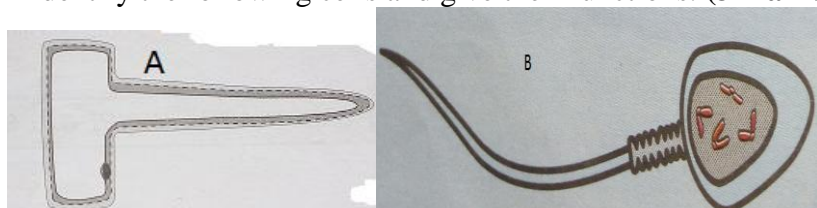


ES KANOMBE /EFOTEC
TERM II HOLIDAYS BIOLOGY PACKAGE FOR S3.

1. Identify the following cells and give their functions. (3 marks)

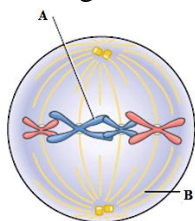


2. a) Why would you expect to find abundant rough endoplasmic reticulum in the pancreas? /2marks
 b) Why do we stain biological sections when observing under a microscope? /2marks
3. These sentences are about the function of parts of the blood. Match words from the list with each of the spaces 1-4 in the sentences. 4marks

A) Platelets B) White cells C) Red cells D) Plasma

The watery substance which contains the other blood components is called the1...The component which forms part of the body's defense mechanism are the ...2...whereas the ...3.....transport oxygen from the lungs to the rest of the body. The....4.....form part of the clotting mechanism of the blood.

4. The figure below shows one of the stages of mitosis of a cell division.



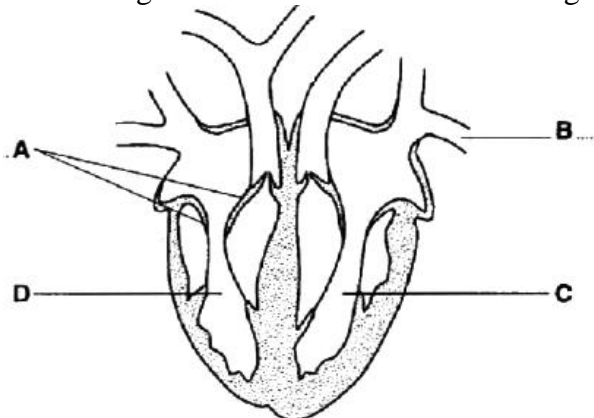
- a) Which stage is represented in the figure? 1 mark
 b) Names the structures A and B. 1 mark
 c) Describe the behaviour of chromosomes in this stage 1 marks

5. Tick the correct boxes about enzymes and digestion.

Use tick if enzyme is present and a cross where the enzyme is absent./6marks

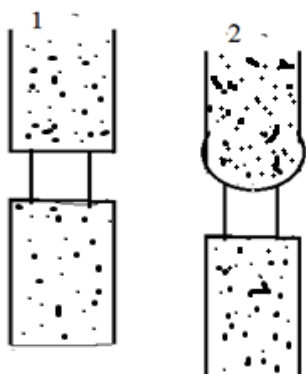
Enzyme	Enzyme produced in			
	Salivary glands	stomach	pancreas	Small intestine
Amylase				
Protease				
Lipase				

6. The figure below shows a section through the heart.



- (i) Name the parts labelled A and B /2marks
 (ii) Shade the cavity of the ventricle which contains oxygenated blood / 1mark
 (iii) Suggest why the wall around chamber C is much thicker than that around chamber D./2marks

7. The diagrams below represent an experiment carried out on the stem was set up to investigate a certain process /3marks

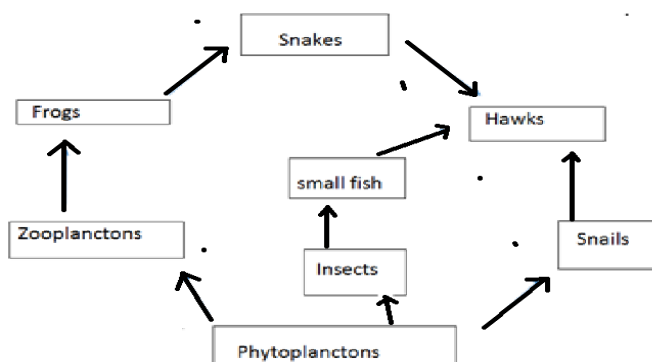


- a. Name the process that was being investigated. /1mark
- b. Give reasons for swelling in diagram 2. /2 marks

