....

c) i) Name the hormone which is released by the pituitary gland in high concentration on the 14th day of the menstrual cycle (l mark)

.....

.....

.....

ii) State two functions of the hormone named in (c) (i) above (2 marks)

.....

.....

.....

. .....

.....

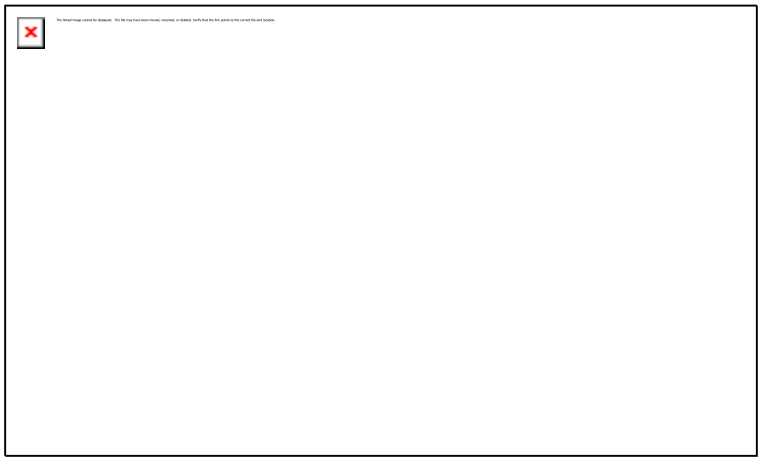
d) State the fertile period during the menstrual cycle ( 1 mark)

.....

.....

.....

5. The diagram below represents a bone obtained from a mammal



a) Name the bone ( 1 mark)

.....

.....

.....

b) Name the:

i) Bone which articulate with the bone named in (a) above at the cavity labeled K;

( 1 mark)

.....

.....

.....

ii) Joint formed by the two bones (1 mark)

.....

.....

.....

c) State the function of the part labeled J

.....

.....

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.....

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.....

d) Explain how the pelvic girdle is adopted to its function (4 marks)

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**Section B**

**Answer question six in the spaces provided and either question 7 or 8 in the spaces provided after question8**

6. An experiment was carried out to investigate the nutritional value of two dry powder animals feeds X and Y over a period of six months. Twenty 5 month's old castrated goats were use. The goats were divided into two equal groups A and B.

The animal's in group A were fed on feed X throughout the experiment while those of group B were fed on feed Y.

The feeds were supplemented with dry hay and water. The average body weight of each group of goats and the weight of the dry powder feeds were determined and recorded each month. The faeces produced by each group was dried and weighed and the average dry faecal output per month was also recorded. The results are as shown below.

| | GROUP | A | | GROUP | B | |
|---|---|---|---|---|---|---|
| Months since commencement of the experiment | Average total weight of goats(Kg) | Average weight of total feed(Kg) | Average monthly dry faecal output(Kg) | Average total weight of goats(Kg) | Average weight of total feed(Kg) | Average monthly dry faecal output(Kg) |
| 0 | 20.4 | 26.7 | 10.5 | 20.5 | 35.4 | 16.5 |
| 1 | 22.5 | 27.5 | 10.7 | 19.5 | 34.3 | 17.7 |
| 2 | 24.5 | 25.8 | 10.3 | 19.0 | 35.2 | 17.2 |
| 3 | 26.3 | 18.5 | 8.8 | 18.5 | 36.1 | 17.5 |
| 4 | 28.0 | 16.6 | 7.2 | 17.1 | 36.0 | 16.9 |
| 5 | 29.4 | 16.3 | 6.0 | 16.3 | 35.8 | 16.8 |
| 6 | 29.5 | 16.1 | 5.6 | 15.6 | 35.5 | 16.6 |

a) i) What is the relationship between the amount of feed and the faecal output(2 marks)

.....

.....

.....

ii) Work out the average increase in weight for the animal's in group A during:

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

The first four months

.....

.....

.....

The last two months

. .....

.....

.....

(4 marks)

iii) Account for the average increase weight in goats in group A during:

The first four months

.....

.....

.....

The last two months

.....

.....

.....

(4 marks)

iv) Which of the two feeds is more nutritious? Give reason for your answer

(2 marks)

.....

.....

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.....

b) Explain the digestion of lipids in humans (8 marks)

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7 a) Describe how semicircular canals perform their functions (8 marks)

b) Describe how the cervical, lumbar and sacral vertebrae are suited to their functions (l2 marks)

8 a) State four characteristics of gaseous exchange surfaces. (4 marks)

b) Explain the theories for opening and closing of the stomata (16 marks)

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# TRIAL 7

**NAME:……** **INDEX NO:……**

**SCHOOL:……..** **DATE:…….**

**SIGN:……..**

**231/1**
**BIOLOGY**
**PAPER 1**
**(THEORY)**
**TIME: 2 HOURS**

**FOR EXAMINERS USE ONLY.**

| SECTION | QUESTIONS | MAXIMUM SCORE | CANDIDATE'S SCORE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

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

1. Name the causative agent of the following diseases in man (2mks)

   (a) candidansis

   .....

   (b) Syphilis

   .....

2. A student observed an organelle using an electron microscope at magnification of X600.Its diameter has 2 millimeters. Calculate the actual diameter of the organelle in micrometers. (2mks)

3. State two ways by which lactic acid formed in the muscles of an athlete is removed (2mks)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

.....

.....

4. (a) Name the blood vessels that connect arteries to veins (1mk)

.....

(b) Explain three ways in which the vessels named in (a) above are adapted to carry out their function. (3mks)

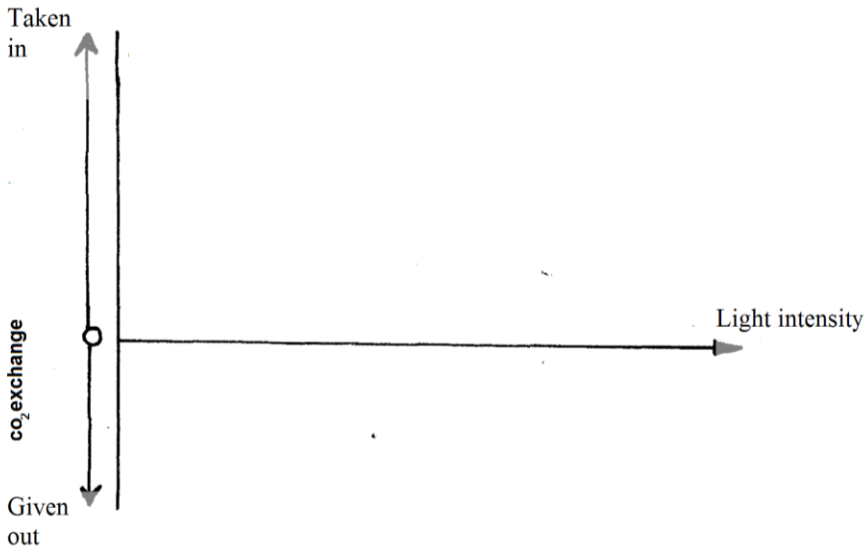
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.....

5. The figure below shows the effect of light intensity on the exchange of carbon (IV) oxide between a plant leaf and the atmospheric air.




(a) What name is given to point X? (1mk)

.....

.....

(b) Name two physiological processes in which carbon (IV) oxide is involved at point X (2mks)

.....

.....

6. State where each of the following is found in the human skeleton (2mks)

(a) Olecranan

.....

(b) Glenoid cavity

.....

7. Explain why people living at high altitude have higher concentration of red blood cells and haemoglobin than people who live at lower altitude (2mks)

.....

.....

.....

.....

8. State the survival valve of ;

(a) Negative phototaxis in fly larvae (2mks)

.....

(b) Thigmotropism (1mk)

.....

9. Using the symbol 'B' for black for allele in mice and 'D' for grey coloured for allele, write down the genotype of a mouse that is:

(a) Heterozygous for colour

.....

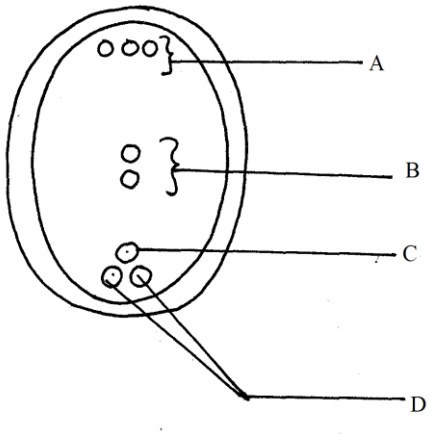
.....

(b) Homozygous recessive

.....

.....

10. The diagram below shows a mature embryo sac of a flowering plant




(a) Name the parts labelled (3mks)

(i) A. .....

(ii) D. .....

(b) What is the function of structures labelled B? (1mk)

.....

11. (a) State two ways in which the human body is naturally protected against harmful bacteria (2mks)

.....

.....

(b) State one way in which the composition of blood in the pulmonary artery and that in pulmonary vein (1mk)

.....

12. Describe how the following parts of the mammalian ear are adapted to their functions

(a) Pinna

.....

.....

(b) Tympanic membrane

.....

.....

13. State the necessity of support in plants (3mks)

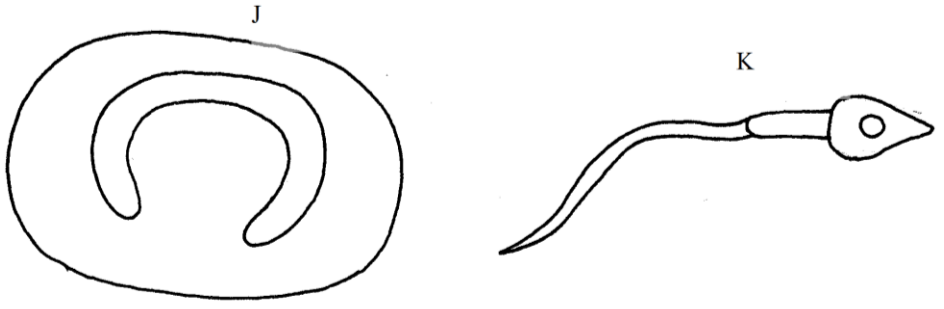
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14. Below are diagrams of specialised cells in mammals



(a) Identify each of the cells (2mks)

(i) J. .....

(ii) K .....

(b) Explain how cell specialization has enabled cell K to be effective in its functions (2mks)

.....

.....

15. (a) State one similarity between diffusion and osmosis (1mk)

.....

.....

(b) State two roles of active transport in higher plants (2mks)

.....

.....

16. (a) Alight microscope is an important apparatus in a laboratory. State two precautions which should be taken when storing (2mks)

.....

.....

(b) State functions of the following parts on a microscope (2mks)

(i) Fine adjustment knob

.....

.....

(ii) Condenser

.....

.....

17. (a) Name the hormone responsible for moulting in insect (1mk)

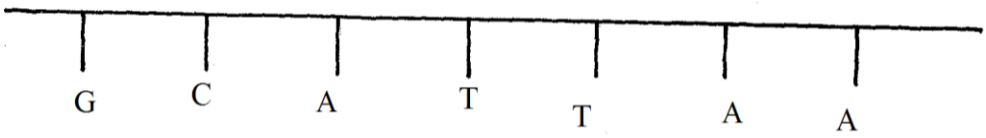
.....

(b) Where is the hormone named in (a) above secreted in insects (1mk)

.....

18. The figure below represents a section of a certain nucleic acid

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(a) (i) Identify the type of nucleic acid from which this strand was obtained. (1mk)

.....

(ii) Give a reason for your answer in a (i) above (1mk)

.....

.....

(b) State two structural differences between the RNA and DNA (2mks)

.....

.....

19. What assumptions are made while using capture and recapture method in estimating population (2mks)

.....

.....

.....

.....

20. A count for osmoregulatory changes that would take place in a marine amoeba if it was transfered to a fresh water environment (3mks)

.....

.....

.....

.....

.....

21. (a) What is metamorphosis (1mk)

.....

.....

(b) What is the biological importance of the larval stage during metamorphosis (2mks)

.....

.....

22. A solution of sugar cane was boiled with dilute hydrochloric acid. Sodium hydrogen carbonate was added and then heated with Benedicts' solution .An orange precipitate was formed

(a) Why was the solution boiled with dilute hydrochloric acid (2mks)

.....

.....

.....

.....

(b) To which class of carbohydrates does sugar cane belong? (1mk)

.....

23. (a) What is organic evolution (1mk)

.....

.....

(b) State two ways through which fossils serve as evidence for organic evolution (2mks)

.....

.....

24. (a) State the advantage of desert animals excreting their nitrogenous waste in form of urea and not ammonia (3mks)

.....

.....

.....

.....

.....

.....

(b) State two modifications on the kidney nepron of desert mammals (2mks)

.....

.....

25. Consider the characteristics of the following organisms: bee, tick, lobster, cockroach, millipede, moth and mosquito.

(a) Give the name of the phylum to which all these organisms belong. (1mk)

.....

(b) State three distinctive features of members of the phylum named in (a) above (3mks)

.....

.....

.....

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

(a) Hairs on the leaf

.....

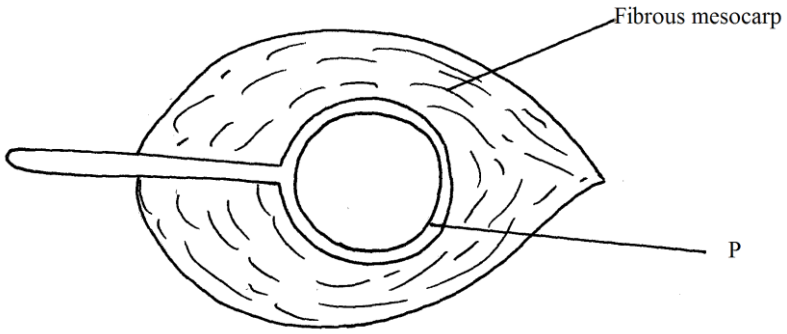
.....

(b) Folding of the leaf

.....

.....

27. The diagram below represents a longitudinal section of a fruit




(a) Name structures labelled P (1mk)

.....

(b) Describe two adaptations of the fruit for its mode of dispersal (3mks)

(i) Mode of dispersal

.....

.....

(ii) Adaptation

.....

.....

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# TRIAL 7

**Name……** **Index No……..**

**School……** **Candidate's sign…….**

**Date…….**

**231/2**
**BIOLOGY**
**Paper 2**
**(THEORY)**
**2 Hours**

**For examiners use only:**

| SECTION | QUESTION | MAX.SCORE | CANDIDATES SCORE |
|---|---|---|---|
| A | 1<br>2<br>3<br>4<br>5 | 8<br>8<br>8<br>8<br>8 | |
| B | 6<br>7<br>8 | 20<br>20<br>20 | |
| TOTAL | | 80 | |

***This paper consists of 2 printed pages. Candidates should check the question paper to Ensure that all the pages are printed as indicated and no questions are missing.***

**SECTION A (4OMKS)**

**Answer ALL the questions in this section in the spaces provided.**

1. ( a) Define

i) Osmosis (lmk)

……

……

……

ii) Haemolysis (lmk)

……

……

……

(b) State the role of active transport in plants. (2mks)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

……

……

……

(c) Why is oxygen important in the process of active transport? (lmk)

……

……

……

(d) State three properties of the cell membrane (3mks)

……

……

……

2. In a family with four children, three were found to have normal skin pigmentation while one was an albino. Using letter A to represent gene for normal skin pigmentation and a to represent the gene for albinism.

(a) What are the genotypes of the parents? (2mks)

……

……

……

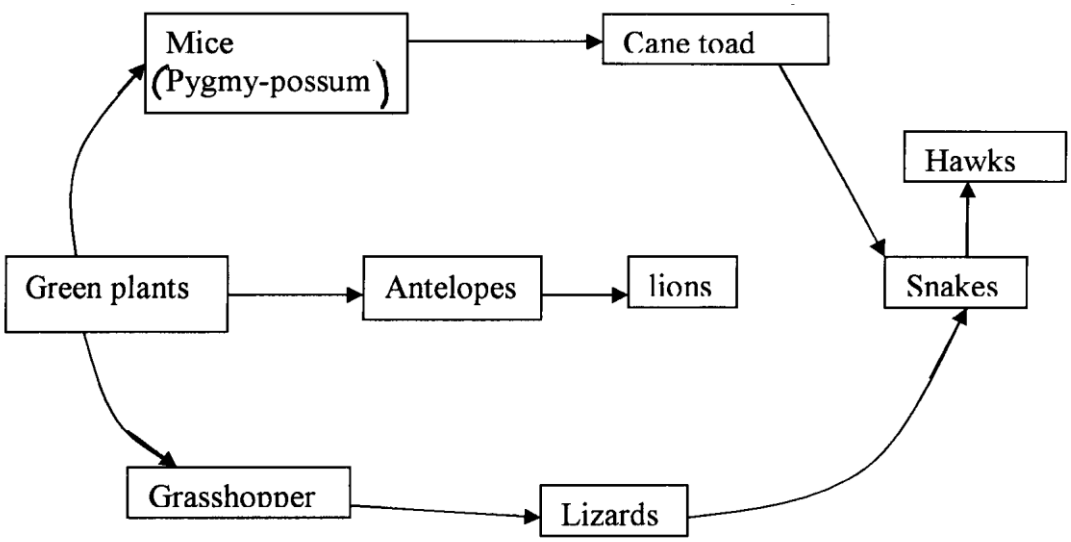
(b) Work out the genotypes of the normal pigmented children and the albino child (5mks)

(c) What is the probability that the fifth child will be an albino? (lmk)

……

……

3. The diagram below represents a food web in a terrestrial ecosystem.




(a) Which organism has the highest number of preys (lmk)

……

(b) Construct food chains with snakes as tertiary consumers (2mks)

……

……

……

(c) State the trophic level occupied by hawks in the food chains constructed in b) above (lmk)

……

……

(d) Describe how capture — recapture method can be used in estimating the population of fishes in a lake. (4mks)

……

……

……

……

……

……

4. (a) Differentiate between the mode of fertilization in higher plants and in mammals (2mks)

……

……

……

(b) Explain the role of the following hormones in the female menstrual cycle

(i) Oestrogen (2mks)

……

……

……

(ii) Luteinizing hormone (2mks)

……

……

……

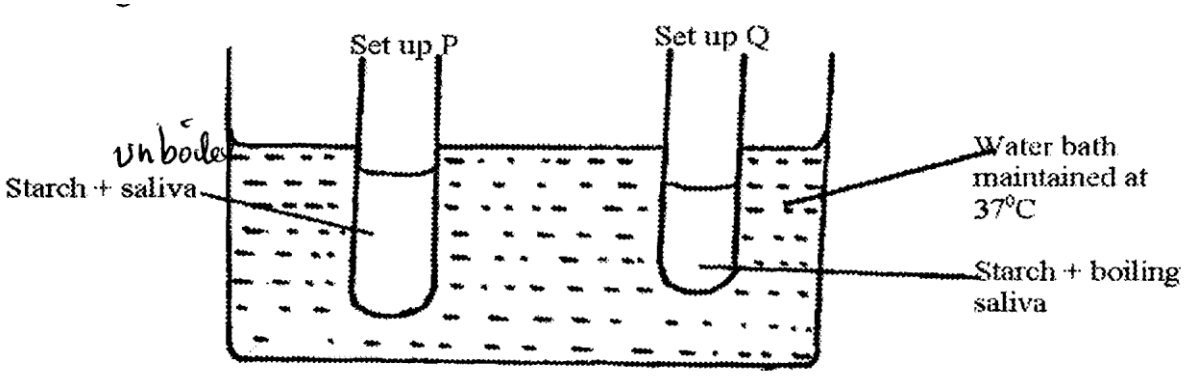
(c) Give two functions of the placenta during pregnancy (2mks)

……

……

……

5. In an experiment to investigate an aspect of digestion, two test tubes P and Q were set up as show in the diagram below.




The test tubes were left in the bath for 30 minutes. The content of each test tube was then tested for starch using iodine solution.

(a) What was the aim of experiment? (lmk)

……

……

……

(b) What results were expected in test tube P and Q (2mks)

P…….

Q……..

(c) Account for the results you have given in b above in test tube P and Q (2mks)

P

……

……

……

Q

……

……

……

(d) Why was the set up left at 37°C (1 mk)

……

……

……

(e) Name the carbohydrate stored in (2mks)

i. Mammalian liver

……

ii. Potato tuber

……

**SECTION B**

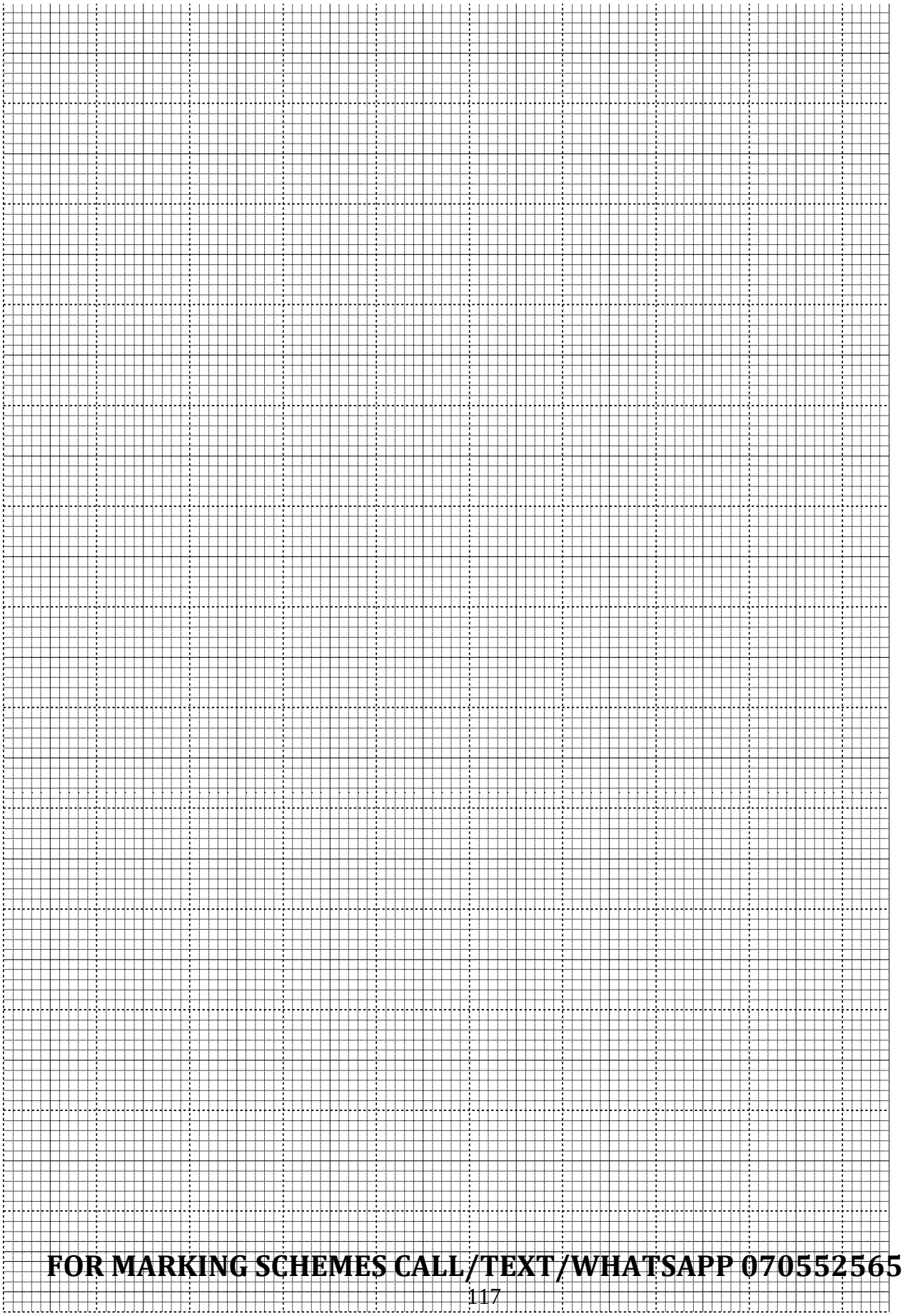
**Answer question 6 (Compulsory) and either question 7 or 8**

6. Two sets of a pea seeds were germinated, set A was placed in normal daylight conditions in the laboratory while set B was placed in a dark cupboard. Starting a few days later the shoots lengths were measured twice daily and their mean lengths recorded as shown in the table below.

| Time in hours | 0 | 12 | 24 | 36 | 48 | 60 | 72 | 84 |
|---|---|---|---|---|---|---|---|---|
| Set A length (mm) | 12 | 14 | 20 | 23 | 28 | 31 | 47 | 54 |
| Set B length (mm) | 17 | 23 | 28 | 35 | 48 | 62 | 80 | 94 |

(a) Using suitable scale draw the graphs of the mean lengths in set A and B against time.