8. Of what advantage is it for a red blood cell to: /6marks

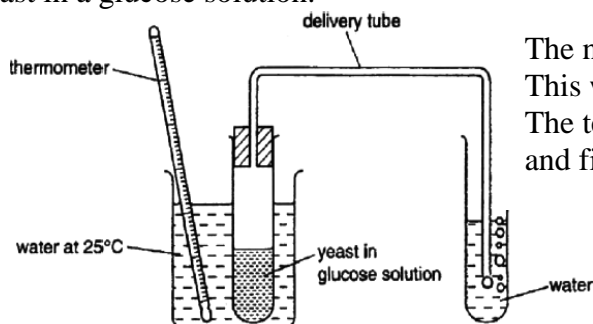
- (i) Have a biconcave disc shape?
- (ii) Have haemoglobin?
- (iii) Lack a nucleus?

9. The diagram below represents a feeding relationship in an aquatic ecosystem.



a.

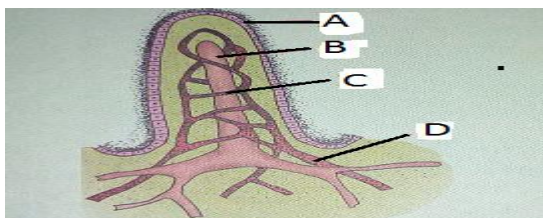
- b. Write a food chain that end with the hawk as a secondary consumer. /1mark
- c. If all frogs died, state two short-term effects on this ecosystem. / 2marks
- d. Oil spills on water bodies lead to the death of fish. Explain. /1marks
- e. Give two causes of water pollution other than oil spills. /2marks
10. The figure below shows the apparatus that was used to investigate the activity of yeast in a glucose solution.



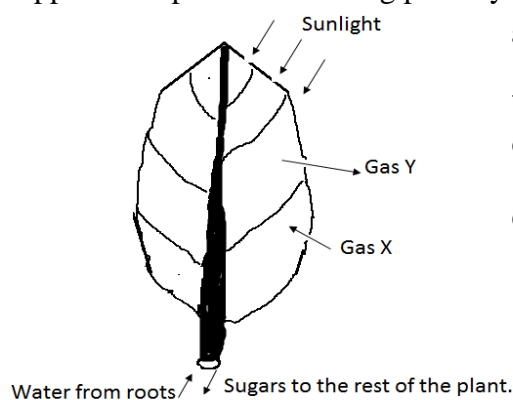
The number of bubbles released in one minute was counted. This was repeated another four times. The temperature in the water bath was then raised to 35 °C and five more counts were made.

	number of bubbles released in one minute	
	25 °C	35 °C
1	11	17
2	12	19
3	14	20
4	13	16
5	10	18
total		
mean (average)		

- (i) Complete the table to show the **totals** and **mean** (numbers of bubbles released at each temperature). /2marks
- (ii) Name the physiological process in yeast, which is investigated in this experiment. /1mark
- (iii) State the effect of raising the temperature on the activity of yeast. /2marks
- (iv) Name the gas present in the bubbles. /1mark
11. The diagram below shows the structure of a villi.

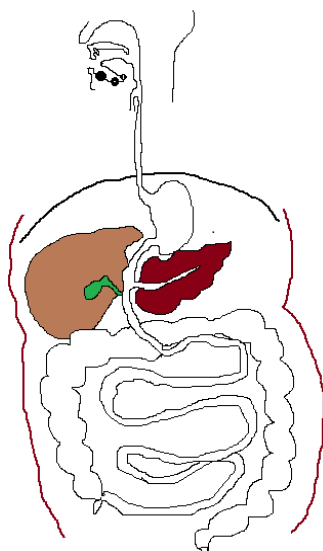


- Label the parts A, B and C. /3marks
 - Name places in human body where villi are found. /1 mark
 - How are the villi suited to their function? /3 marks
12. Leaves are the organs of photosynthesis. The following diagram shows what happens in a plants leaf during photosynthesis.