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FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

(b) From the graph state the mean shoot length of each set of seedling at the 66th hour (2mks)

……

……

(c) Account for the difference of curve B and A (3 mks)

……

……

……

……

(d) Explain what would happen to set up B if it were allowed to continue to grow under conditions of darkness (4mks)

……

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(e) State three external conditions which should be constant for both set ups (3mks)

……

……

……

7. (a) What is reflex action (lmk)

(b) Describe what happens in the nervous system of a person who withdraws a finger from a very hot object. (14mks)

(c) Explain what happens to a young growing seedling when exposed to unidirectional source of light. (5mks)

8. (a) Outline the characteristics of the meristematic tissues. (5mks)

(b) Explain how different meristematic tissues contribute to growth higher plants. (l5mks)

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# TRIAL 8

**NAME: ……ADM NO: ……**

**SCHOOL: ……STREAM: ……**

**INDEX NO: ……**

**231/1**
**BIOLOGY**
**Paper 1**
**2 HOURS**

1. Define the following branches of Biology. (2 marks)
   i) Genetics
   ……
   ……

   ii) Entomology
   ……
   ……

2. State three reasons that necessitate classification of living organisms by taxonomists. (3 marks)
   ……
   ……
   ……
   ……
   ……
   ……

3. Define resolving power of a microscope. (1 mark)
   ……
   ……

4. State two functions played by the cell wall in plant cells and give the adaptation of the cell wall to performing each of the stated functions. (4 marks)

| Function | Adaptation |
|---|---|
| i) | |

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

| | |
|---|---|
| ii) | |

5. The cells of a certain herbaceous plant were found to have a diameter of 25µm. The cells were placed in varying concentrations of sugar solution. The average diameter of the cells in each solution was determined and the results obtained were as shown in the table below.

| Concentration of sugar solution (%) | Diameter of cells (µm) |
|---|---|
| 1 | 50 |
| 5 | 40 |
| 10 | 30 |
| 15 | 20 |

a) From the results determine the concentration of the cell sap. (1 mark)

……

……

b) Give an explanation for the average diameter of the cells placed in 15% sugar solution (3 marks)

……

……

……

……

c) Name the process that occurred in the cells which were place din 1% sugar solution. (1 mark)

……

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6. (a) Name two defects of the circulatory system in humans. (2 marks)

……

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(b) State three functions of blood other than transport. (3 marks)

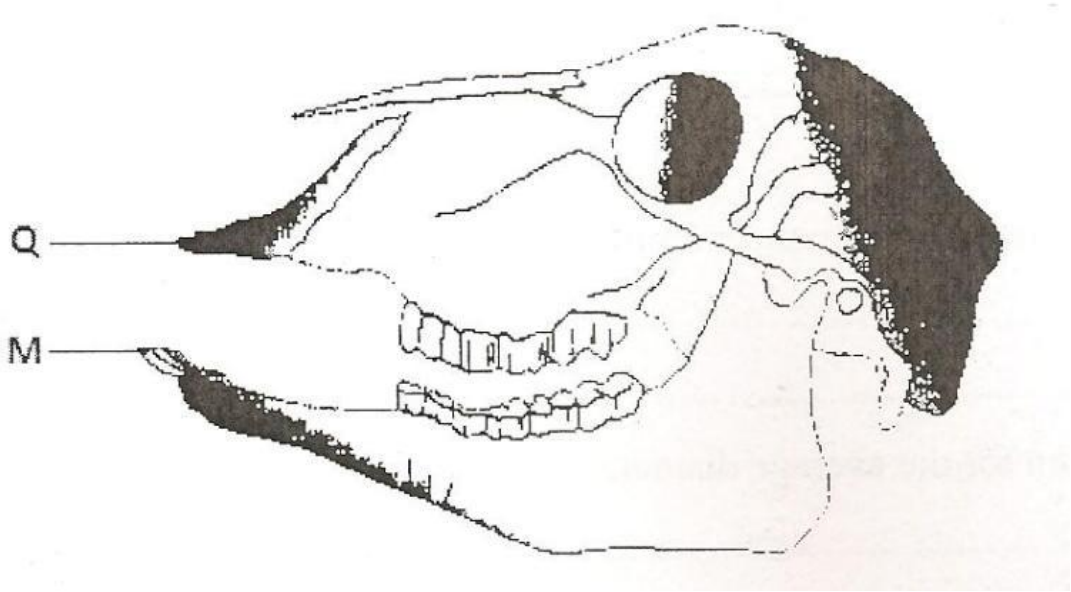
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7. The following specimens were extracted from a newly discovered organism.




a) Name the tooth labeled M. (1 mark)

……

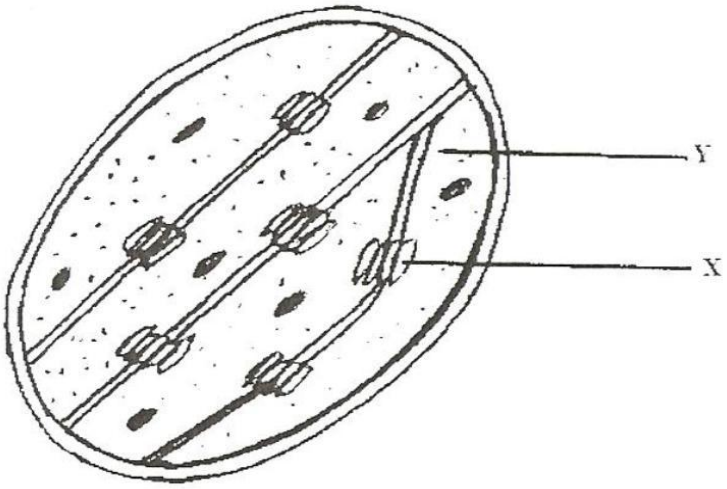
……

b) Name the part labeled Q and state its role. (2 marks)

Name: ……

Role: ……..

8. The diagram below represents a cell organelle




a) Name the part labeled Y (1 mark)

……

b) State the function of the part labeled X (1 mark)

……

……

9. (a) In what form is energy stored in muscles? (1 mark)

……

……

(b) State the economic importance of anaerobic respiration in plants. (2 marks)

……

……

……

……

10. (a) Name two gaseous exchange surfaces in plants. (2 marks)

……

……

(b) How are gaseous exchange surfaces in animals adapted to performing their function?

(2 marks)

……

……

……

……

11. What is the importance of counter flow system in fish? (2 marks)

……

……

……

……

12. State two structural modifications of the kidneys of desert animals like the kangaroo rat.

(2 marks)

……

……

……

……

13. (a) Name the fluid that is produced by sebaceous glands. (1 mark)

……

……

(b) What is the role of sweat on the human skin? (2 marks)

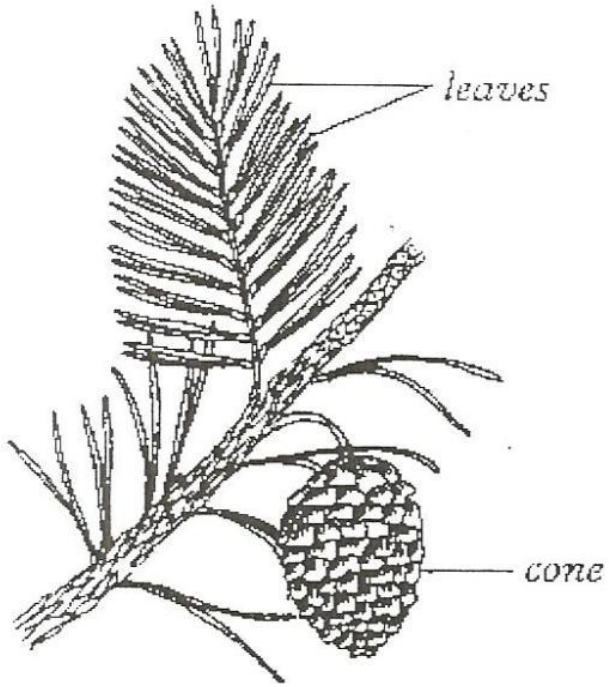
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14. The diagram below represents a certain plant species.




a) State the class to which the plant belongs. (1 mark)

……

……

b) State the difference between members of Gymnospermaphyta and Atngiospermaphyta (2 marks)

15. Give two reasons why a spider is classified under Phylum Arthropoda. (2 marks)

……

……

……

……

16. (a) Define the following terms as used in ecology. (2 marks)

i) Population

……

……

ii) Autecology

……

……

(b) From three students wanted to estimate the population of grasshoppers in $5km^2$ grass field near a school compound. They captured 36 grasshoppers and marked them before returning them back to the field. After two days they made another catch of grasshoppers. They collected 45 grasshoppers of which only 4 had marks.

i) State why the second capture was done after two days. (1 mark)

……

……

ii) From the data calculate the population size of grasshoppers in the grass field.

(2 marks)

……

……

17. In mitosis in animals chromatids failed to separate and move to opposite poles

a) Name the organelle that the cell was lacking (1 mark)

……

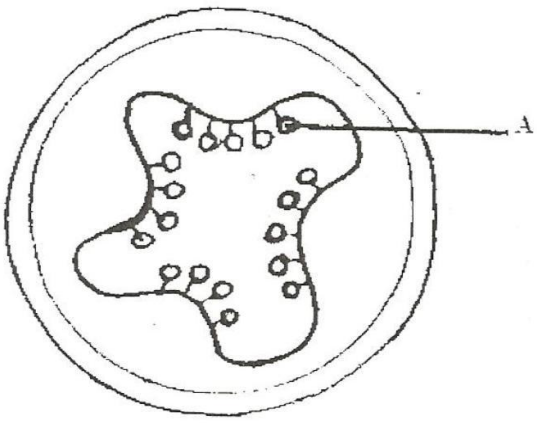
……

b) Name two regions in plants where cells actively undergo mitosis (2 marks)

……

……

18. The diagram below represents a transverse section of an ovary from a certain flower.




FOR MARKINC ['SAPP 0705525657

a) Name the structure labeled A. (1 mark)

……

……

b) Name the type of placentation illustrated in this diagram. (1 mark)

……

……

19. (a) State the functions of the following parts (2 marks)

i) Endometrium

……

……

ii) Epididymis

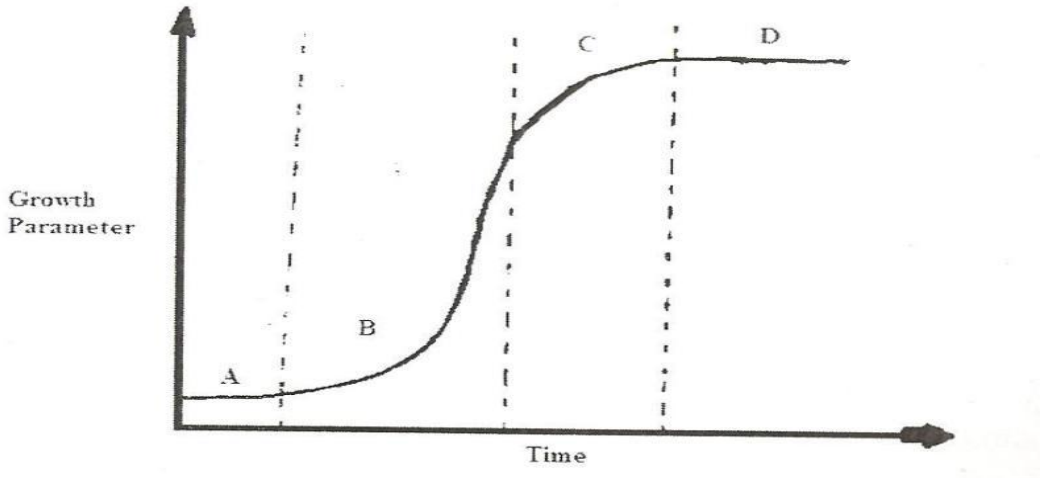
……

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b) What mechanism facilitates the movement of the ovum towards the uterus?

(1 mark)

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




a) Identify the type of growth curve shown. (1 mark)

……

……

b) State one factor that leads to phase labeled B (1 mark)

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……

……

21. Give two differences between epigeal and hypogeal germination (2 marks)

……

……

……

……

22. State the function of juvenile hormone in growth and development of insects.
(1 mark)

……

……

23. (a) What is sex linkage? (1 mark)

……

……

……

……

(b) Give two sex linked genes found on the Y chromosome. (2 marks)

……

……

……

……

24. Below is a nucleotide strand

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

a) Identify the type of nucleic acid (1 mark)

……

……

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

……

……

25. (a) What are analogous structures? (1 mark)

……

……

……

……

(b) Give one example of analogous structures. (1 mark)

……

……

(c) State comparative embryology as an evidence of organic evolution (2 marks)

……

……

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……

26. State two structural differences between apes and human beings. (2 marks)

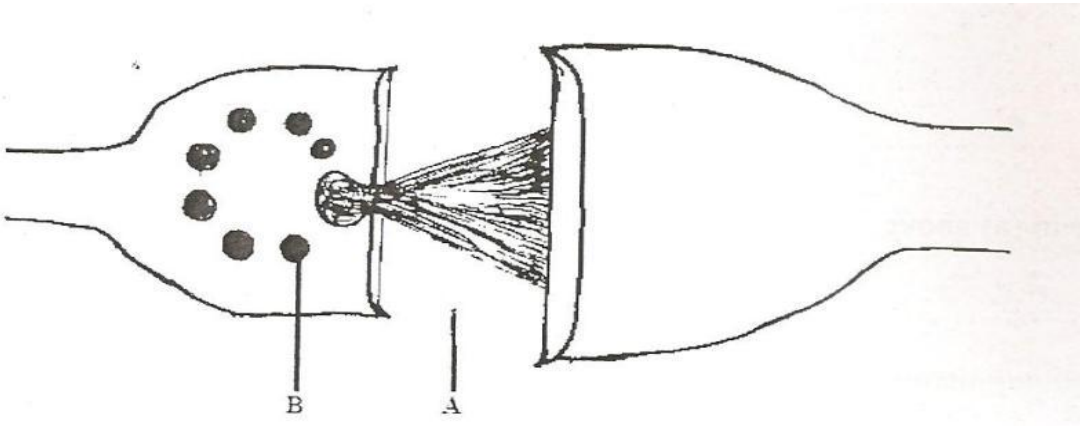
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27. The diagram below represents parts of a synapse.



a) Name part labeled A. (1 mark)

……

……

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

……

……

c) On the diagram show the direction of flow of impulse (1 mark)

……

……

28. (a) State the function of cerebrospinal fluid (1 mark)

……

……

(b) How is the choroid of the eye adapted to its function? (1 mark)

……

……

……

……

29. (a) Name a support tissue in plants that is not thickened. (1 mark)

……

……

(b) State the type of skeleton found in all vertebrates. (1 mark)

……

……

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# TRIAL 8

**NAME:……** **INDEX NO:……**

**SCHOOL:……..** **DATE:…….**

**SIGN:……..**

**231/2**
**BIOLOGY**
**PAPER 2**
**(THEORY)**
**TIME: 2 HOURS**

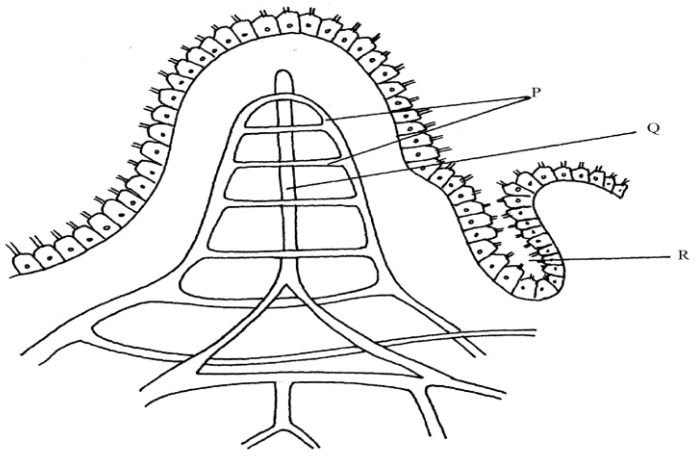
**FOR EXAMINERS USE ONLY.**

| SECTION | QUESTIONS | MAXIMUM SCORE | CANDIDATE'S SCORE |
|---|---|---|---|
| A | 1<br>2<br>3<br>4<br>5 | 8<br>8<br>8<br>8<br>8 | |
| B | 6<br>7<br>8 | 20<br>20<br>20 | |
| | **TOTAL** | **80** | |

**SECTION A (40 MARKS)**

**Answer all the questions in the spaces provided.**

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




FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

(a) Identify the structure and state its functions (2mks)

.....

.....

(b) (i) Name the parts labelled P and Q (2mks)

.....

.....

(ii) State the role of the part labelled R (1mk)

.....

.....

(c) How is the structure stated in (a) above adapted to its function (2mks)

.....

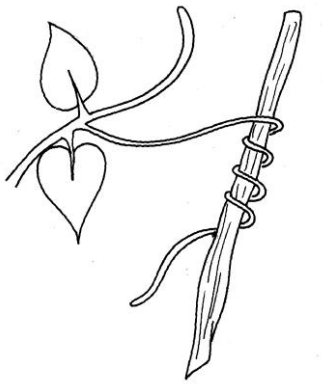
.....

(d) What is the role of enzyme enterokinase in digestion? (1mk)

.....

.....

2. (a) The diagram below illustrates a response exhibited by a certain plant tendril. Study and answer the questions that follow.



(i) Identify the type of response exhibited above. (1mk)

.....

.....

(ii) Explain how the response in (a) above occurs (3mks)

.....

.....

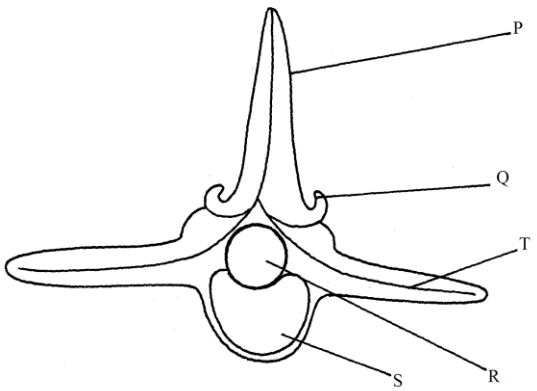
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(b) The diagram below represents the anterior view of a certain mammalian vertebra




(i) With a reason, identify the type of vertebra shown above (1mk)

.....

.....

(ii) State the role of the parts labelled

R (1mk)

.....

.....

Q (1mk)

.....

.....

3. (a) Define the following terms as applied in genetics

(i) Genetic engineering (1mk)

.....

.....

(ii) Polyploidy (1mk)

.....

.....

(b) When pure breeding red-flowered Mirabilis jalapa plant was crossed with a pure breeding white flowered plant, the resulting plants produced pink flowers only. Using letter R to represent the gene for red flowers, and W for white flowers;

(i) Work out the genotypes of the F2 generation (4mks)

(ii) State the phenotypic ration of the F2 plants (1mk)

.....

(iii) Account for the occurrence of the pink flowered plants in the F1 generation (1mk)

.....

.....

4. (a) Name the type of circulatory system found in members of the class insecta (1mk)

.....

(b) Name the blood vessels that transport blood from:

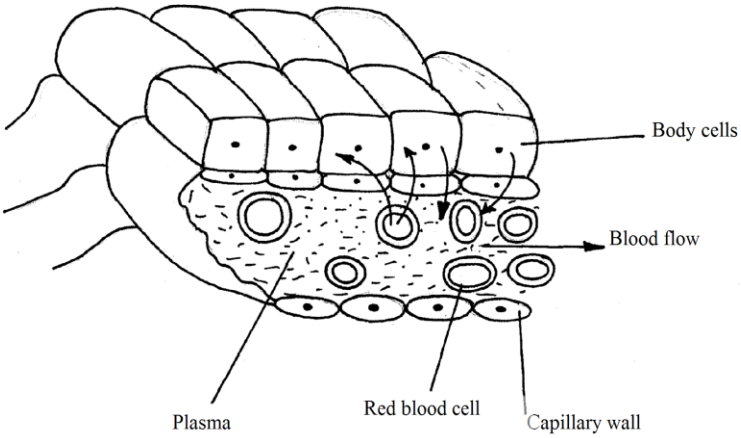
(i) Small intestines to the liver (1mk)

.....

(ii) Lungs to the heart (1mk)

.....

(c) The diagram below shows gaseous exchange in tissues




(i) Name the gas that diffuses

(I) To the body cells (1mk)

.....

(II) From the body cells (1mk)

.....

(ii) Which compound dissociates to release the gas named in (a)(i) above (1mk)

.....

(d) What is tissue fluid (2mks)

.....

.....

5. (a) Explain how the following abiotic factors affect plants

(i) Wind (2mks)

.....

.....

(ii) Humidity (2mks)

.....

.....

(b) Explain how heavy metals in industrial effluences may accumulate in the bodies of humans to toxic levels (2mks)

.....

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(c) Only a small amount of food energy in herbivores is passed onto secondary consumers. Explain (2mks)

.....

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**SECTION B (40 MARKS)**

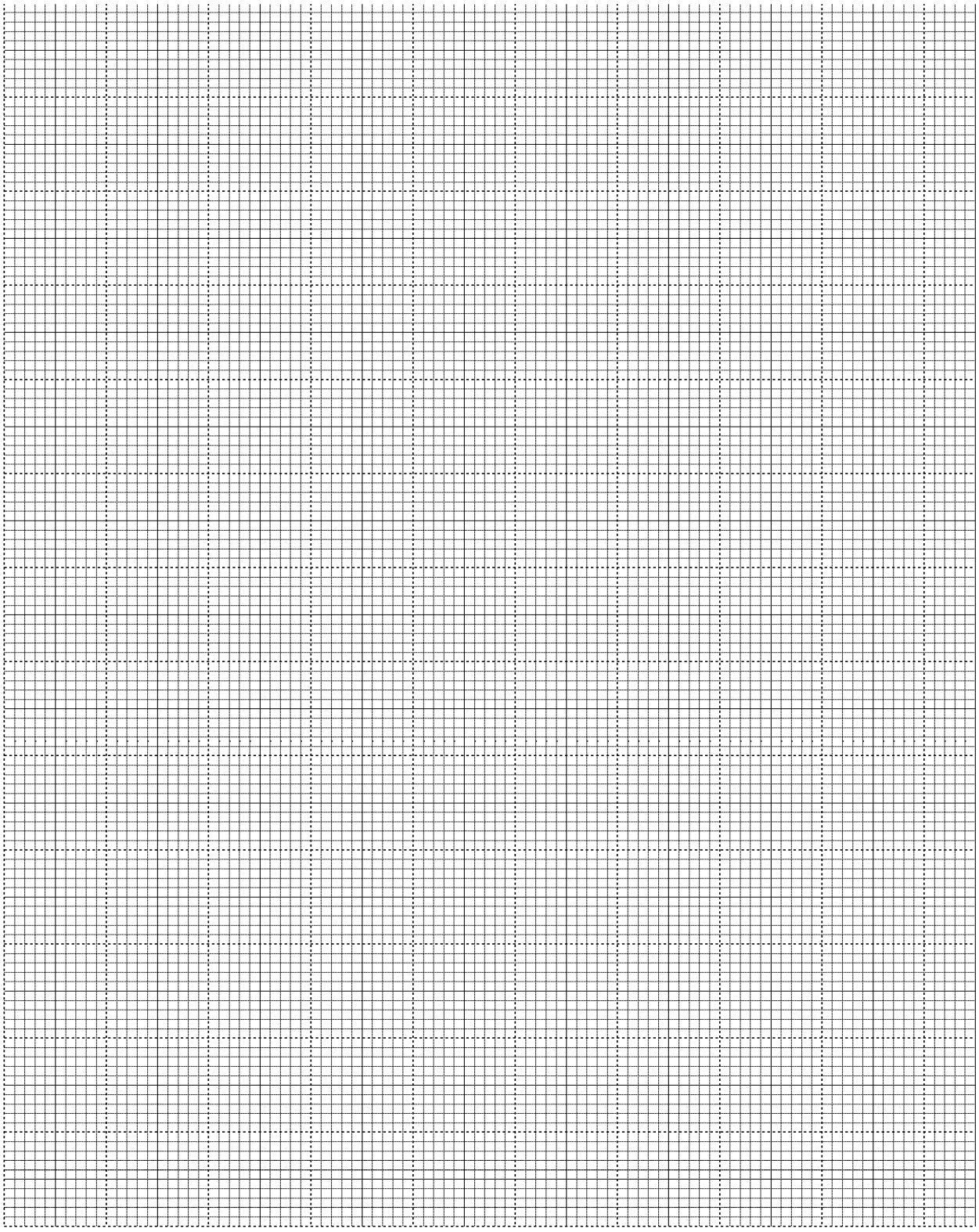
**Answer question 6(compulsory) and either question 7 or 8**

6. The mean dry weight (mg) of germinating wheat grains was worked out for a whole grain(total dry weight),endosperm and embryo.

The means were determined at two days interval for fourteen days. The results are as tabulated below.

| Time(days) | Dry weight(mg) | | |
|---|---|---|---|
| | Endosperm | Embryo | Total |
| 0 | 47 | 5 | 52 |
| 2 | 44 | 5 | 49 |
| 4 | 39 | 8 | 47 |
| 6 | 22 | 17 | 39 |
| 8 | 10 | 28 | 38 |
| 10 | 4 | 35 | 39 |
| 12 | 2 | 42 | 44 |
| 14 | 2 | 44 | 46 |

(a) Using the same axis ,draw graphs for dry weight of endosperm, embryo and total against time (8mks)



(b) What was the average dry weight of embryo on day II? (1mk)

.....

(c) Account for the shape of the curve for

(i) Embryo from day 2 to day 12 (2mks)

.....

.....

.....

.....

(ii) Total dry weight (gm) from day 0 to day 14 (2mks)

.....

.....

.....

.....

(d) After how long was the dry weight of

(i) Endosperm 30g? (1mk)

.....

(ii) Embryo 35g ? (1mk)

.....

(e) (i) Explain the role of water in seed germination (3mks)

.....

.....

.....

.....

(ii) Other than water, what two environmental factors are required for seed germination? (2mks)

.....

.....

.....

7. (a) Describe how natural selection brings about the adaptation of a species to its environment (10mks)

(b) Discuss the economic importance of bacteria (10mks)

8. (a) Describe the methods of excretion in plants (5mks)

(b) Explain the role of hormones in the human female menstrual cycle (15mks)

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# TRIAL 9

**NAME……..…… INDEX NO…….....…….**

**SCHOOL…… CANDIDATE'S SIGNATURE……**
**DATE……..…….……..**

**231/1**
**BIOLOGY**
**PAPER 1**
**(THEORY)**
**TIME: 2 HOURS**

**FOR EXAMINER'S USE ONLY:**

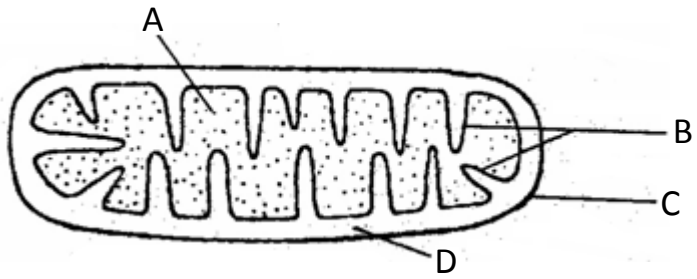
| Question | Maximum Score | Candidate's Score |
|---|---|---|
| 1 - 26 | 80 | |



1. Name the causative agent of cholera. (1 mark)

_____
_

2. The diagram **below** represents a cell organelle.




(a) Identify the organelle. (1 mark)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

_____

(b) Name the part labelled **B**. (1 mark)

_____

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

_____

_____

_____

3. State the functions of the following parts of a light microscope.
(a) Condenser. (1mark)

_____

_____

_____

(b) Diaphragm. (1 mark)

_____

_____

_____

4. (a) Explain **three** ways in which a red blood cell is adapted to its function. (3 marks)

_____

_____

_____

_____

(b) In which form is carbon (IV) oxide transported. (1 mark)

_____

_____

5. State the functions of the following organelles.

(i) Centriole. (1 mark)

_____

_____

_____

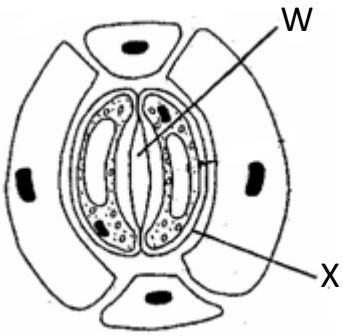
(ii) Nucleolus. (1 mark)

_____

_____

_____

6. The diagram **below** shows part of plant tissue.




(a) Name cell labelled **X** and part labelled **W**. (2 marks)

**X**

_____

**W**

_____

(b) State **two** adaptations of cell labelled **X** to its function.

_____

_____

_____

_____

7. (a) Differentiate between hypogeal germination and epigeal germination. (2 marks)

_____

_____

_____

_____

(b) State **two** causes of dormancy in seed. (2 marks)

_____

_____

_____

_____

8. (a) Define polyploidy. (1 mark)

_____

_____

_____

(b) Name **three** disorders resulting from gene mutations. (3 marks)

_____

_____

_____

9. (a) Distinguish between homologous and analogous structure. (2 marks)

_____

_____

_____

_____

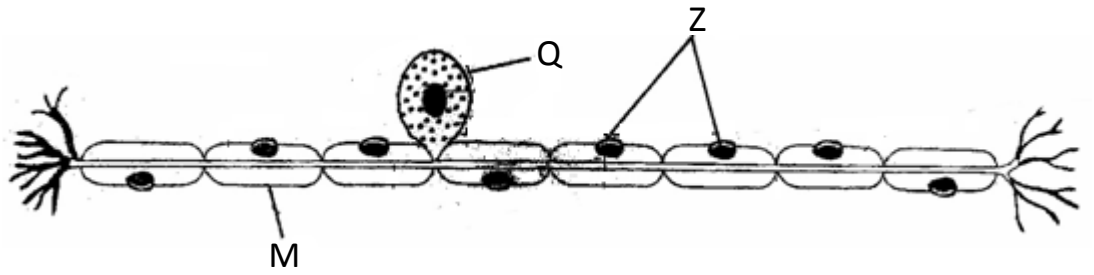
(b) Explain the term continental drift as used in evolution. (2 marks)

_____

_____

_____

10. The diagram **below** represents a sensory cell.




(a) Identify with a reason the type of neurone above. (1 mark)

_____

Reason: (1 mark)

_____

(b) Name parts labelled. (2 marks)

**Q**

_____

**Z**

_____

11. (a) Name **three** supportive tissues in plants. (3 marks)

(i) _____
_

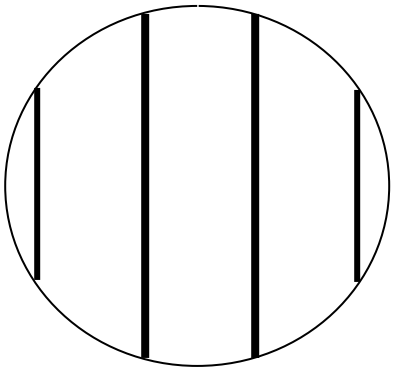
(ii) _____
_

(iii) _____
_

(b) Name the type of muscles found in the gut. (1 mark)

_____

12. A form one student trying to estimate the size of onion cells observed the following on the microscope's field of view.



(a) Define the term resolving power. (1 mark)

_____

_____

_____

(b) If the student counted 20 cells across the field of view calculate the size of one cell in micrometers. (2 marks)

_____

_____

_____

_____

13. (a) Distinguish between transpiration and guttation. (2 marks)

_____

_____

_____

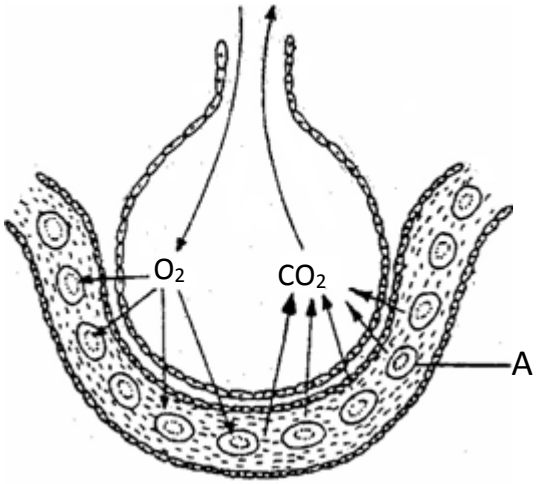
_____

(b) State **two** importance of guttation in hydrolytes. (2 marks)

_____

_____

14. The diagram **below** shows the exchange of gases in alveolus.




(a) State how the alveoli are adapted to their function. (3 marks)

(b) Name the cell labelled **A**. (1 mark)

15. (a) Distinguish between respiratory quotient and oxygen debt. (2 marks)

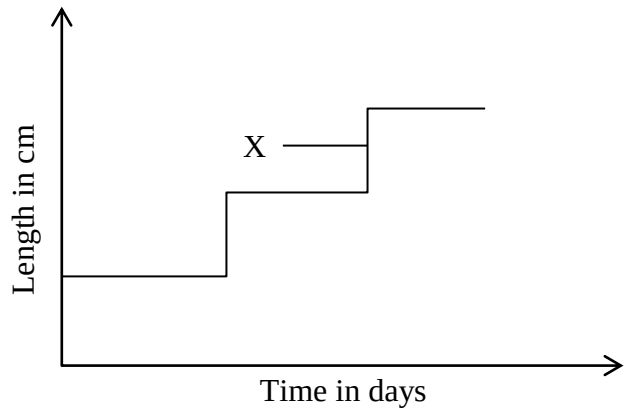
_____

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(b) Name the site where anaerobic respiration occurs in the cell. (1 mark)

_____

16. Study the graph **below** and answer the questions that follow.




(a) What is the name given to the type of graph? (1 mark)

_____

(b) What is the name used to describe point **X**. (1 mark)

_____

(c) State the importance of part **X**. (1 mark)

_____

_____

(d) Name the phylum in which the graph represented in above occurs. (1 mark)

**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

_____

17. (a) Define the term natural selection. (1 mark)

_____

_____

_____

(b) Name **three** evidence of organic evolution. (3 marks)

_____

_____

_____

*8*

18. State **one** adaptation of the following parts of mammalian eye.
(i) Fovea centralis. (1 mark)

_____

_____

_____

(ii) Sclera. (1 mark)

_____

_____

(iii) Cilliary body. (1 mark)

_____

_____

19. Name the cartilage found between vertebrae of the vertebral column. (1 mark)

_____

–

20. (a) Differentiate between gaseous exchange and ventilation. (2 marks)

_____

_____

_____

_____

(b) Name the respiratory sites of the following:

(i) Fish (1 mark)

_____

(ii) Insects (1 mark)

_____

21. (a) Name **two** cardiovascular diseases. (2 marks)

_____

_____

(b) If the nerve supply to the heart of a mammal is severed the rythymic heart contraction and relaxation will go on and heart continues to beat. Explain why. (2 marks)

_____

_____

_____

_____

22. Name **two** major branches of Biology. (2 marks)

_____

_

_____

_

23. (a) State the functions of the following apparatus.
(i) Bait trap. (1 mark)

_____

_____

_____

(ii) Pooter. (1 mark)

_____

_____

_____

24. State **two** structural adaptations of veins to their function. (2 marks)

_____

_____

_____

25. Name the process that results to formation of tissue fluid. (1 mark)

_____

26. What is serum? (1 mark)

_____

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# TRIAL 9

**NAME: …….ADM NO: ……**

**SCHOOL: …….STREAM: ……**

**INDEX NO: ……**

**231/2**
**BIOLOGY**
**Paper 2**
**2 HOURS**
**INSTRUCTION TO CANDIDATES**
Answer ALL questions in section A. In section B answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

| SECTION | QUESTION | MAX. SCORE | CANDIDATE'S SCORE |
|---|---|---|---|
| A | 1 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| | 5 | 8 | |
| B | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 20 | |
| TOTAL | | 80 | |

## SECTION A (40 Marks)

1. A climbing plant twines around the stem of a tall tree.

(a) (i) Name the type of response exhibited by the climbing stem. (1 mark)

……

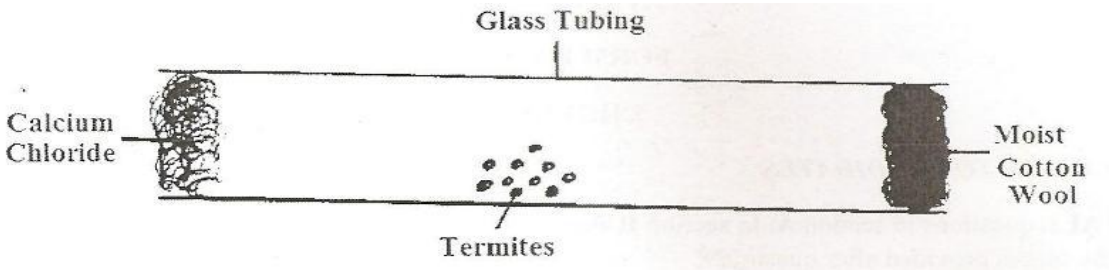
(ii) Explain how the response named in (a) (i) above takes place. (3 marks)

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(b) An experiment was carried out to investigate the response of white termites to a certain stimulus. Ten termite were placed at the centre of glass tubing. Calcium chloride was placed one end of the tubing and moist cotton wool at the other end as illustrated below.




(i) What observations are made after 20 minutes? (1 mark)

……

……

(ii) What type of response is exhibited by the termites? (1 mark)

……

……

(iii) What is the survival value of the above response? (1 mark)

……

……

(iv) What is Photonasty? (1 mark)

……

……

2. (a) What is multiple allelism? (1 mark)

……

……

(b) A pure breeding black male mouse was mated with a pure breeding brown female mouse. All the offspring had black coat colour.

(i) Explain the appearance of black coat colour in the offspring. (1 mark)

……

……

(ii) If the black parental mouse was mated with a mouse that is heterozygous for coat colour, work out the genotypic ratio of offspring. Show your working.

(4 marks)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

……

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……

……

(iii) State two disorders in human beings that are as a result of chromosomal mutation.

(2 marks)

……

……

3. (a) i) What is meant by the term biological control? (1 mark)

……

……

……

(ii) Give an example of biological (1 mark)

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(b) (i) What is eutrophication? (3 marks)

……

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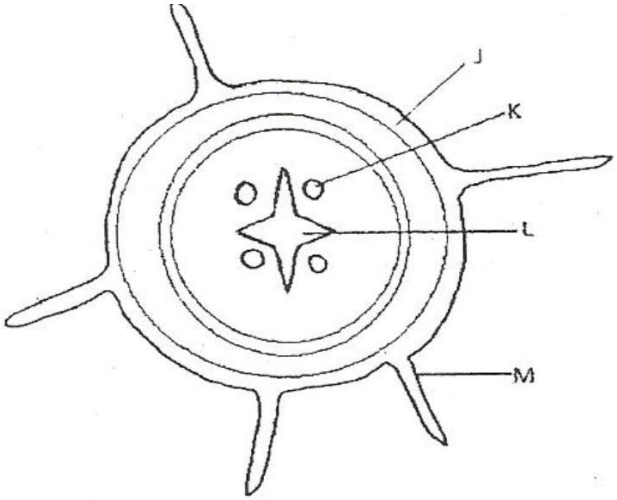
(ii) What are the effects of eutrophication? (3 marks)

……

……

……

4. The diagram below represents a transverse section of a plant organ.




**FOR MARKING : P 0705525657**

(a) From which plant organ was the section obtained. (1 mark)

……

……

(b) Give two reasons for your answer in (a) above. (2 marks)

……

……

……

……

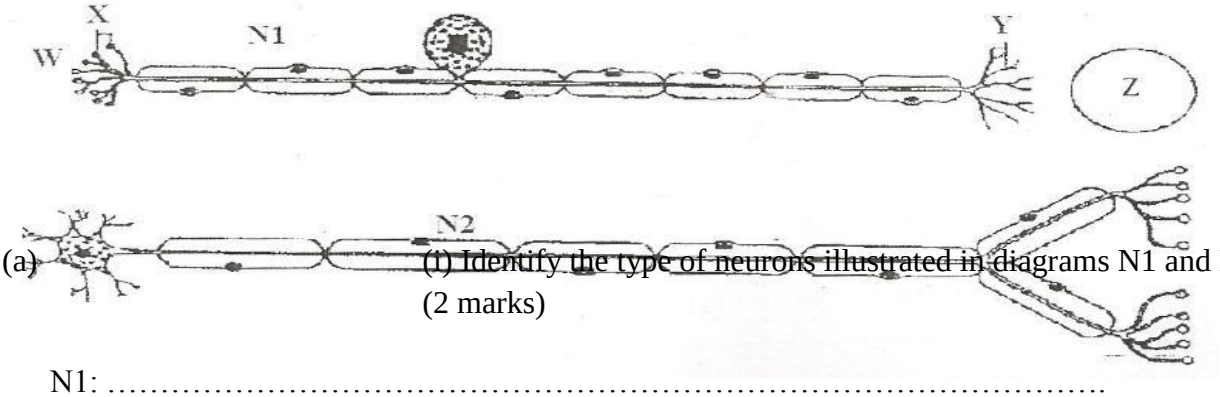
(c) Name the parts labeled J, K and L (3 marks)

J: ……

K: ……

L: ……

5. The diagrams below illustrate two types of neurons and associated structures. Study the diagrams carefully and answer the questions that follow.




(a) (i) Identify the type of neurons illustrated in diagrams N1 and N2. (2 marks)

N1: ……
N2: ……

(ii) Provide two reasons for your identity of the neuron in diagram N1. (2 marks)

……

……

……

……

(b) Name each of the structure labeled X and Y in diagram N1. (2 marks)

X: ……

Y: ……

(c) Give the general name of the type of cell at position Z in diagram N1. (1 mark)

……

……..

(d) Give the general name of the substance in position W in diagram N1 (1 mark)

……

……..

**SECTION B (40 MARKS)**

Answer question 6 (compulsory) in the spaces provided. Answer either question 7 or 8 in the spaces provided after question 8.

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

6. An investigation was conducted to compare water rate of water loss from twigs of two different species of plants Q and L. the twigs had equal leaf surfaces. The results of the investigation were recorded in the below.

| Time of the day | 6 a.m | 8 a.m | 10 a.m | 1 p.m | 12 p.m | 1 p.m | 2 p.m | 3 p.m | 6 p.m | 8 p.m | 12 a.m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water loss $gh^{-h}$ | 0 | 4 | 20 | 40 | 55 | 36 | 26 | 20 | 2 | 0 | 0 |
| Water loss $gh^{-h}$ Species L | 8 | 20 | 39 | 131 | 198 | 182 | 130 | 81 | 45 | 12 | 12 |

(a) On the graph paper provided on page 7, plot a graph of Water loss $gh^{-h}$ against time for the two plants. (7 marks)

(b) Name the apparatus which might have been used to investigate the rate of water loss. (1 mark)

……

……

(c) State two precautions that were taken in setting up the experiment. (2 marks)

……

……..

……Which of the plant species is likely to be adapted to arid conditions? Give a reason.

(2 marks)

……

……..

……Use the graph to answer the following questions:

(i) At what time of the day was $60gh^{-1}$ of water lost by plant species L?

……

……..

(ii) What was the rate of water loss from plant species Q at 11.00 am? (1 mark)

……

……..

(f) Account for the rate of water loss between 6.00 a.m. to 1.00 p.m. by plant species L.

(4 marks)

……

……..

……

……..

……

……..

(g) Suggest how the stomata of species Q are structurally adapted to water loss.

(2 marks)

……

……..

……

……..