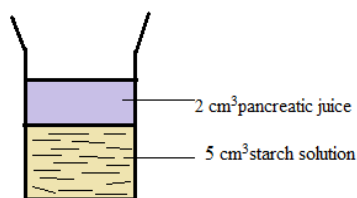
- Give three ways in which leaves are adapted to absorb light. /3marks
- Name the gases labelled X and Y. /2marks
- Name the tissues that transport water into the leaf and sugars out of the leaf. /2marks
- Explain why it is an advantage for the plant to store carbohydrates as starch rather than as sugar. / 3marks

13. The diagram below shows the human alimentary canal.



Draw this diagram and answer the questions that follow.

- On the diagram, label the salivary glands and the pancreas. / 2 marks
- b. A mixture of starch and pancreatic juice as shown on the diagram below was kept at 37°C



Pancreatic juice contains enzymes.

- i) Samples were taken from the mixture after one minute and after 10 minutes. The samples were tested for sugar and for starch. The table below shows which test proved positive and which were negative

Test	Sample 1(1minute)	Sample 2(10 minutes)
Starch test	Positive	Negative
Sugar test	Negative	Positive

Explain what caused these changes in the mixture. / **2 marks**

- ii) Experiment was repeated using pancreatic juice, which had been kept at 100°C for 10 minutes and cooled to room temperature before being added to the starch. Complete the table below to show whether you would expect each test to be positive or negative in the 10 minutes samples. / **2 marks**

Test	Sample 1(1minute)	Sample 2(10 minutes)
Starch test	Positive
Sugar test	Negative

- iii) How would you test the mixture for sugar? What would you observe if sugar were present? / **2marks**

- c. The sugar produced during digestion is absorbed from the alimentary canal through the villi.

- i) Where in the alimentary canal would find the villi? / **1 mark**

- ii) State any two feature of the villi which help it to absorb sugar quickly. / **2 marks**

- iii) Name one process by which sugars pass from the inside of alimentary canal into the blood stream. / **1 mark**

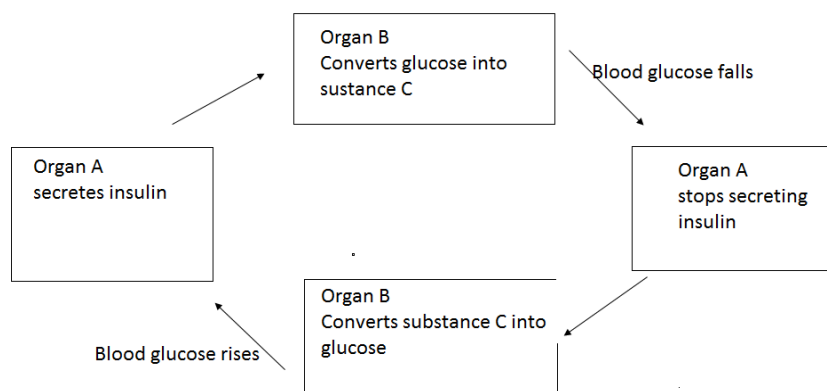
14. Explain why each of the following is a good way of stopping the spread of disease.

- covering your mouth when you cough or sneeze /**2marks**
- cooking food thoroughly/ **2m**
- washing your hands before eating/ **2marks**
- showering or bathing regularly / **2mark**
- never using a towel borrowed from a stranger /**2marks**

15. a) Why is it important to determine the blood types of the donor and the recipient? /2marks
- b) What are universal donors and universal recipients in the ABO blood system? /2marks
- c) Using your knowledge on blood transfusion, fill the table below, ticking where transfusion is permissible and crossing where it is not. Fill in all 16 squares. /8marks

RECIPIENT \ DONOR	A	B	AB	O
A				
B				
AB				
O				

16. The diagram below shows how blood sugar levels regulated in humans.



- a. What is the name for this type of control mechanism? /1mark
- b. From the diagram, identify: /1mark
- i) Organ A ii) organ B iii) substance C /3marks
- c. i) Suggest a reason why blood glucose might rise. /1mark
- ii) What process constantly removes glucose from the blood? /1mark
- iii) What would cause blood glucose levels to fall rapidly? /1mark
- d. Give two ways in which type 1 diabetes can be controlled /3mark
17. An experiment was carried out to investigate the population growth of rats in a laboratory. Twenty young of rats were placed in a cage. They were taken care of and the amount of food available to the rats each day was kept constant. The results obtained are shown in the table below.