7. Describe how the mammalian male reproductive system is adapted to perform its functions.

(20 marks)

8. Describe the structure and functions of various organelles in a mature animal cell.

(20 marks)

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# TRIAL 10

**BIOLOGY**

**PAPER I**

**TIME: 2 HOURS**

**NAME:…….ADM.NO:……..….CLASS:……..**

1. Rewrite the correct form of the scientific name for the African elephant Loxodonta Africana. (1 mark)

……

2. A potato cylinder measuring 100mm was placed in a concentrated salt solution for 30 minutes. Describe its texture and appearance after 30 minutes. (3 marks)

……
……
……
……
……

3. a) State one adaptation of palisade cell to its function (1mark)

……
……

b) State the products of photolysis (2marks)

……
……

4. a) What is the function of carnassial teeth (1mark)

……

……

……

5. The structure below is a centriole found in animal cells only. (2 marks)



Centriole

State its functions in animal cells.

i) ……

ii)……

6. a) People can die when they inhale gases from burning charcoal in poorly ventilated rooms. What compound is formed in the human body that leads to such deaths (1 mark)

……

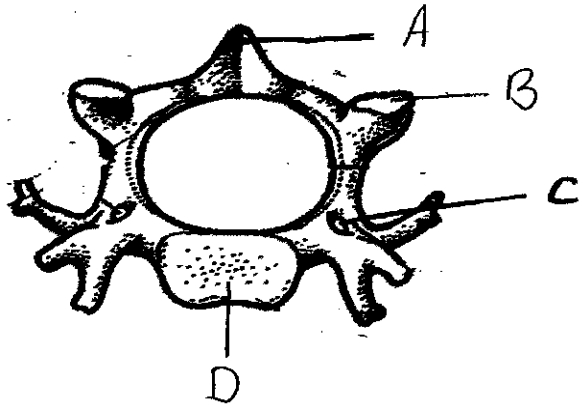
b) Most carbon (IV) oxide is transported from tissues to the lungs within the red blood cells and not in the blood plasma. Give an advantage of this mode of transport. (1 mark)

……

……

……

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



a) Identify the diagram above (1mark)

……

b) State one reason for your answer in (a) above (1mark)

……

……

c) Name the parts labeled A, B and D (3marks)

A……

B……

D……

d) State the function of the part labeled C (1mark)

……

……

8. a) State two disadvantages of fossil records as an evidence of evolution (2marks)

……

……

……

b) What is adaptive radiation (1mark)

……

……

……

9. a) Which vitamin is synthesized by bacteria in the human colon (1mark)

……

……..

b) State the function of the vitamin named in (a) above (1 mark)

……

……

……

10. Name the structure in plants involved in the following functions (3 marks)

a) Absorption of water

……
……..

b) Transport of water

……
……

c)Translocation of food

……
……..

11. Study the food chain below and answer the questions that follow

Green plants ⟶ Insects ⟶ Lizards ⟶ Eagles ⟶ Snakes

a)Name the trophic level occupied by the

- Green plants

(1mark)

……
……..

- Eagles

(1mark)

……

……..

b)Explain why energy from green plants to insects is more than that from lizards to snakes

(2marks)

……

……

……

……

……

12. a) With a reason name the structure responsible for intermittent growth in an insect

Structure

……

(1mark)

Reason

……

……..

……

……(1 mark)

b) What is the hormone responsible for growth in an insect (1mark)

……

……..

13. a) What is reversed stomatal rhythm in xerophytes (1mark)

……

……

……

b) How can this phenomenon in (a) above be a limitation to the plant in terms of gaseous exchange (1mark)

……

……

……

14. a) A dog weighing 15.2kg requires 216kJ while a mouse weighing 50g requires 2736KJ per day.

Explain

(2marks)

……

……

……

……

……

b)What is the end product of respiration in animals when there is insufficient oxygen supply

(1 mark)

……

……..

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

**----S ----- P ----- S ----- P ------ S ----- P ----- S**

**C G U C**

a) Giving a reason, name the nucleic acid to which the portion belongs (2 marks)

Name .....

Reason

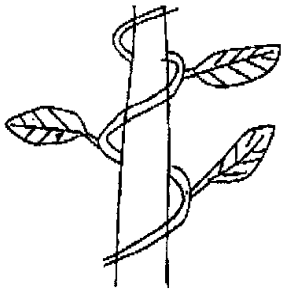
.....

b) Write down the sequence of bases of a complimentary strand to that shown above (1 mark)

.....

.....

16. The figure below shows a stem of a plant growing round a tree trunk



i) What is the name of the response which causes the twisted growth (1 mark)

.....

ii) Explain how the twisting process is accomplished (2 marks)

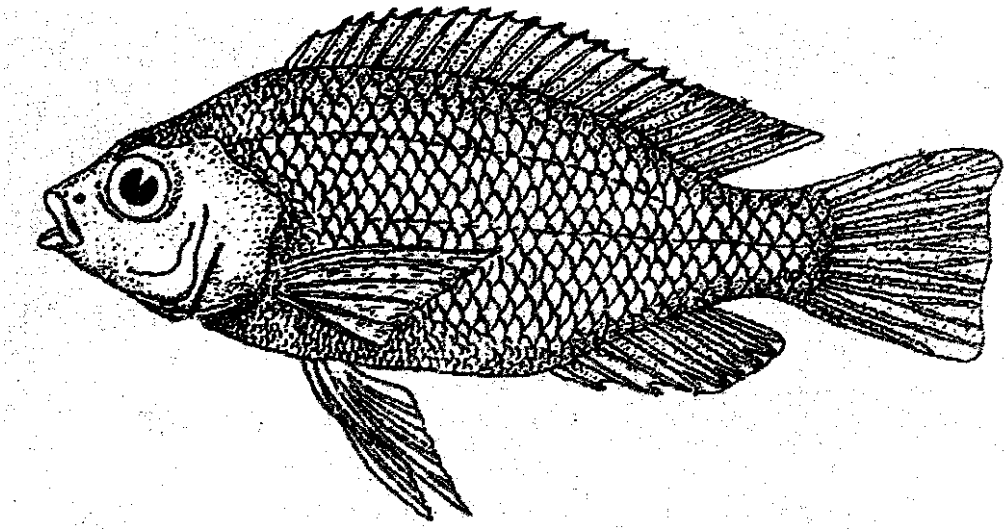
.....

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.....

17. Below is a diagram of an organism



i) State the class which the organism belongs to (1 mark)

.....

ii) State two observable characteristics used to classify the organism in the class you have mentioned in (i) above (2 marks)

.....

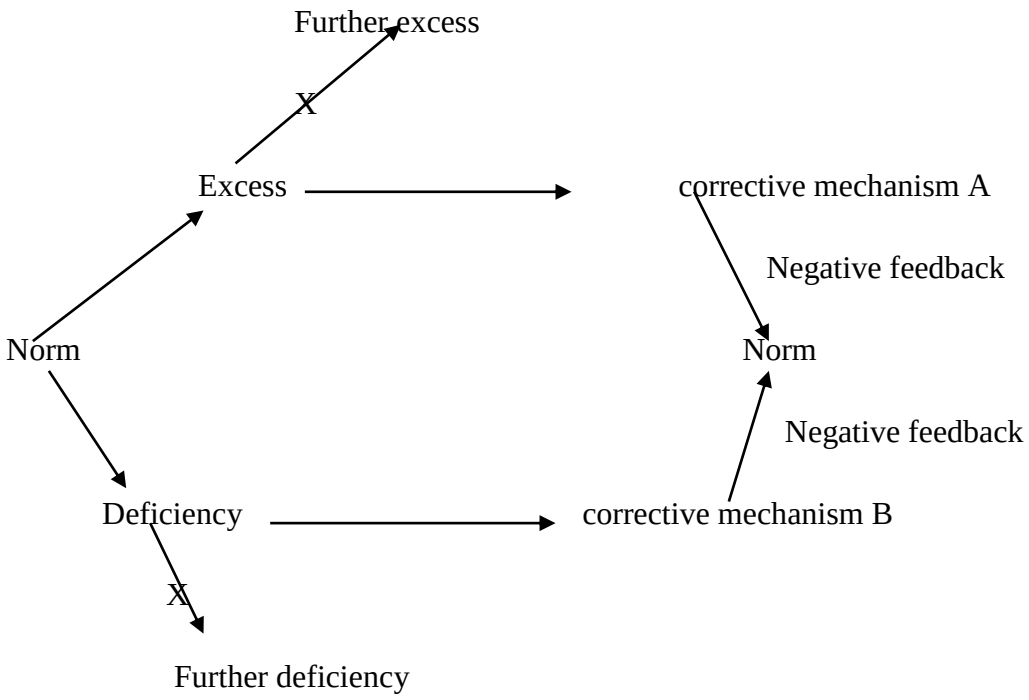
.....

18. State two examples of mutagens (2 marks)

.....

.....

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




a) Name the principle labeled X (1mark)

b) If the above diagram represented blood sugar regulation

i) State the corrective mechanisms carried out at A (2marks)

.....

ii) The condition that may result from the further excess (1mark)

.....

iii) The hormone that would be responsible for correcting the deficiency (1mark)

.....

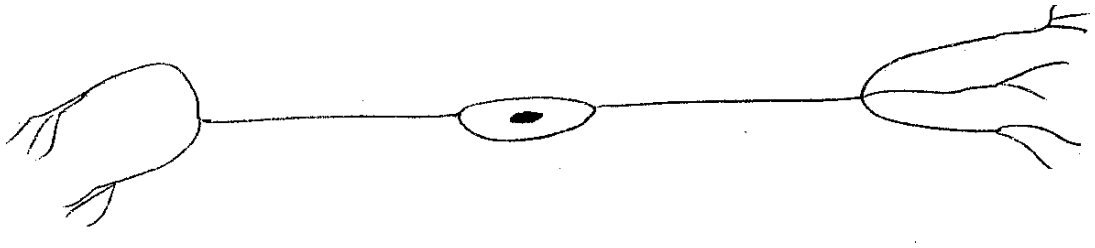
20. Name the main sites of gaseous exchange in (3 marks)

i) Mammals.....

ii) Leaves.....

iii) Amoeba.....

21. Below is a diagram illustrated for an animal tissue



a) What is the identity of the illustrated diagram (1mark)

.....

b) Where in the human body can the illustrated be found (1 mark)

.....

c) What makes it very efficient for its function of impulse transmission (1 mark)

.....

.....

22. a) Name the three strengthening tissues in plants (3 marks)

.....

.....

.....

b) State two ways in which the xylem is adapted to its function (2marks)

……

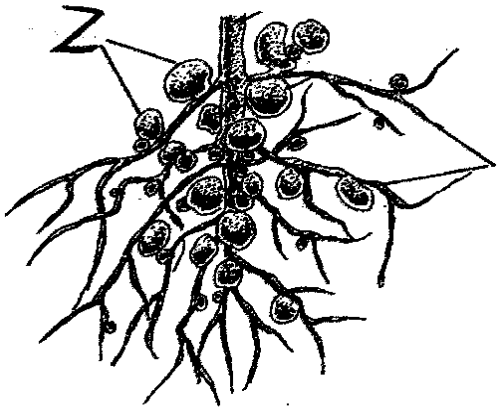
……

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…….

23. A leguminous plant uprooted showed some feature on its roots as shown below




i) State the identity of Z (1 mark)

.....

ii) Name the bacteria in Z (1 mark)

.....

iii) Name the relationship between the named bacteria and the root at Z (1 mark)

.....

iv) What mineral element is availed by the bacteria in Z to the plant (1 mark)

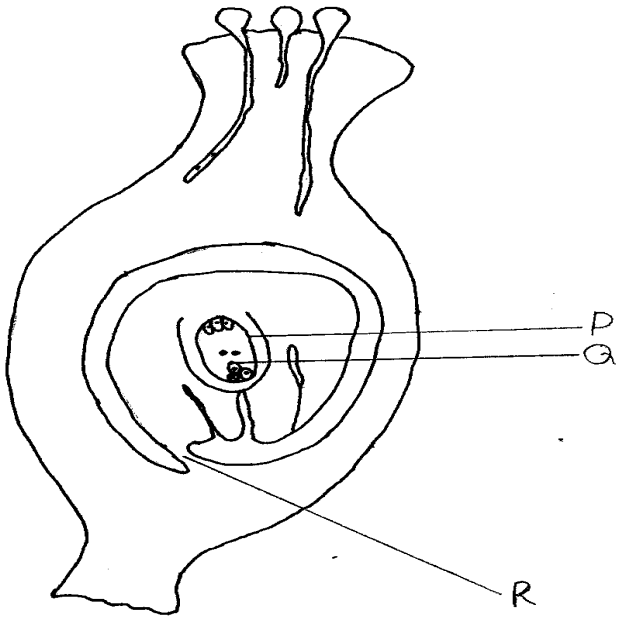
.....

v) Name one organism that reduces the element named in (iv) above reducing its availability to plants (1mark)

……

……..

24. Study the reproductive structure below




a) Name the parts labeled P and Q (2marks)

P……
……

Q……
……

b) State the function of the part labeled R (1mark)

……
……

c) How do the following factors hinder self pollination in plants

i) Protandry (1mark)

……
……
……

ii) Self sterility

(1mark)

……

……

……

25. State two functions of the enzyme thrombokinase in blood clotting process (2marks)

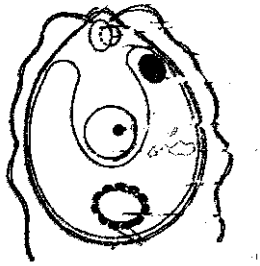
……

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26. Below is a diagram of an organism

a) What is the identity of the organism (1mark)

……

……..

b) Into which kingdom does the organism belong (1mark)

……

……..

c) Other than the locomotive structure shown by the above organism name two other locomotive structures used by other members of the above named kingdom (2marks)

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# TRIAL 10

**NAME …… INDEX NO……..……**

**SCHOOL …… CANDIDATE'S SIGNATURE……...**

**DATE……**

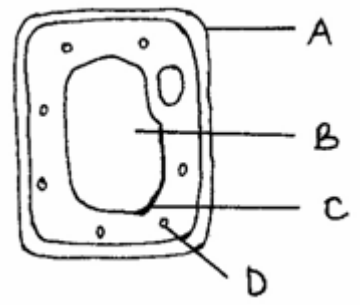
**231/2**
**BIOLOGY**
**PAPER 2**
**(THEORY)**
**TIME: 2 HOURS**

*Turnover*

**SECTION A: (40 MARKS)**

Answer **ALL** the questions in this section in the spaces provided.

1. Examine the diagram **below** and use it to answer the questions that follow.




(a) Name the parts labeled. (3mks)

**B**

_____

**C**

_____

**D**

_____

(b) What is substance which makes up part labeled **A**? (1mk)

_____

**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

(c) Name the process by which mineral salts move into structure **B**. (1mk)

_____

(d) Explain what happens when a red blood cell is put in distilled water. (3mks)

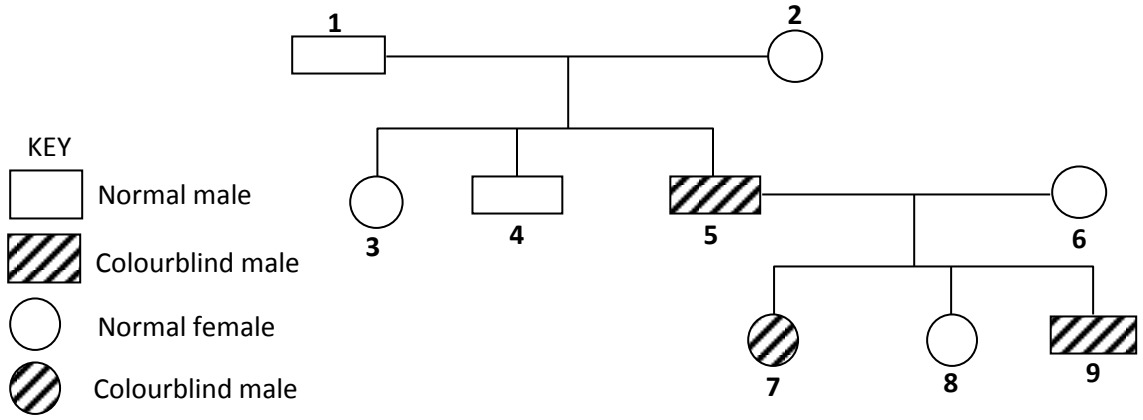
_____

_____

_____

_____

2. The figure **below** is a pedigree showing the inheritance of colourblindness, a disease transmitted through a recessive gene located on the X-chromosome.






(a) Using the symbol N for normal gene and n for colourblind gene, write down the genotypes of parents **1** and **2**. (2mks)

_____

_

_____

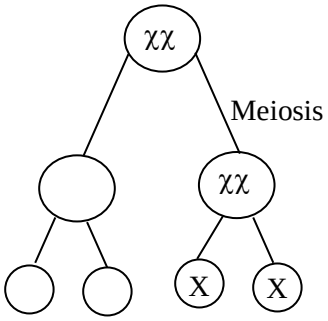
_

(b) Work out the possible genotypes of the children **3**, **4** and **5**. (4mks)

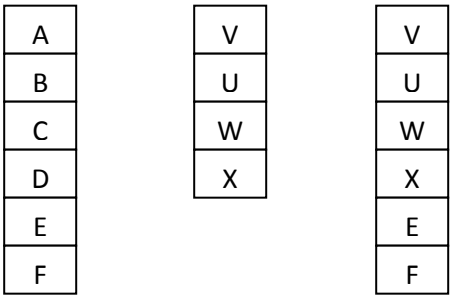
**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

(c) The diagrams **below** illustrate some chromosome mutations.

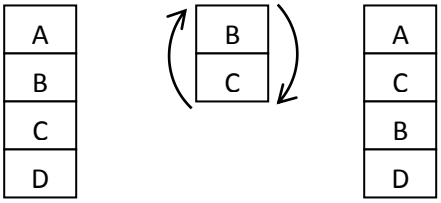
A




B




C




Identify the mutations. (3mks)

**A**

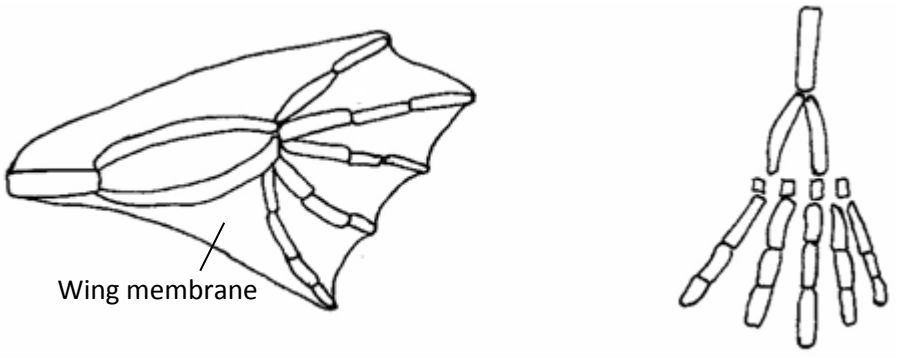
_____

**B**

_____

**C**

3. The diagram **below** shows structures of the bat wing and human arm.




(a) These structures are thought to have same ancestral origin. State **one** structural similarity and **one** adaptational difference between the two.

(i) Structural similarity. (1mk)

_____

(ii) Adaptational difference. (2mks)

_____

_____

_____

_____

(b) Give **two** other examples of structures in nature that show the type of evolution as in (a) above. (2mks)

_____

_____

(c) Distinguish between the terms 'chemical evolution' and 'organic evolution'. (2mks)

_____

_

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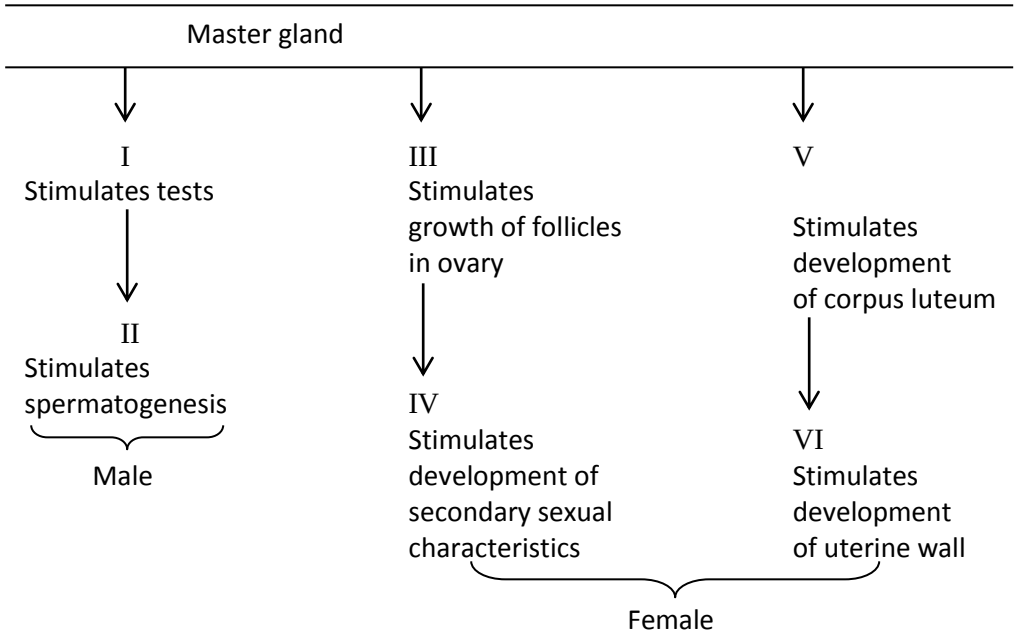
_

(d) What is the study of fossils called? (1mk)

_____

_

4. The diagram **below** represents some hormones, their sources and functions in a mammal.




(a) Identify the gland described as master gland. (1mk)

_____

(b) Name the hormones:- (4mks)

**II**

_____

**III**

_____

**V**

_____

**VI**

_____

(c) Describe the consequences of deficiency of hormone **II** in man. (2mks)

_____

_____

_____

_____

(d) Other than stimulate development of uterine wall, suggest two other functions of hormone **VI**. (2mks)

_____

_____

_____

_____

5. Ascaris lumbricoides is an endoparasite.

(a) Name the genus to which it belongs. (1mk)

_____

(b) State the habitat of the organism. (1mk)

_____

(c) State **three** ways in which the organism is adapted to living in its habitat. (3mks)

_____

_____

_____

(d) Mention **three** ways of preventing spread of the parasite. (3mks)

_____

_____

_____

**SECTION B: (40 MARKS)**

Answer question **6 (compulsory)** and EITHER question **7** or **8** in the spaces provided after question **8**.

6. The table **below** shows how the quantities of sweat and urine vary with external temperature.

| External temperature °C | Urine $cm^3/hr$ | Sweat $cm^3/hr$ |
|---|---|---|
| 0 | 100 | 5 |
| 5 | 90 | 6 |
| 10 | 80 | 10 |
| 15 | 70 | 20 |
| 20 | 60 | 30 |
| 25 | 50 | 60 |
| 30 | 40 | 120 |
| 35 | 30 | 200 |

(a) On the same graph, plot the quantities of urine and sweat produced against the external temperature. (7mk

(b) At what temperature are the amounts of sweat and urine produced equal? (1mk)

_____

_____

(c) What happens to the amount of sweat produced as the temperature rises? Explain the observation. (3mks)

(d) Explain the observation made on the amount of urine produced as the temperature increases. (3mks)

(e) How is the skin adapted for temperature regulation? (6mks)

7. Describe the structural adaptations of the mammalian heart to its function. (20mks)

8. Describe how water moves from the soil to the leaves in a tree. (20mks)

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# TRIAL 11

**NAME……INDEX NO……**

**CANDIDATES' SIGNATURE……DATE…….**

**SCHOOL…….**

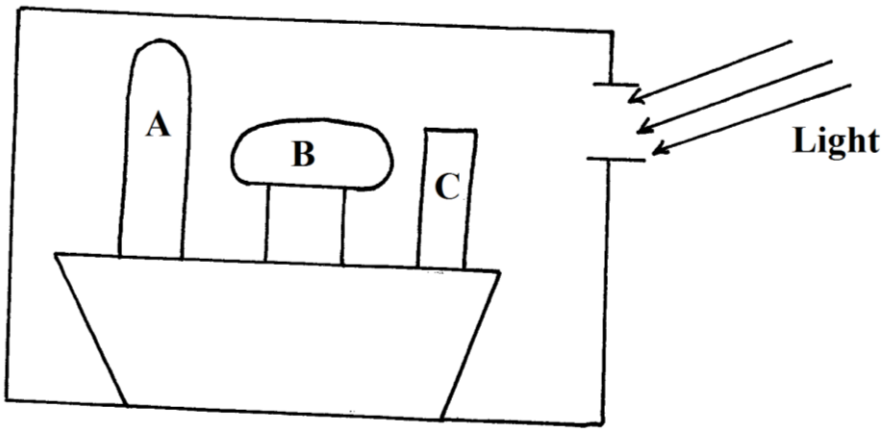
**231/1**
**BIOLOGY**
**PAPER 1**
**THEORY**
**TIME: 2 HOURS**

1 Name the element obtained from insects by insectivorous plants. (1mk)

……

……

2 An experiment was set up using seedlings as shown in the diagram below.




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

……

……..

b) Why were seedlings B and C included in the experiment? (1mk)

……

……..

3 State the importance of the following processes that take place in human nephron.

a) Ultrafiltration (1mk)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

……

……..

b) Selective reabsorption (1mk)

……

……..

4 State the functions of centrioles in a cell. (2mk)

……

……..

……

5 State **ONE** process that takes place during the light stage and ONE that takes place in the dark stage of photosynthesis. (2mks)

Light stage;

……..……

……..

Dark stage;

……..……

……..

6 Give a reason why a diet consisting of maize meal and cabbage if eaten over a long period may lead to Kwashiorkor in children. (2mks)

……..……

……..

…….

7 a) What is meant by non-disjunction? (1mk)

……

……..

b) Give **ONE** example of continuous variations in humans. (1mk)

……

……..

8 State the functions of the following parts of mammalian ear.

a) Ear Ossicles. (1mk)

……

……..

b) Semi-circular canals. (1mk)

……

……..

c) Eustachian tube. (1mk)

……

……..

9 Give a reason why primary productivity in an aquatic Ecosystem decreases with depth. (1mk)

……

……..

10 State **TWO** functions of the substance secreted by sebaceous glands. (2mks)

……..……

……..……

……..

11 a) What is homeostasis? (1mk)

……

……..

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

……

……..

……

……..

12 Name the regions in plants where the following take place. (2mks)

i) Primary growth

……

……..

ii) Secondary growth.

……..……

……..

13 State **THREE** reasons for classifying organisms. (3mks)

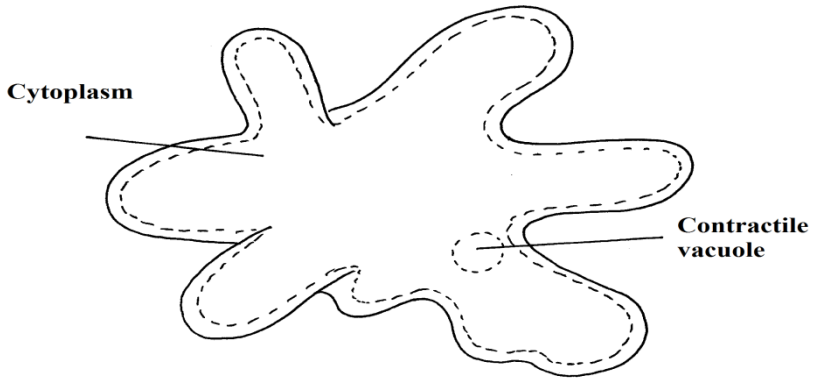
……

……..

……

……..

14 A student observing a drop of water under the high power objective lens of a microscope observed an organism and drew the following organism.




a) Suggest the kingdom to which the organism belongs. (1mk)

……..……

……..

b) Identify the organism. (1mk)

……

……..

c) Give an example of a disease caused by the organism. (1mk)

……..……

……..

15 In an experiment, the pituitary gland of a rat was removed.

a) State the effect this will have on the quantity of urine produced by the rat.

(1mk)

……..……

……..

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

……..……

……..

16 State the functions of the following parts of a light microscope. (2mks)

a) Objective lens

……..……

……..

b) Diaphragm

……..……

……..

17 State **THREE** structural differences between arteries and veins in mammals(3mks)

| **Arteries** | **Veins** |
|---|---|
| | |

18 State **TWO** ways in which plants compensate for their inability to move from one place to another. (2mks)

……..……

……..

……..……

……..

19 Distinguish between parthenogenesis and parthenocarpy. (2mks)

……..……

……..

……..……

……..

20 In view of **modern** evolution , explain why Lamarkian theory is unacceptable(2mks)

……..……

……..

……..……

……..

21 What is the functional difference between a tendon and a ligament? (1mk)

……..……

……..

22 Name **TWO** components of blood that are not present in the glumerular filtrate(2mks)

……..……

……..

……..

23 a) A person was not able to see far objects clearly but could view near objects clearly. Name the eye defect the person was suffering from. (1mk)

……..……

……..

b) How can the defect be corrected? (1mks)

……..……

……..

……..

24 a) Name **TWO** sites where gaseous exchange takes place in terrestrial plants. (2mks)

……..……

……..

……..

b) State the importance of the following features in gaseous exchange.

i) Cartilage in the trachea. (1mk)

……..……

……..

ii) Moisture on the surface of the alveoli. (1mk)

……..……

……..

25 Explain how the following adaptations minimize the rate of transpiration.

a) Sunken stomata (1mk)

……..……

……..

b) Leaf drooping (1mk)

……..……

……..

26 State the role of decomposers in an ecosystem. (1mk)

……..……

……..

27 State **THREE** advantages of asexual reproduction in organisms. (3mks)

……..……

……..

……..……

……..

28 Define the following terms as used in Ecology. (4mks)

i) Biosphere.

……..……

……..

……..

ii) Population.

……..……

……..

……..

iii) Standing crop.

……..……

……..

……..

iv) Carrying capacity.

……..……

……..

……..

29 a) Distinguish between Homologous and Analogous structures. (2mks)

……..……

……..

……..

b) Give an example in each cases the structures in (a) above. (2mks)

Homologous structure.

……..……

……..

Analogous structure.

……..……

……..

30 Explain why digestion of starch stops shortly after food enters the stomach.(1mk)

……..……

……..

31 Explain why one fails to see clearly on moving from a brightly lit room to a poorly lit room. (2mks)

……..……

……..

……..……

……..

32 What is the significance of meiosis. (2mks)

……..……

……..

……..

33 Explain how the Erythrocytes are adapted to perform their functions. (3mks)

……..……

……..

……..……

……..

34 State **ONE** function of each of the following parts of the brain. (2mks)

i) Hypothalamus.

……..……

……..

ii) Cerebrum.

……..……

……..

**END**

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# TRIAL 11

**NAME……INDEX NO……**

**CANDIDATE'S SIGN……DATE…….**

**SCHOOL…….**

**231/2**
**BIOLOGY**
**PAPER 2**
**THEORY**
**TIME: 2 HOURS**

***FOR EXAMINERS' USE ONLY.***

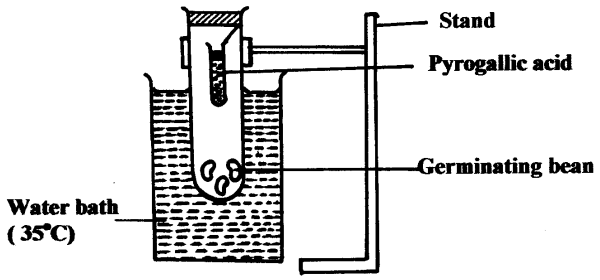
| SECTION | QUESTIONS | MAXIMUM SCORE | CANDIDATES SCORE |
|---|---|---|---|
| A | 1 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| | 5 | 8 | |
| B | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 20 | |
| | TOTAL | 80 | |

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

## SECTION A (40MARKS)

***Answer all questions in this section in the spaces provided.***

1 The diagram below shows a set up to investigate a factor necessary for germination.




FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

a) Name the factor under investigation. (1mk)

……

…….. b) State the role of pyrogallic acid in the set up. (1mk)

……..……

……..

c) Which type of respiration is taking place in the beans? (1mk)

……..……

…….

d) Write a word equation for the process named in (c) above. (1mk)

……..……

…….

e) Explain why plants can only carry out the above respiration process for a short while. (1mk)

……..……

…….

f) State other **three** factors necessary for germination. (3mks)

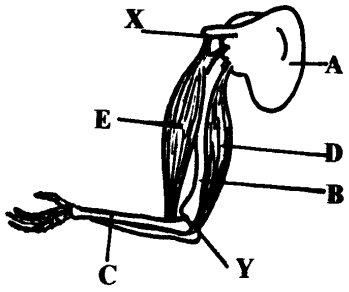
……..……

…….

……..……

…….

2 The diagram below shows the arrangement of bones and muscles in a human arm.




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

A……

B……

C……

b) Explain how parts **D** and **E** bring about flexing and extending of the arm. (2mks)

……

……

……

……

c) Name the types of joints found at points X and **Y.** (2mks)

……

……

……

……

d) Name a fluid found in all the movable joints. (1mk)

……

……

3 a) i) Name the blood vessel that connects arteries to veins. (1mk)

……

……

ii) Explain **three** ways in which the vessels named in (a) (i) above are adapted to carry their functions. (3mks)

……

……

……

……

b) Name the blood vessel with the highest concentration of:

i) Glucose (1mk)

……

……

ii) Carbon (IV) Oxide. (1mk)

……

……

c) i) Sate the function of cardiac muscles. (1mk)

……..……

……

ii) What is a single circulation? (1mk)

……..……

……

4 In a family of four children, the father had blood group A while the mother had blood group B.One of the children had blood group O.The father wanted to commit suicide accusing his wife of infidelity?

a) Was this accusation justified? (1mk)

……..……

……

b) With the use of a punnet square work out the genotype of other children.

(4mks)

c) The child of blood group O can donate blood , to all other children but can receive blood from none. Explain. (2mks)

……..……

……

……..……

……

d) One of the other children was able to receive blood from all the other children but donate to none. What was the blood group of such a child? (1mk)

……..……

……..……

……..……

……

5 a) Distinguish between Osmosis and Active transport. (2mks)

……..……

……

b) Study the figure below and answer the questions that follow.

i) Which solution has higher concentration of free water molecules. (1mk)

……..……

……

ii) Which solution is more concentrated? (1mk)

……..……

……

iii) In which direction will Osmosis take place? (1mk)

……..……

……

iv) What does semi-permeable membrane represents in an animal cell. (1mk)

……..……

……

c) Name **two** processes in living organisms that depend on Osmosis. (1mk)

……..……

……

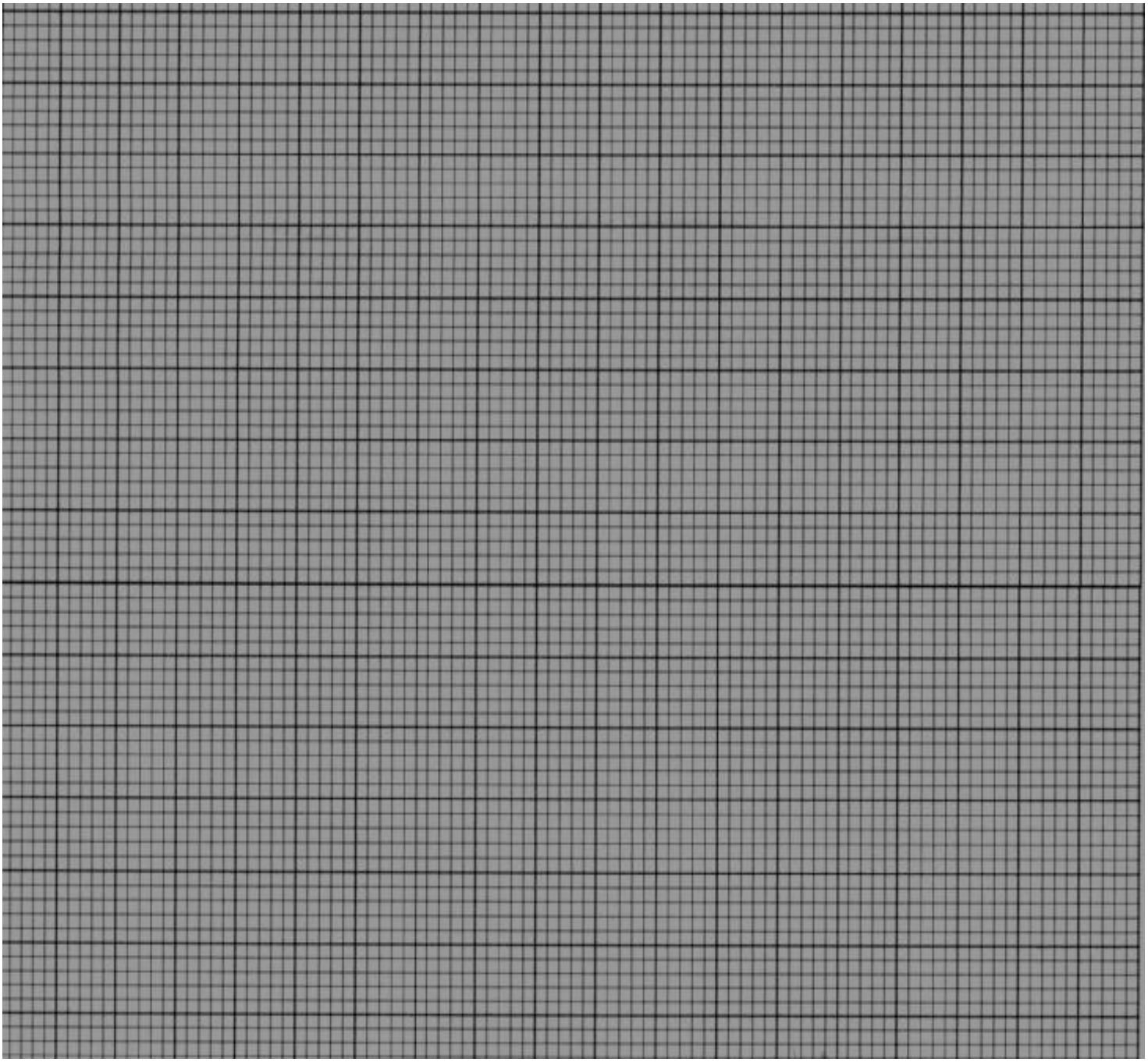
## SECTION B (40MARKS)

6 A group of students estimated the population of the grasshoppers in the school compound. The table below shows the number of grasshoppers collected from the eight sites within the compound.

| Site | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| No. of grasshoppers | 250 | 50 | 190 | 220 | 85 | 300 | 175 | 30 |

a) Draw histograms to represent the number of grasshoppers collected from each site.

(6mks)



b) The students caught 240 grasshoppers marked them and then released them. After five days they caught 160 grasshoppers and found that 40 were marked. Work out the grasshoppers population. (3mks)

c) Identify the method used in (b) above. (1mk)

……..……

……

d) Name the instrument the students used to collect and mark the grasshoppers.

(2mks)

……..……

……

e) The students encountered a number of limitations. State any three of the limitations.

(3mks)

……..……

……

……..……

……

……..……

……

f) The students observed the organisms and placed them into their correct phylum and class.

(2mks)

i) Name; Phylum……..

Class…….

ii) What features were observed for the grasshoppers to be placed in their correct;

(3mks)

Phylum…….

Class…….

7 Describe how the human skin is adapted to its function. (20mks)

8 a) State **three** aspects of light that are important in photosynthesis. (3mks)

b) Describe how the leaves of plants are adapted to carry out photosynthesis.

(17mks)

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# TRIAL 12

**Name**…… …….…… Index No:…….

**231/1**
**BIOLOGY**
**PAPER 1**
**(THEORY)**
**TIME: 2 HOURS**

Candidate's Signature ……..……
Date: ……

**For Examiners Use Only**

| Question | Maximum score | Candidate's score |
|---|---|---|
| 1- 30 | 80 | |

*This paper consists of 11printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*

1. Give **three** examples of continuous variations in human beings (3mks)

……

……

……

2. (i) Name the main product of the dark stage of photosynthesis (1mk)

……

(ii) State the importance of chlorophyll in photosynthesis (1mk)

……

……

3. (a) Define the term balanced diet (1mk)

……

……

……

(b) State the importance of roughage in a diet (1mk)

……

4. (a) How is the *fovea centralis* adapted for its function in human eye (1mk)

……

……

**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

(b) A person was not able to see far objects clearly but could view near objects clearly. Name the eye-defect the person had (1mk)

……

……

(c) How can the defect be corrected (1mk)

……

5. (a) What is fertilization ? (2mks)

……

……

(b) Explain how double fertilization takes place in plants (2mks)

……

……

6. In an experiment, the pituitary gland of a rat was removed

(a) State the effect this will have on the quantity of urine produced by the rat. (1mk)

……

……

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

……

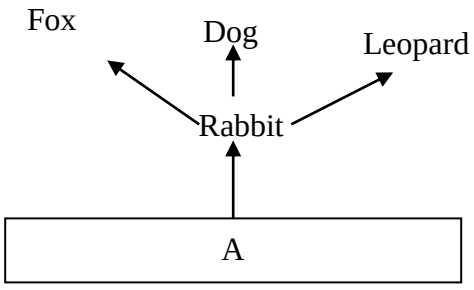
……

7. State two importance of sexual reproduction (2mks)

……

……

8. The diagram below show part of a food relationship in an ecosystem




(a) Name the food relationship shown in the diagram (1mk)

……

(b) Name the trophic level occupied by organism **A** (1mk)

……

(c) What is the main source of energy in the ecosystem shown in the diagram above? (1mk)

……

……

9. State the function of the diaghragm in the light microscope (1mk)

……

10. Explain the role of antidiuretic hormone when there is less water in the human body (3mks)

……

……

……

11. State the function of each of the following organelles

(a) Centrioles (1mk)

……

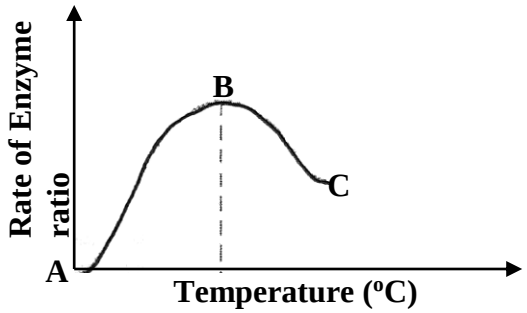
……

(b) Golgi body (1mk)

……

……

12. The graph below shows action of heat on enzyme reaction




(a) What is the effect of temperature on the rate of enzyme reaction? (2mks)

……

……

(b) State the relationship between temperature and enzyme activity (2mks)

……

……

13. Distinguish between divergent and convergent evolution (2mks)

……

……

14. State **three** distinguishing features for members of *pylum chordate* (3mks)

……

……

……

15. (a) State the reasons for the following adaptations of the xylem vessels (2mks)

(i) Narrow lumen:

……

……

(ii) Lack of cross walls

……

……

(b) State **two** distinguishing features of the phloem sieve tubes (2mks)

……

……

16. State the economic importance of the following plant excretory products

(a) Caffeine (2mks)

……

(b) Quinine (1mk)

……

17. Explain why a baby loses more heat per unit weight than an adult when exposed to the same environmental conditions (2mks)

……

……

18. During oxidation of certain food substances, the respiratory quotient was found to be 0.718

(i) Name the type of food substance being oxidized (1mk)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

……

(ii) State **two** advantages of using the food substances named (2mks)

……

……

19. The diagram below shows various types of gene mutations

Mutation 1: A B C D E F G → A B C F G

Mutation 2: A B C D E F G → A B C F G E D G

(c) Identify the type of gene mutation shown above (2mks)

Mutation 1

……

Mutation 2

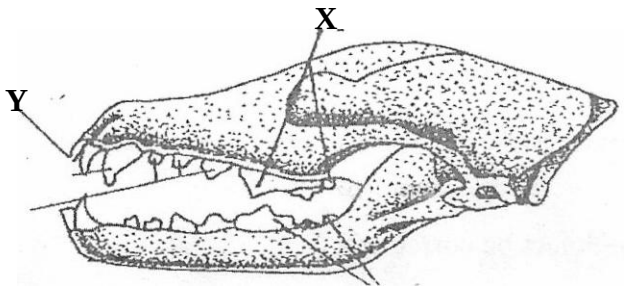
……

(d) Distinguish between gene and chromosomal mutations (2mks)

……

……

20. The diagram below shows dentition of a dog




(a) (i) Name the part labeled X (1mk)

……

(ii) Give a reason for your answer in a (i) above (1mk)

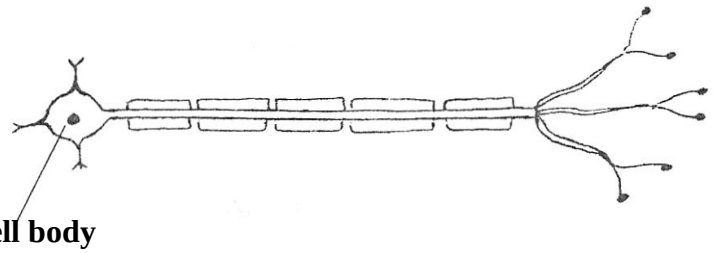
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……

(b) State how part labeled Y is adapted to its function (1mk)

……

21. The diagrams below represents a nerve cell




(a) Identify the nerve cell (1mk)

……

(b)(i) Give a reason for your answer in (a) above (1mk)

……

(iii) Show by use of an arrow the direction of flow of the nerve impulses

……

22. (a) State the importance of the following features in gaseous exchange

(i) Cartilage in the trachea (1mk)

……

……

(ii) Moisture on the surface of alveoli. (1mk)

……

……

(b) Name **two** sites where gaseous exchange takes place in terrestrial plants (2mks)

……

……

23. During germination and early growth, the dry weight of endosperm decreases while that of the embryo increases. Explain (2mks)

……

……

24. The table below shows the percentage composition of blood plasma and urine for four substances

| Component substance | Blood plasma % | Urine % |
|---|---|---|
| Urea | 0.03 | 2.0 |
| Water | 90 | 90 |
| Plasma proteins | 8.0 | 0 |

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

| | | |
|---|---|---|
| Glucose | 0.1 | 0 |

(a) Account for the absence of plasma proteins in urine (1mk)

……

……

(b) Urea concentration being greater in the urine than in the blood plasma (1mk)

……

……

25. State **three** advantages of asexual reproduction in organisms (3mks)

……

……

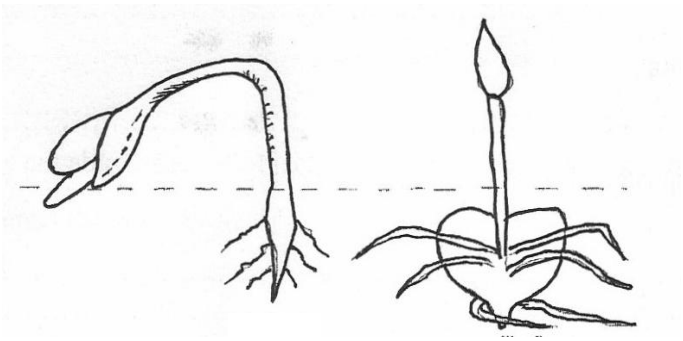
……

26. Explain how the human eye accommodates an image from a far distant object (2mks)

……

……

27. The diagram below represents a stage of growth in two different seeds



**Seedling A** **Seedling B**

(a)Identify the type of germination exhibited by seedlings A and B (2mks)

Seedling **A**

……

Seedling **B**

……

(f) State the role of oxygen in germination (1mk)

……

28. In view of modern genetics explain why Lamarckian theory is unacceptable. (2mks)

……

……

29. Define the following terms used in ecology (4mks)

(i) Biosphere

……

(ii) Population

……

(iii) Synecology

……

(iv) Carrying capacity

……

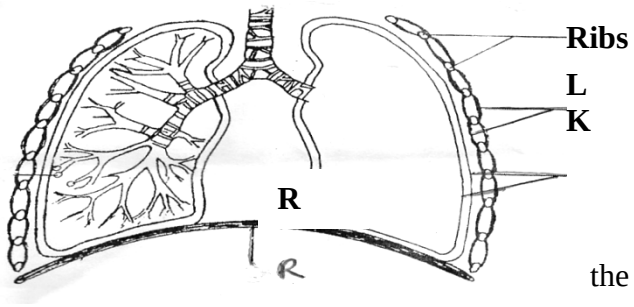
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# TRIAL 12

**Name**…… ……..… Index No:…….

**231/2** Candidate's Signature ……..……
**BIOLOGY** Date: ……
**PAPER 2(THEORY)**
**TIME: 2 HOURS**

1. The diagram below represents a part of thoracic region of a human being;




(a) Name the structures labeled **K** and **L** (2mks)

**K**……**L**…….

(b) How is structure R bring about inhalation (4mks)

……...

……...

……...

……...

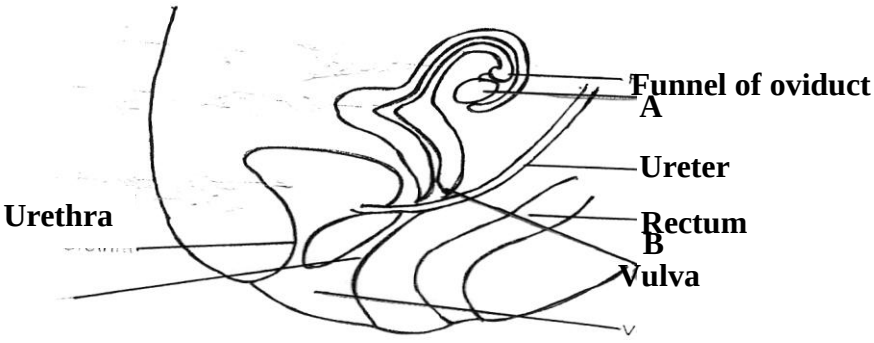
(c) Give the scientific name of the organism that causes whooping cough (1mk)

……...

(d) Name a vertebra that articulates with the ribs to the back of the chest region? (1mk)

……...

2. The diagram below shows the vertical section of a female reproductive system




**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

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

**A**……..

**B**…….

(b) Name the gonadotrophic hormone that affects the part labeled **A** (1mk)

……...

(c) (i) State a hormone(s) produced by each of the following structures in a female (2mks)

Ovary……

Placenta ……

(ii) State **one** effect of each of the above hormones on uterine wall (2mks)

……...

……...

(d)Name a sub-division in the kingdom plantae that exhibit double fertilization (1mk)

……...

3. (a) Define the following terms as used in animal nutrition

(i)Dentition (1mk)

……...

(ii) Homodont and heterodont teeth (2mks)

……...

……...

(b) State **two** functions of ileum (2mks)

……...

……...

(c) Explain the importance of the following in the process of photosynthesis; (2mks)

(i) Chlorophyll

……...

(ii) Light

……...

(d) State **one** use of Potassium in ($K^+$) ion the body (1mk)

……...

4. A man who suffers from Haemophilia which is a sex linked gene; marries a woman who is normal for the condition. However, one of their daughters Jane turns to be haemophiliac. Taking 'H' for normal trait and 'h' for haemophilia

(a) State the genotypes of the parents (2mks)

……...

**FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657**

(b) (i) Work out the genotypes of the offspring show your work (4mks)

……...

……...

……...

……...

(ii) State the genotype of Jane (1mk)

……...

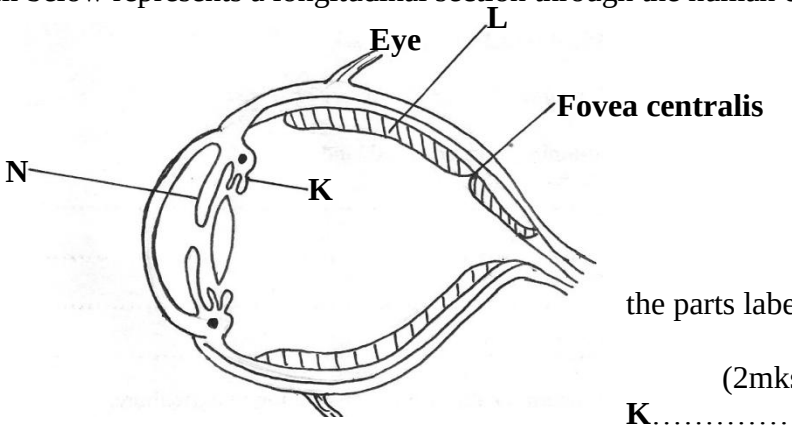
……...

(c) What is polyploidy (1mk)

……...

……...

5. The diagram below represents a longitudinal section through the human eye




(a) Name the parts labeled K and L (2mks)

**K**……

**L**……

(b) A person in totally dark room switches on light. Describe the changes that will occur to structure N (3mks)

……...

……...

……...

(c) How does the human eye obtain nutrients? (3mks)

……...

……...

……...

**SECTION B (40 MKS)**

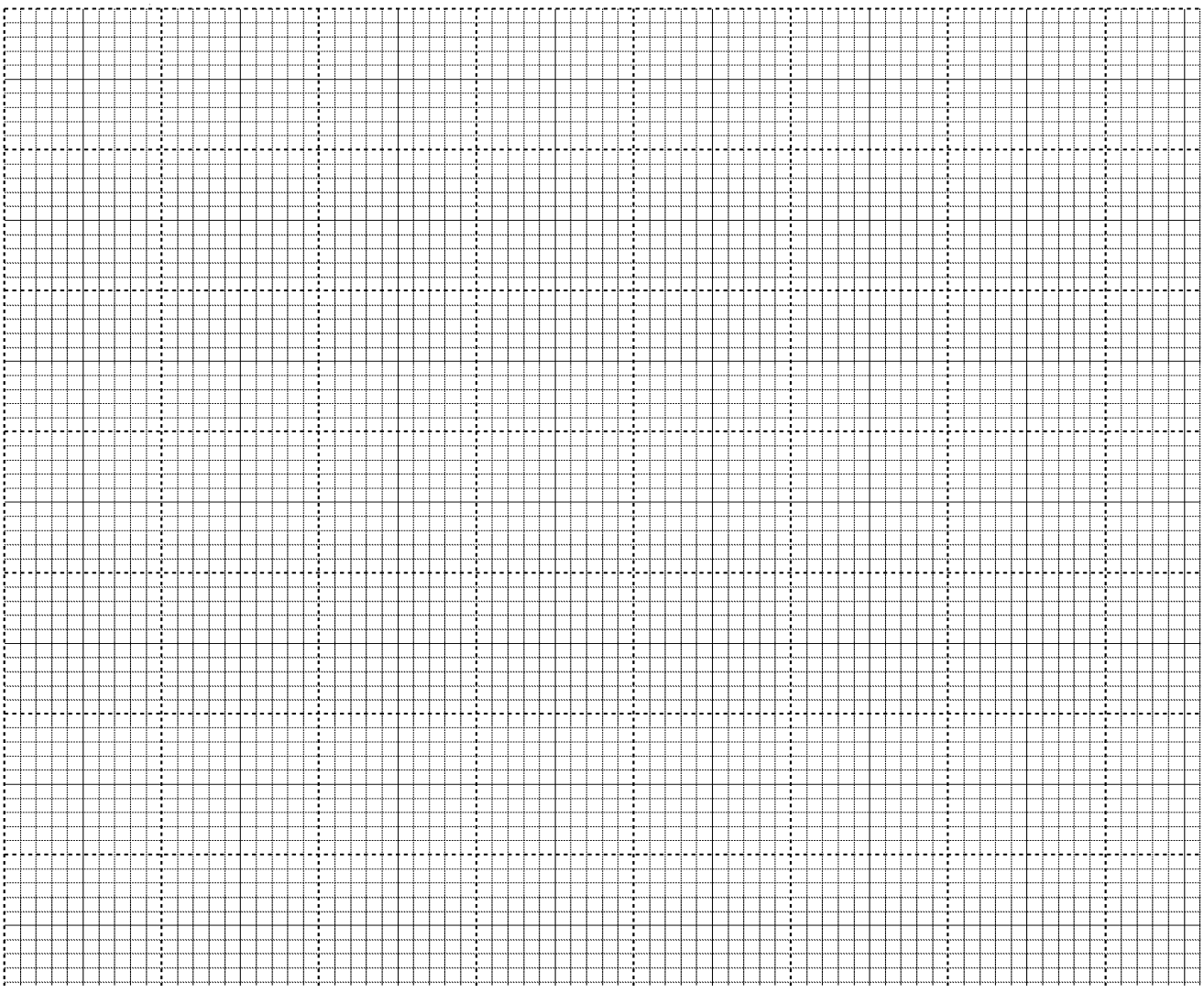
**Answer question 6 (Compulsory) and either question 7 or 8 in the spaces provide after question 8**

6. The glucose level in mg/100cm$^3$ of blood was determined in two persons Y and Z. Both had stayed for 6 hours without taking food. They were on equal amount of glucose at the start of the experiment. The amount of glucose in their blood was determined at intervals. The results are as shown in the table below:

| Time (Mins) | Glucose level in Y | Blood in mg/100cm$^3$ |
|---|---|---|
| 0 | 85 | 78 |

| | | |
|---|---|---|
| 20 | 105 | 110 |
| 30 | 116 | 130 |
| 45 | 130 | 170 |
| 60 | 100 | 195 |
| 80 | 93 | 190 |
| 100 | 90 | 140 |
| 120 | 90 | 130 |
| 140 | 88 | 120 |

(a) On the same graph and on the same axis, plot a graph of glucose level in blood against



time (7mks)

(b) What was the concentration of glucose in blood of person Y and Z at $50^{th}$ minute? (2mks)
Person **Y**
……...
Person **Z**
……...
(c) Account for the level of glucose for a person Y
(i) During the first 45 minutes (2mks)
……...
……...
(ii) After $45^{th}$ minute to the end (4mks)
……...
……...

(d) Discuss the effect of higher glucose level in blood above 90mg/100cm3 (3mks)
……...
……...

(e) State **two** advantages of homoitherms over paikilotherms (2mks)
……...
……...

7. (a) A dicotyledonous stem offer support to the plant. Give three necessities for this support(3mks)
(b) Describe the adaptation of the stem of a dicotyledonous plant to its function (17mks)

8. (a) Describe the dentition of carnivorous mammals and their adaptation to the mode of Feeding (10mks)
(b) Explain the different forms of chromosomal mutation (10mks)

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# TRIAL 13

**NAME……..…….. DATE ……**

**INDEX NO. …….…….……...…..… SIGNATURE ……..……..**
**231/1**
**BIOLOGY**
**PAPER 1**
**(THEORY)**
**TIME: 2 HOURS**

**FOR EXAMINER'S USE ONLY.**

| Questions | Maximum score | Candidate's score |
|---|---|---|
| 1 - 27 | 80 | |

1. List any three uses of energy obtained from the process of respiration. (3marks)

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2. State the functions of the following organelles (3marks)

a) lysosomes

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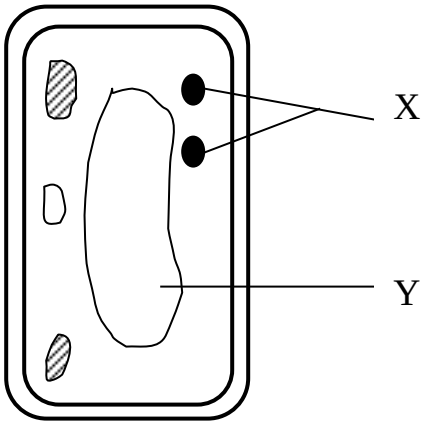
b) Golgi apparatus

.....

c) Chloroplast

.....

3. The diagram below represents a cell




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a) Name the parts labeled X and Y

X .....

Y ..... (2marks)

b) State why the structures labeled X would be more on one side than the other side. (1mark)

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4. Write the role of the following parts of microscope. (3marks)

i) Mirror

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ii) Diaphragm

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iii) Coarse adjustment knob

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5. Explain why plant cells do not burst when immersed in distilled water.

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6. An experiment was carried out to investigate the rate of reaction shown below

Sucrose ⟶ Fructose +Glucose

For the products; Fructose and Glucose to be formed, it was found that substance K was to be added and the temperature maintained at 37$^{o}$C.When another substance L was added, the reaction slowed down and eventually stopped.

(a) Suggest the identity of the substances K and L

K .....

L ..... (2marks)

(b) Explain how substance L slowed down the reaction. (1mark)

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7. (a)State the role of light in the process of photosynthesis. (2marks)

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(b) Name one product of dark reaction of in photosynthesis. (1mark)

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8. A solution of sugarcane was boiled with hydrochloric acid; sodium carbonate was added; cooled and benedict's solution was added then boiled.An orange precipitate was formed.

(a) Why was the solution boiled with hydrochrolic acid? (1mark)

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(b) Why was sodium carbonate added? (1mark)

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(c) Name the type of reaction that takes place when simple sugars combine to form complex sugar. (1mark)

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9. (a)State two functions of bile juice in the digestion of food?

(2marks)

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(b) How does substances concentration affect the rate of enzyme reaction? (1mark)

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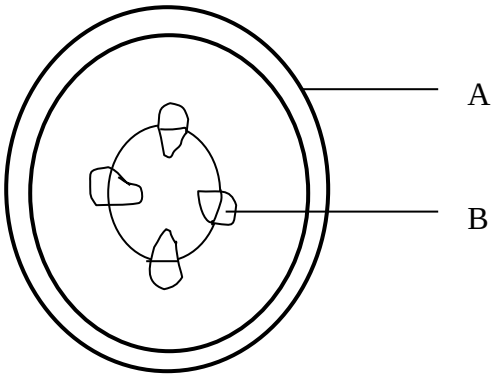
10. A certain animal has no incisors, no canines, six premolars and six molars in its upper jaw, in the lower jaw there are six incisors, two canines, six premolars and six molars. Write its dental formular?

(2marks)

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11. The diagram below represents a transverse section of a young stem.




Name parts labeled A and B

A .....

B.....

12. People can die when they inhale gases from burning charcoal in poorly ventilated rooms. What compound is formed in the human body that leads to such death? (1mark)

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13. Name two structures used for gaseous exchange in plants. (2marks)

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14. Name the physiological process by which gas exchange takes place at the respiratory surface of animal and plants. (1mark)

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15. a) Name the substance which accumulates in muscles when respiration occurs with insufficient oxygen. (1mark)

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b) In what form is energy stored in muscles? (1mark)

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16. Explain why the body temperatures of a healthy human being must rise up to $39^0$c on a humid day. (2marks)

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17. Name the part of the brain that trigger sweating (1mark)

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18. State two ways in which some fungi are beneficial to humans. (2marks)

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19. A millipede, grasshopper and crayfish all belong to Phylum Athropoda. Mention three major characteristics that they have in common. (3marks)

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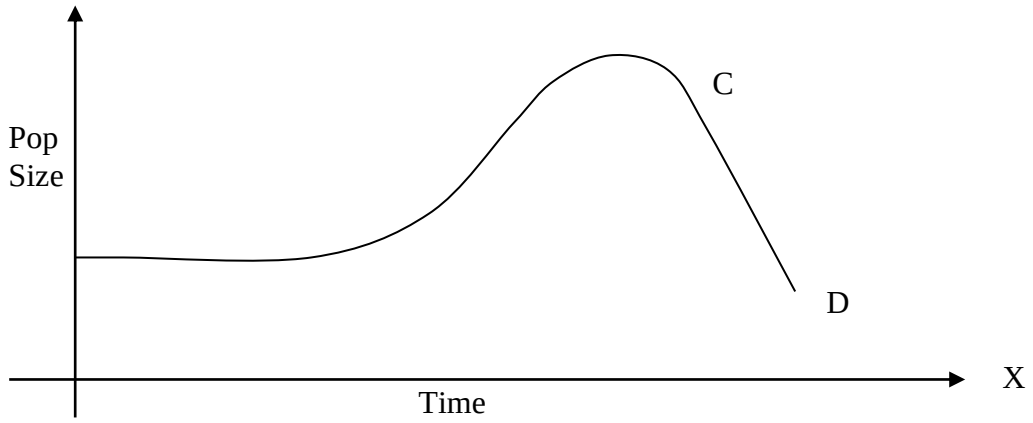
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20. The graph below represents a population growth of a certain herbivores in a grassland ecosystem over a period of time.




Suggest two factors that could have caused the population change between C and D.

(i)

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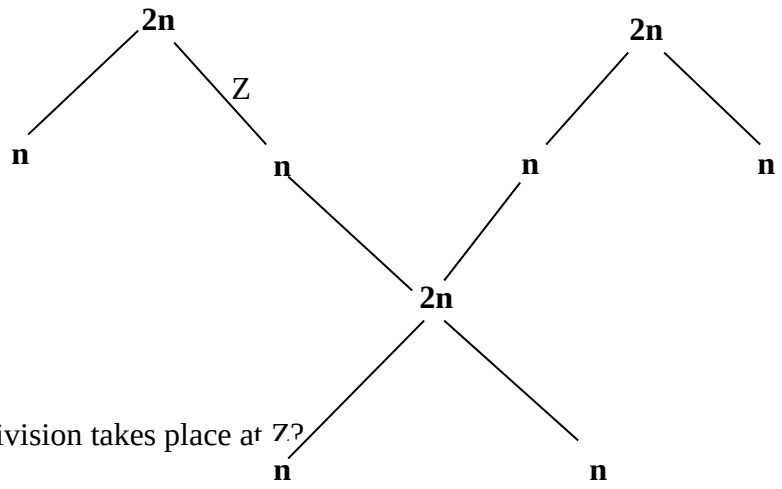
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ii)

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21. The chart below shows the number of chromosomes before and after cell division and fertilization in a mammal.




a) What type of cell division takes place at Z? (1 mark)

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b) Where in the body of a female does process Z occur? (1marks)

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22. State two physiological processes that are brought about by the application of gibberellic acid on plants. (2marks)

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23. The figure below is a structural diagram of apportion from nucleic acid strand

C ——— G ——— U ——— C

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

Name

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Reason

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b) Write down the sequence of bases of a complimentary strand to that shown above, (1mark)

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24. Explain why Lamarck's theory of evolution is not accepted by Biologists today. (2marks)

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b) Distinguish between homologous and analogous structures. (4marks)

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25. Name the hormone responsible for apical

a) Dominance (1mark)

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b) Euglena is positively phototactic, of what biological significance is this characteristic. (1mark)

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26. a) How are xylem vessels adapted for support? (1mark)

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b) Give the name of special muscles that make the heart. (1mark)

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27. State four ways in which respiratory surfaces are suited to their function. (4marks)

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28. State the role of insulin hormone in the body. (3marks)

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29. How would one find out from a sample of urine whether a person is suffering from diabetes mellitus (2marks)

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30. a) The action of ptyalin stops at the stomach. Explain (1marks)

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b) State a factor that denatures enzymes (1mark)

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c) Name the features that increase the surface area of small intestines. (2marks)

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31. a) State two characteristics that researchers select in breeding programmes. (2marks)

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b) In a maize the gene for purple colour is dominant to the gene for white colour. A pure breeding maize plant with purple grains was crossed with heterozygous plant. Using letter G to represent the gene for purple colour work out the genotypic ratio of the offspring.

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# TRIAL 13

**NAME** …… **INDEX NO** ……..……

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**DATE** ……..……..

**231/2**
**BIOLOGY**
**PAPER 2**
**(THEORY)**
**2 HOURS**

**For Examiners use only.**

| Section | Question | Maximum score | Candidates score |
|---|---|---|---|
| A | 1 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| | 5 | 8 | |
| B | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 20 | |
| | Total score | 80 | |

1. a) What is diffusion (2marks)

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b) How do the following factors affect the rate of diffusion?

i.Diffusion gradient (1mark)

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ii.Surface area volume ratio (1mark)

FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

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iii.Temperatures (1mark)

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c) Outline three roles of active transport in human body? (3marks)

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2. a) Give the differences between the following structures in wind and insect pollinated flowers? (3marks)

i. Anther

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ii. Pollen grains

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iii. Stigma

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b) What is the importance of pollination (1mark)

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c) Explain how a seed is formed after an ovule is fertilized (4marks)

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3. A cross between a red flowered plant and white flowered plant produces plants with pink flowers .Using letter R to represent the gene for red colour and W for white colour,

a) What were the parental genotypes? (1mark)

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b) Work out a cross between F1 plants. (4marks)

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c)

i. Give the phenotypic ratio of F2 plants

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ii. Genotypic ratio of F2 plants (1mark)

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FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

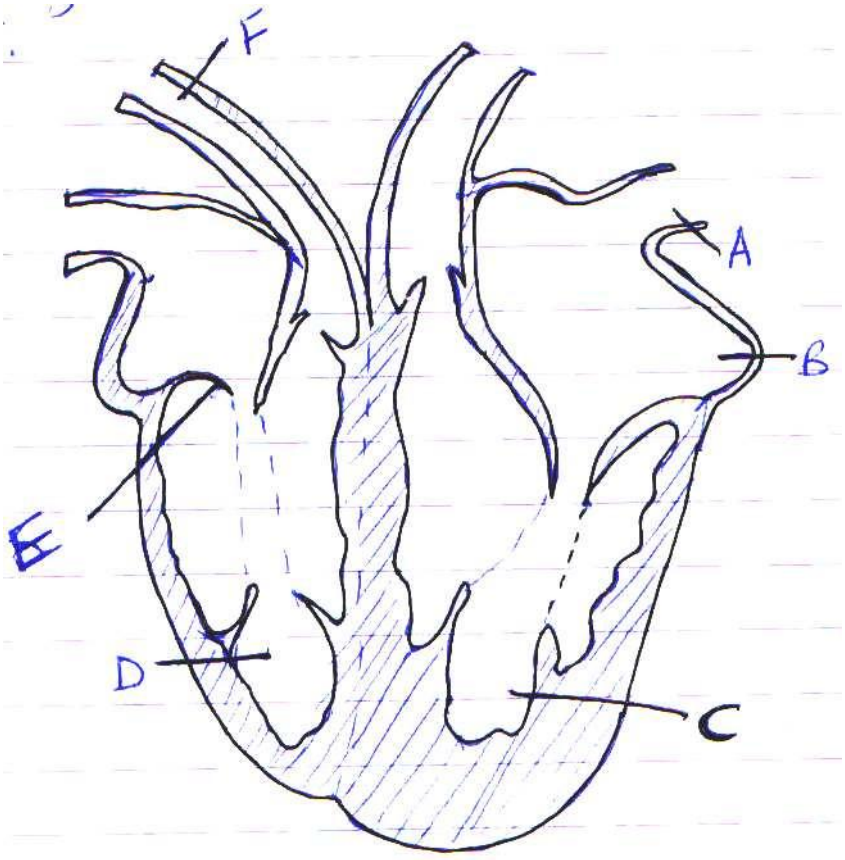
d) Name a characteristic in humans which is controlled by multiple alleles (1mark)

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




a) Name the parts labeled A, B, E, and F (4marks)

A.....

B.....

E.....

F.....

b) Use arrows to show the direction in which blood flows in the heart (2marks)

c) Give a reason why the wall of chamber C is thicker than chamber D (2marks)

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5.

a) What is the difference between Darwinian and Lamarckian theories of evolution (2marks)

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b) What is meant by the following terms. Give an example in each case.

i. Homologous structures (1mark)

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Example

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ii. Analogous structures (1mark)

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Example

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iii. Vestigial structures (1mark)

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Example

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**SECTION B**

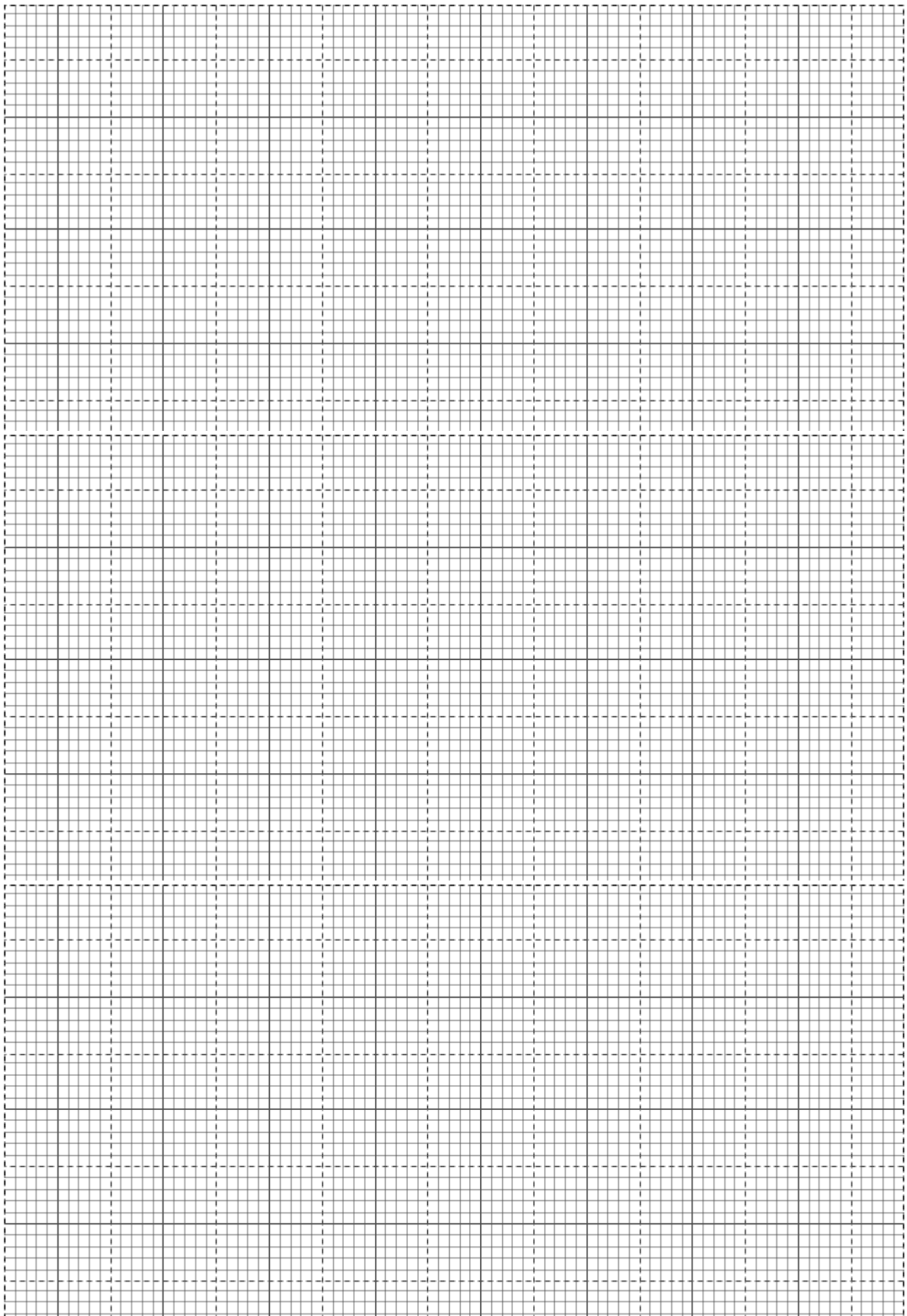
**Answer question 6(compulsory) in the spaces provided and either question 7 or 8 in the spaces provided after 8.**

6. During germination and growth of a cereal, the dry weight of endosperm, the embryo and the total dry weight were determined at two day intervals. The results are shown in the table below:

| Time after planting (days) | Dry weight of endosperm (mg) | Dry weight of embryo (mg) | Total dry weight (mg) |
|---|---|---|---|
| 0 | 43 | 2 | 45 |
| 2 | 40 | 2 | 42 |
| 4 | 33 | 7 | 40 |
| 6 | 20 | 17 | 37 |
| 8 | 10 | 25 | 35 |
| 10 | 6 | 33 | 39 |

a) Using the same axes, draw graphs of dry weight of endosperm, embryo and the total dry weight against time. (7marks)

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b) What was the total dry weight on day 5 (1mark)

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c) Account for

i. Decrease in dry weight of endosperm from 0 to 10 (2marks)

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ii. Increase in dry weight of embryo from day 0 to day 10 (2marks)

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iii. Decrease in total dry weight from day 0 to day 8 (1mark)

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iv. Increase in total dry weight after day 8 (1mark)

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d) State two factors within the seed and two outside the seed that cause dormancy

i. Within the seed. (2marks)

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ii. Outside the seed (2marks)

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e) Give two characteristics of meristematic cells (2marks)

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7. Describe how the human kidney functions (20marks)

8. Explain how abiotic factors affect plants. (20marks)

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# TRIAL 14

**NAME……..…….. DATE ……**

**INDEX NO. …….…….……...…..… SIGNATURE ……..……..**

**231/1**
**BIOLOGY**
**PAPER 1**
**(THEORY)**
**TIME: 2 HOURS**

**FOR EXAMINER'S USE ONLY.**

| Questions | Maximum score | Candidate's score |
|---|---|---|
| 1 - 27 | 80 | |

1. a) Name the organelle where Kreb's/ citric cycle take place in a cell.
(1mark)

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(b) Where are lysosomes synthesized ( 1mark)

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2. Distinguish between ecological niche and habitat.
(2mark)

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FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

3. State the importance of osmo - regulation in organisms ( 2 marks)

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4. Explain why unicellular organisms such as paramecium lack complex organs for gaseous exchange. ( 2marks)

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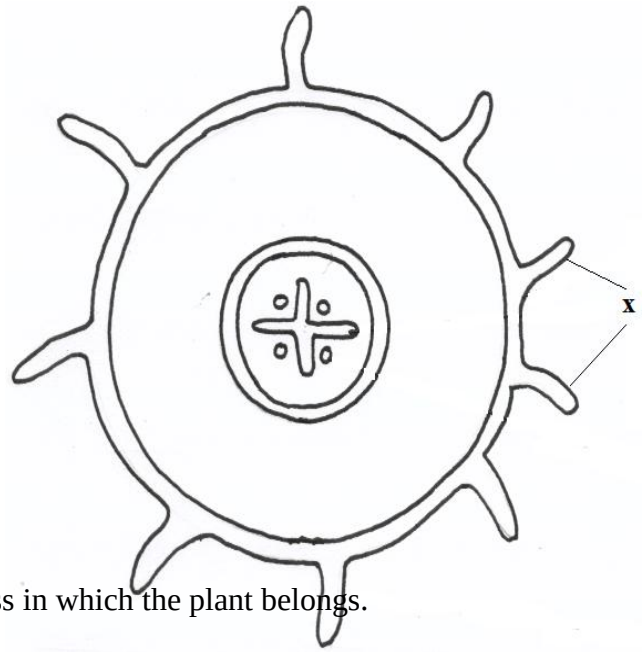
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5. The diagram below represents a transverse section of a plant part. Study it and answer the questions that follow.




a) Name the class in which the plant belongs. ( 1marks)

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b) Give a reason for answer (a) above ( 1mark)

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…….

c) State one adaptation for the structures labeled X to their functions. (1mark)

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6. State the function of the following structures in the human n ear.

(a) Semi – circular canals. ( 1mark)

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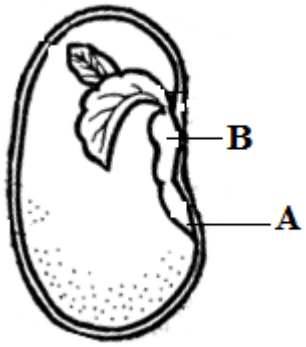
(b) Eustachian tube. ( 1mark)

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7. The diagram below shows the internal structure of a broad bean seed. Study it and answer the questions that follow.



(a) Name the part labeled B. (1 mark)

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(b) Why is it important that the part labeled A develops first during germination? ( 2 mark)

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8. Explain what causes global warming. ( 3 marks)

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9. The diagram below represents a mammalian bone.




(a) Identify the bone ( 1mark)

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(b) i) Name the bones that articulate with this bone at points K and L ( 2 marks)

K

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L

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

Amino Acids ⟶ Organic + Urea Compounds

(a) Name the process (1 mark)

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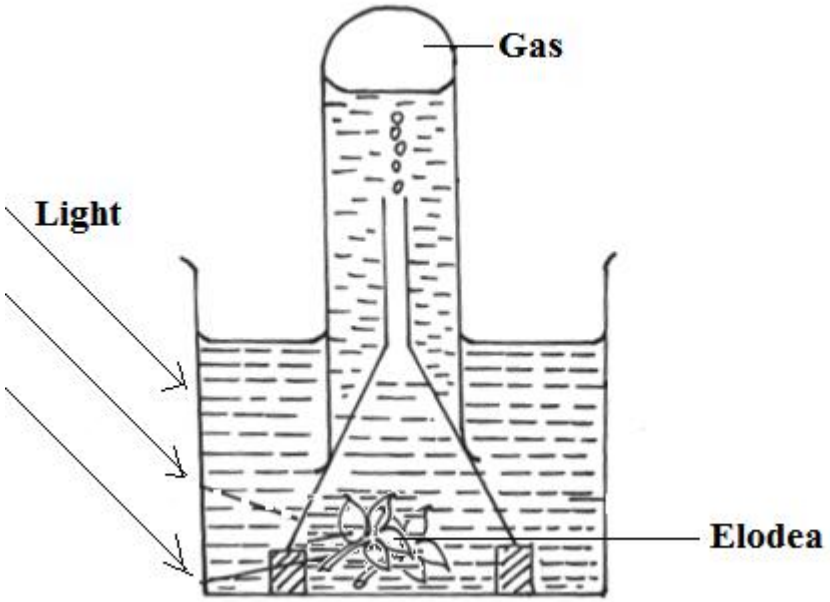
(b) What is the importance of the process to the mammal? ( 2marks)

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11. The diagram below represents a set up that was used to investigate a certain process in a plant.



(a) State the process that was being investigated. (1 mark)

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(b) Other than the factors shown, state two factors that would affect the process named in (a) above. ( 2 mark)

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12. Give an example of the sex linked trait in humans on

Y – Chromosomes

(1mark)

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X – Chromosomes (1 mark)

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13. Explain why a rat has a higher food intake compared to a lizard of the same body weight. ( 4 marks)

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14. (a) Mutua and Mwende used a light microscope to observe guard cells in a leaf surface.

They indicated a magnification of X 450 .Given that the eye piece was marked X10, work out the objective

lens magnification. (2 marks)

(b) State the function of fine adjustment knob. (1mark)

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15. State two structural differences between skeletal and smooth muscles. ( 2 marks)

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

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17. State three advantages of asexual reproduction in plants. (3 marks)

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18. a).Name the causal organism for amoebic dysentery. ( 1 mark

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b) state three preventive measures of schistosomiasis in human beings ( 3 mark)

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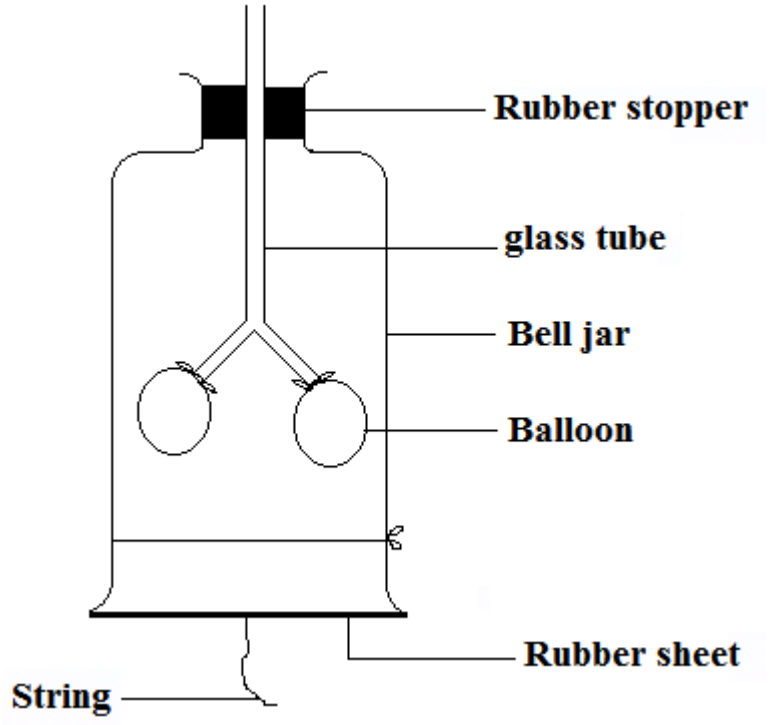
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19. Tom, a form two students set up the apparatus shown below to demonstrate the breathing mechanism in a mammal.




(a) What structure in a mammal is represented by each of the following? ( 2marks)

i) Glass tube

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ii) Rubber sheet

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(b) Explain what will happen to the balloons if the rubber is pulled down wards. ( 2 marks)

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20. a) What is adaptive radiation? ( 2marks)

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b) Explain why crossbreeding is important in animal breeding. (2 marks)

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21. a) state the most suitable biological tool for collecting the following organisms:-

i) A moth from a coffee farm. ( 1 mark)

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ii) Ants from a tree trunk. ( 1 mark)

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b) State two distinguishing characteristics of the kingdom protoctista. (2 mark)

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22. a) Name the hormone that stimulate the maturation of the graafian follicles to release a mature ovum in female

reproductive cycle. (1mark)

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b) Explain why menstruation does not take place after fertilization in human beings. (2marks)

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23. How does sunken stomata help in lowering transpiration? ( 3marks)

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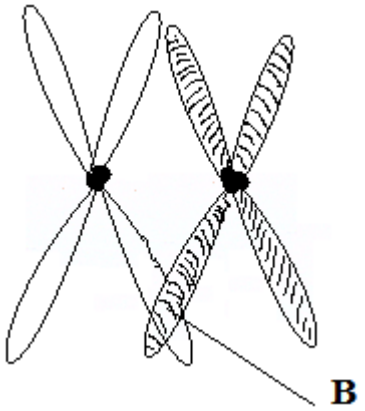
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24. The diagram below shows a phenomenon which occurs during cell division.



a) Identify the stage of cell division in which this phenomenon occurs. (1 mark)

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b) State the importance of the phenomenon taking place in the part labeled B. (2 marks)

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25. a) An organism was found to have a dental formula

$$i\ \frac{0}{3}\quad c\ \frac{0}{1}\quad pm\ \frac{3}{2}\quad m\ \frac{3}{3}$$

i) State the mode of feeding of the organism. (1mark)

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

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b) Name the vitamin which plays an important role in the formation of blood cells. (1mark)

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26. a) State **one** advantage of double circulation over single circulation. ( 1mark)

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b) State **two** adaptations of blood capillaries to their functions. (2marks)

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27. a) Name a growth hormone that has inhibitory effects in plants growth.
( 1mark)

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b) State two characteristics of a meristematic cells.
(2marks)

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28. Write down two functions of exoskeleton in the phylum Arthropoda. (2 marks)

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# TRIAL 14

**NAME** …… **INDEX NO** ……..……..

**SCHOOL** …… **SIGNATURE** ……..……...…….

**DATE** ……..……..

**231/2**
**BIOLOGY**
**PAPER 2**
**(THEORY)**
**2 HOURS**

**For Examiners use only.**

| Section | Question | Maximum score | Candidates score |
|---|---|---|---|
| A | 1 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| | 5 | 8 | |
| B | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 20 | |
| | Total score | 80 | |

**SECTION A. 40 MARKS**
**Answer all the Questions in this section.**

1. a) What is meant by the following ecological terms.

i) Population. (1mark)

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ii) Community. (1 mark)

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iii) Ecosystem (1mark)

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

i) Decomposers (1 mark)

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ii) Predation. (1mark)

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c) Give a reason why two species in an ecosystem cannot occupy the same niche.
(2marks)

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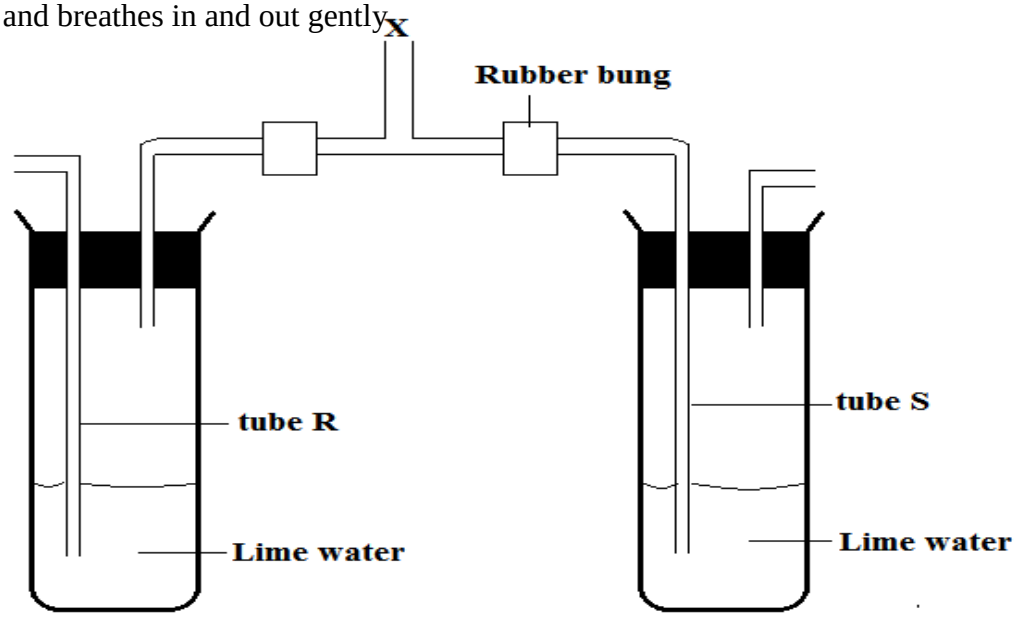
d) Name the bacteria found in the root nodules of leguminous plant.
(1mark)

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2. The apparatus whose diagram is given below can be used to demonstrate results of a physiological process that occurs in a mammal. To use the apparatus, the experimenter places his mouth at the point marked X and breathes in and out gently




FO 5657

a) State the observations in the boiling tube when the experimenter

i) Breathes in

Boiling tube A (2 marks)

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Boiling tube B (1mark)

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ii) Breathes out?

Boiling tube A (1mark)

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Boiling tube B (1 mark)

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b) What conclusion can you draw from the results of this experiment ( 2 marks)

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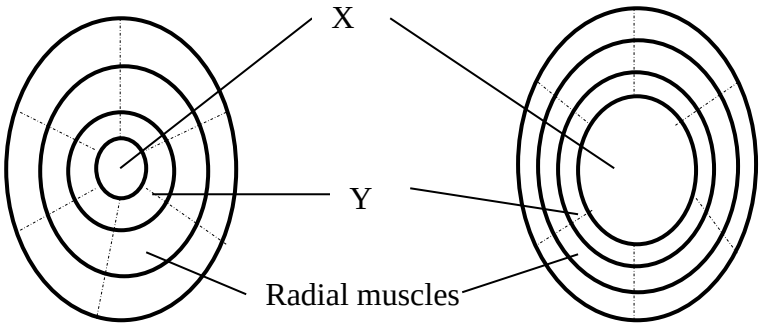
c) What is the purpose of the boiling tube A?
(1mark)

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3. The diagram below shows how the iris and pupil of human eye appear under different conditions.




a) Name the structures la A l X and Y B ( 2 marks)

X

……

Y

……

b) i) State the condition that lead to the change in appearance shown in the diagram labeled B. ( 1mark)

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ii) Describe the changes that lead to the appearance of the iris and pupil as shown in the diagram labeled B.(4 marks)

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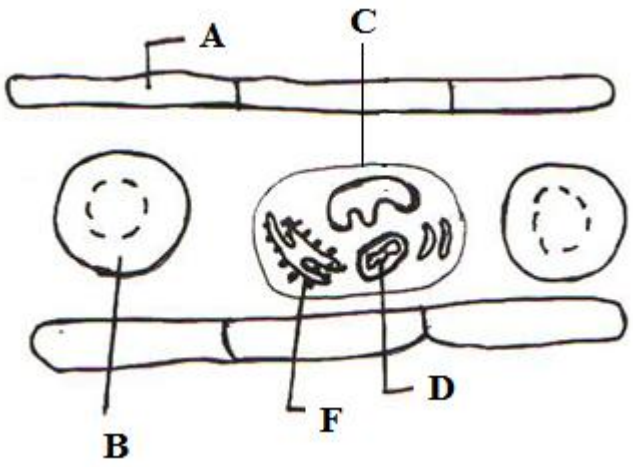
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iii) What is the significance of the changes described in (b) (ii) above. ( 1 mark)

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4.



a) Name cells A,B and C stating their functions. ( 6 marks)

| Cell | Name | Function |
|---|---|---|
| A | | |
| B | | |
| C | | |

b) Name the organelle D and F (2marks)

D

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……..……..……

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F

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5. In a plant breeding experiment, tall plants were crossed with dwarf plants. They produced 93 tall plants and 94 dwarf plants.

a) State the phenotypic ratio (1 mark)

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b) What were the genotypes of the offspring? Show your working. ( 4marks)

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c) What is a test cross? ( 1mark)

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d) What is a natural selection (2marks)

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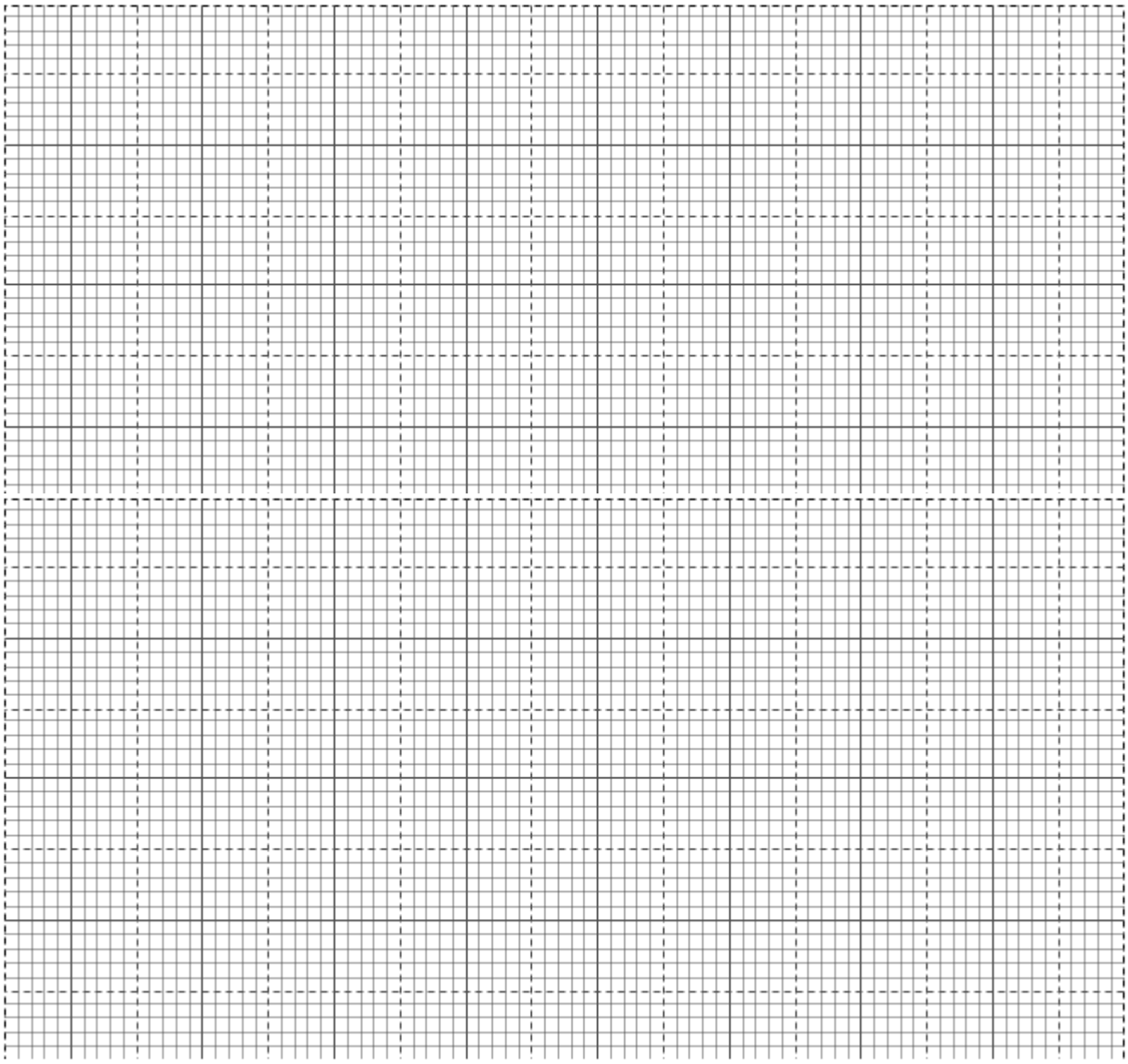
**SECTION B (40 MARKS)**

**Answer question 6 (compulsory) and either 7 or 8**

6. In an experiment to determine the effect of ringing on the concentration of sugar in the phloem, a ring of bark from the stem of a tree was cut and removed. The amount of sugar in grammes per 16cm$^3$ piece of bark above the ring was measured over a 24 – hour period. Sugar was also measured in the bark of a similar stem of tree of same species which was not ringed. The results are shown in the table below.

| Time of the day | Amount of sugar in grammes per 16 cm $^3$ piece of bark | |
|---|---|---|
| | Normal stem | Ringed stem |
| 6.45 A.M | 0.78 | 0.78 |
| 9.45 A.M | 0.80 | 0.91 |
| 12.45 P.M | 1.81 | 1.01 |
| 3.45 P.M | 1.80 | 1.04 |
| 6.45 P.M | 1.77 | 1.00 |
| 9.45 P.M | 0.73 | 0.95 |
| 12.45 A.M | 0.65 | 0.88 |

a) Using the same axis, plot graphs of the amount of sugar against time for both stems (6 marks)



b) At what time was the amount of sugar highest in the.

i) Ringed stem. (1mark)

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ii) Normal stem. (1 mark)

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c) How much sugar would be in the ringed stem if it was measured at 3: 45 am.
( 1mark)

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d) Give a reason why there was sugar in the stem of both trees at 6:45am. ( 2marks)

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e) Account for the shape of the graph for the tree with the ringed stem between:
(3 marks)

i) 6:45 and 3:45 am.

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ii) 3:45 pm and 12:45 am. (2 marks)

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f) Name the structures in the phloem that are involved in the translocation of sugars. (2 marks)

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7. (a) Explain the conditions necessary for germination in seeds. (12 marks)

(b) Describe the role of the following hormones in growth and development of plants.

i) Auxins (4 marks)

ii) Gibberellins ( 4 marks)

8. a) what is meant by the following terms

i) excretion

ii) secretion

iii) Egestion

iv) homeostasis

(b) Explain how the osmotic pressure in the human blood is maintained at normal level. (12 marks)

(c) Describe how the oxygen in the alveolus reaches the red cells. (4 marks)

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# TRIAL 15

**NAME……..…….. DATE ……**

**INDEX NO. …….…….……...…..… SIGNATURE ……..……..**

**231/1**
**BIOLOGY**
**PAPER 1**
**(THEORY)**
**TIME: 2 HOURS**

**FOR EXAMINER'S USE ONLY.**

| Questions | Maximum score | Candidate's score |
|---|---|---|
| 1 - 27 | 80 | |

1. Insects' blood is noted to lack a respiratory pigment. Explain (1 mark)

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2. State the function of the following parts of a nephron.

(i) Loop of Henle (1 mark)

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(ii) Distal convoluted tubule. (1 mark)

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3. Most terrestrial plants do not grow well in water logged soils. Give a reason for this (1mark)

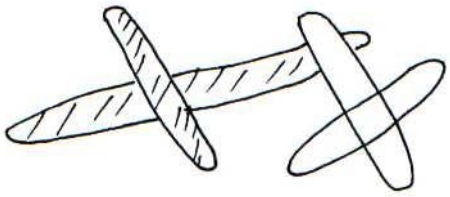
FOR MARKING SCHEMES CALL/TEXT/WHATSAPP 0705525657

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4. The diagrams below show a pair of homologous chromosomes. Study them and answer the questions that follow.



i) State the phenomenon shown above
(1mark)

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(ii) What is the genetic significance of the phenomenon above? (2 marks)

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5. Give two destinations of food translocated from the leaves of plants. (2 marks)

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6. Name the organelle that is likely to be found in abundance in:

(a) An enzyme secreting cell.

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(b) Cells producing lipid related secretions.

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(c) Areas where the cells have raptured

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7. A small boy remarked that his dog looks larger on cold days than on hot days. Give a biological explanation for this.

(2 marks)

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8. The table below shows the percentage composition of carbon (IV) oxide and oxygen in inhaled and exhaled air.

| Gases | Inhaled air | Exhaled air |
|---|---|---|
| Oxygen | 20 % | 17% |
| Carbon (IV) oxide | 0.04% | 4.0% |

Explain the differences in percentage of the two gases in inhaled and exhaled air.

(a) Oxygen (2 marks)

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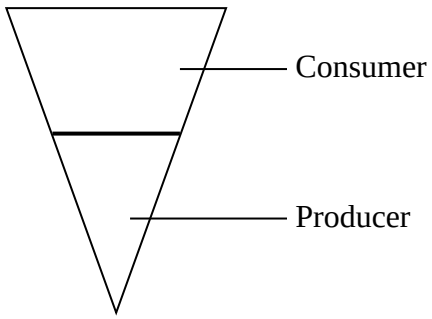
(b) Carbon (IV) oxide (2 marks)

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9. The diagram below represents a pyramid of biomass derived from a certain ecosystem.




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

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(b) State the significance of short food chains in an ecosystem. (1 mark)

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10. State two features of neurones that increase the rate of impulse transmission (2 marks)

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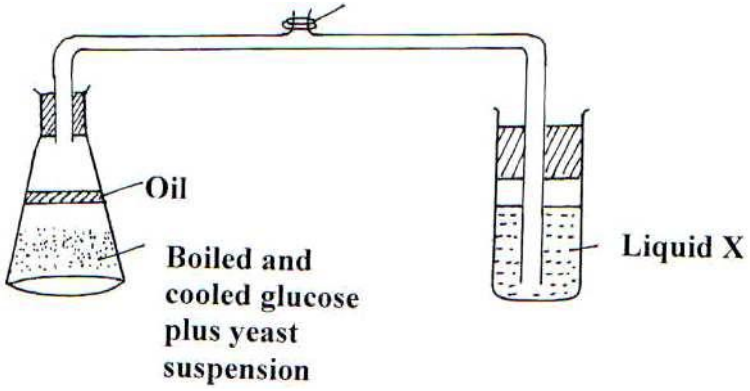
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11. Distinguish precisely between diabetes mellitus and diabetes insipidus ( 2 marks)

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12. The set up below shows apparatus to demonstrate a certain biological process




(a) What biological process was being investigated in the experiment (1 mark)

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(b) Write down a word equation that represents the reaction above. (1 mark)

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(c) In the above set up, why was it important to boil and cool glucose before adding yeast? (1 mark)

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13. Explain how the following occur during gene mutation.

i) Substitution ( 2marks)

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ii) Insertion (2marks)

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14. (a) What are meristems? ( 1mark)

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(b) (i) what is the role of cork – cambium in secondary growth?

(1mark)

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ii) Name the meristem that is responsible for increase in length of stems (1mark)

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15. State two functions of the spleen (2 marks)

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16. Name the excretory products eliminated by the following animals.

(i) Tilapia. (1 mark)

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(ii) Chicken. (1mark)

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17. State the functions of the following parts of the human ear.

(1mark)

(a) Ossicles (1mark)

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(b) Pinna (1mark)

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18. Name the causative organism of the following diseases.

(i) Malaria (1mark)

(ii) Bilharzia (1mark)

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19. Identify the part of light microscope which serve each of the functions described below

(i) Making rough focus ( 1mark)

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(ii) Reflecting light from the source (1 mark)

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20. State two characteristics of aerenchyma tissue. (2marks)

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21. What is the significance of transpiration in plants? (3marks)

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

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23. Distinguish between convergent and divergent evolution (1mark)

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24. State the characteristics that distinguish the following organisms into their respective classes (3 marks)

Millipedes,spider and tsetse fly.

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25. How do identical twins and fraternal twins arise?

(i) Identical twins (2marks)

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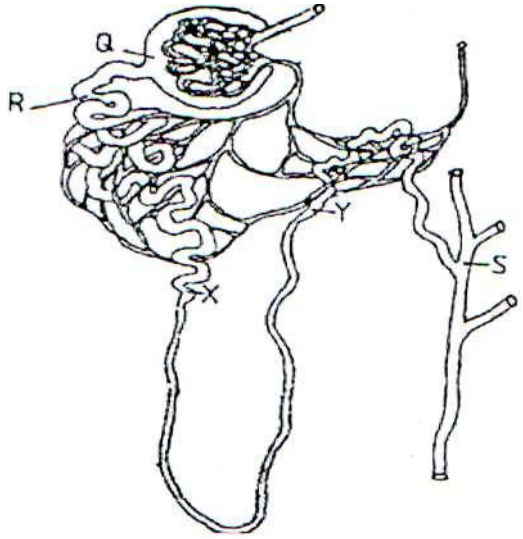
(ii) Fraternal twins. (2 marks)

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26. The diagram below illustrates part of a nephron from a mammalian kidney.




(a) Name the fluid found in the part labeled Q. (1 mark)

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(b) Identify the process responsible for the formation of the fluid named in (a) above (1mark)

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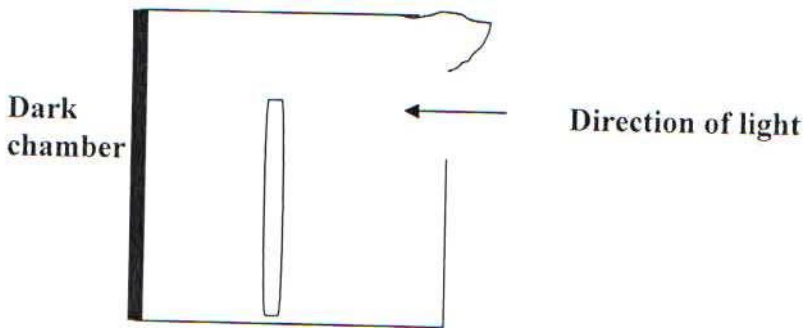
(c) Which two hormones exert their effect in the nephron? (2 marks)

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27. The diagram below shows a tip of a plant coleoptiles with light coming towards it from one side.




(a) How would the plant respond to light? (1 mark)

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(b) Give the name of such a response (1 mark)

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(c) What is the advantage of plants responding in this way?

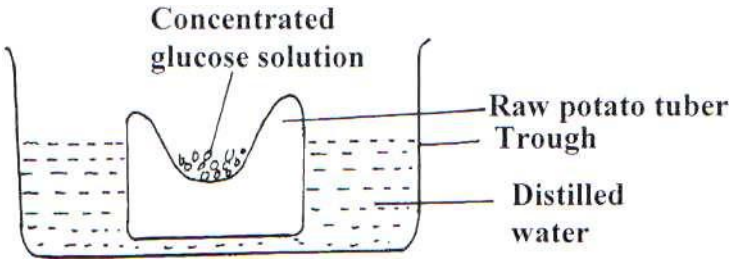
(2marks)

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28. The experiment illustrated below was set up to investigate a certain physiological process using a raw tuber.



(a) Suggest a possible physiological process that was being investigated. (1 mark)

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(b) Explain the results obtained in the above experiment after a few hours (2 marks)

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(c) State the observations that would have been made if the experiment was repeated using boiled potato.

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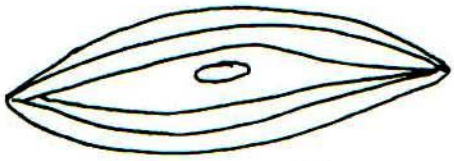
29. (a) Give two functions of blood as a tissue. (2 marks)

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(c) The figures below illustrate specialized cells in an animal body.



M



N

(i) Identify the cells M and N (2 marks)

M

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N

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(ii) State the structural differences between M and N (2marks)

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(iii)Which of the above specialized cells is found in the gut?

(1mark)

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# TRIAL 15

**NAME** …… **INDEX NO** ……..……

**SCHOOL** …… **SIGNATURE** ……...……...…….

**DATE** ……..……..

**231/2**
**BIOLOGY**
**PAPER 2**
**(THEORY)**
**2 HOURS**

**For Examiners use only.**

| Section | Question | Maximum score | Candidates score |
|---|---|---|---|
| A | 1 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| | 5 | 8 | |
| B | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 20 | |
| | Total score | 80 | |

**Section A (40 marks)**
**Answer all the questions**

9. The equation below represents a metabolic process that occurs in a certain organ in the mammalian body.

Ammonia + carbon (IV) oxide $\xrightarrow{\text{enzyme}}$ organic compound Q + water

(a) Name the process represented in the equation above. (1 mark)

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…….

(b) Name the organ in which the process occurs.

(1mark)

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……..

(c) Why is the process important to mammals

(1mark)

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…….

(d) Identify the organic compound Q. (1 mark)

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(e) Explain the source of ammonia in the organ named in (b) above. (2 marks)

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(f) What happens to organic compound Q.? (2 marks)

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10. An athlete training to take part in an international competition moved to a high altitude area where he was to train for twelve (12) days before the competition. He took his pulse rate per minute daily and tabulated them as shown below

| DAY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pulse per minute | 72 | 78 | 89 | 92 | 92 | 90 | 86 | 80 | 77 | 74 | 72 | 72 |

(a) Other than pulse rate, name one other process which was affected by change in altitude.

(1mark)

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(b) Account for the change in pulse rate from.

(i) Day 1 to day 7 (1 mark)

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(ii) Day 8 to day 12 (1 mark)

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(c) Explain the advantage this athlete has over the one who trains in a lower altitude area. (2 marks)

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(d) The equation below represents a reaction which takes place during rapid muscular movements in humans.

Glucose ⟶ lactic acid + 150kj

(i) State two effects of this reaction to an individual (2 marks)

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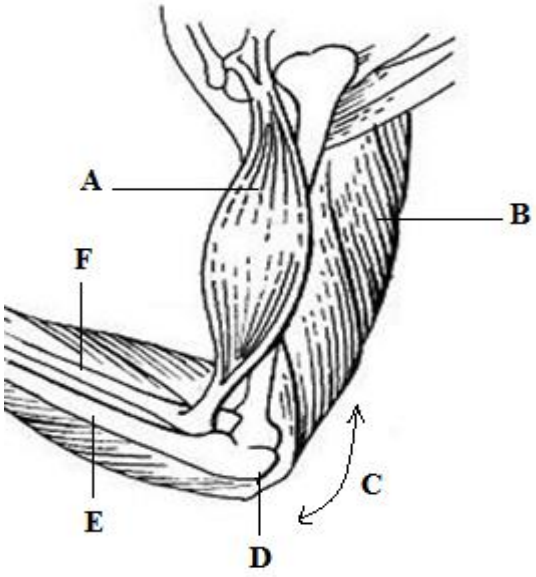
(ii) How is lactic acid finally eliminated from the muscle tissue after the muscle return to normal movement (1 mark)

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11. Study the diagram below and answer the questions which follow.



(i) Identify the muscle represented by letters A and B (2 marks)

A

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B

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…….

(ii) Describe how muscles A and B cause straightening of joint C (2 marks)

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(b) Name the joint C (1 mark)

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(c) Name parts label D, E and F (3marks)

D

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E

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F

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…….

12. In a certain bird species red flight feathers is controlled by gene R while white flight feather is controlled by gene r. The heterozygous condition Rr results into pink flight feathers.

(a) By use of a punnet or fussion lines, find the genotype of a cross between pink flight feathered bird and white flight feathered bird.

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(b) Which type of dominance is illustrated here? (1 mark)

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(c) i) Identify the nuclei acid whose base sequence is shown below. (1 mark)

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G - A - C - U - A - G - C - G - U

(ii) Give a reason for your answer in (i) above (1 mark)

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(iii)If this nucleic acid was involved in protein synthesis, how many amino acid would be present in the protein synthesized.

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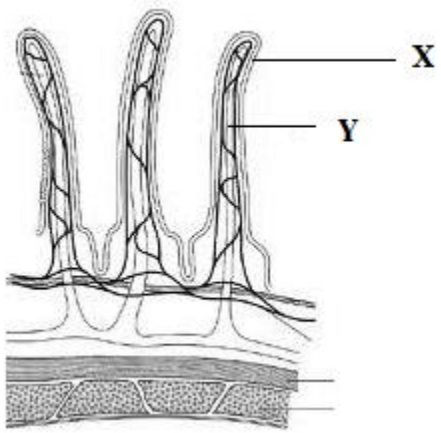
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13. The diagram below represents a longitudinal section through the ileum wall.




a) Identify the structures labeled X and Y (2 marks)

X

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Y

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b) State one function of X and Y (2 marks)

X

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…….

Y

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c) State two functions of the ileum (2 marks)

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d) Explain the role of the liver in digestion (1mark)

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e) State the endocrine (hormonal) role of pancreas in a mammal (1mark)

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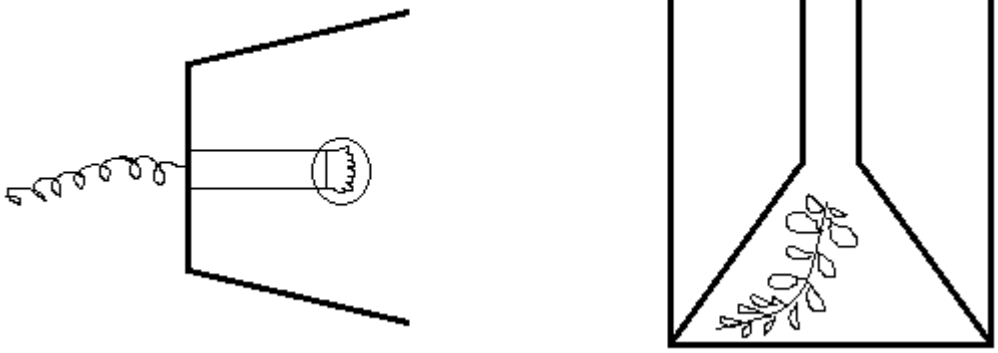
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**SECTION B**

***Answer question 6 compulsory and either question 7 or 8 in the space provided***

14. The diagram below shows an experiment that was carried out to measure rate of photosynthesis in a water plant when exposed to different light intensities.



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The shoot was exposed to different light intensities and the rate of photosynthesis estimated by counting the
number of bubbles of the gas leaving the shoot per minute. The results are tabulated below.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Number of bubble per minute | 7 | 14 | 20 | 24 | 26 | 27 | 27 | 27 |
| Light intensity (arbitrary units) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

a) Draw the graph of the number of bubbles produced per minute against light intensity. (6 marks)

b) At what light intensity did the shoot produce

i) 18 bubbles per minute

(1mark)

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ii) 25 bubbles per minute

(1mark)

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c) Give two better ways of measuring the rate of photosynthesis other than counting bubbles produced per minute.

(2 marks)

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d) What is role of light intensity in photosynthesis

(2marks)

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e) Account for the expected results if the experiment was done at the following temperatures.

(i) $4^0$c (2 marks)

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(ii) $34^0$ ( 2marks)

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(iii) $60^0$ ( 2marks)

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f) Apart from light intensity and temperature, name other <u>two</u> factors that affect the rate of photosynthesis. (2marks)

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15. (a) How are lungs adapted to their function?

(b) Describe the mechanism of opening and closing of the stomata using the photosynthesis theory.

8. (a) Describe the various mechanism of fruit and seed dispersal.

(b) Describe the various events that occur in a flower after fertilization.

END

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