Time (months)	Number of rats
0	20
2	20
4	65
6	115
8	310
10	455
12	450

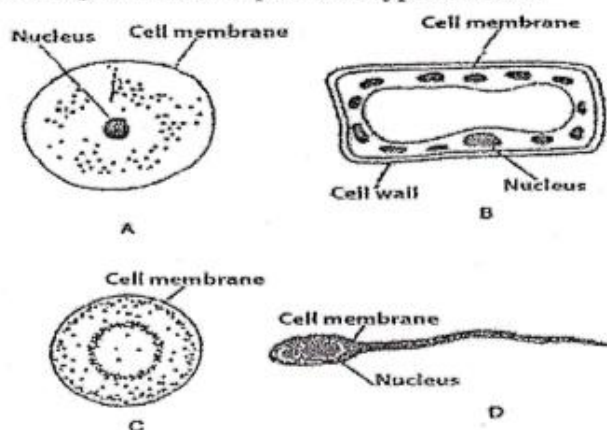
14	190
16	145
18	160

- a) Plot a graph of number of rats against time (**3marks**)
- b) With reference to the graph, account for changes in the population of rats between :
- 0 to 2 months / **2marks**
 - 2 to 10 months / **2 marks**
 - 10 to 12months / **2 marks**
 - 12 to 16 months / **2marks**
- c) Between which two months was the population change greatest. / **1 mark**
- d) State three factors that would cause a rapid human population growth. / **3 marks**

18. Choose the right arrangement in an ascending order. **3Marks**

- Gene, chromosome, cell
- Chromosome, gene, cell
- Nucleus, gene, chromosome
- Cell, gene, chromosome

The diagram below represents types of cells.



Which of these represents animal cells? Explain your answer.

(3 marks)

19. The following is a list of physiological processes. Match the physiological processes to the correct description of it. (**5Marks**)

Physiological processes	Description
A. Diffusion	I. The process by which water molecules move from a region

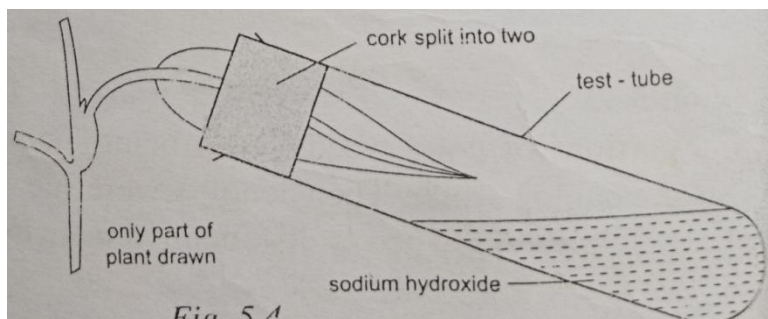
		of high concentration to a region of low concentration through a semi-permeable membrane.
B. Osmosis	II.	The process by which molecules move from a region of high concentration to a region of low concentration
C. Active transport	III.	The process by which substances move across the cell membrane against a concentration gradient.
D. Endocytosis	IV.	The process by which materials from the inside of the cell are brought to the cell surface within the membrane bound vesicle.
E. Exocytosis	V.	The process by which materials enter a cell without passing through the cell membrane.

20. Using \checkmark and \times , indicate the parts of the cell found in a plant and animal cell.

The first one has been done for you. **(5marks)**

PART	PLANT CELL	ANIMAL CELL
Nucleus	\checkmark	\checkmark
Cell membrane		
Cytoplasm		
Cell wall		
Large vacuole		
Chloroplast		

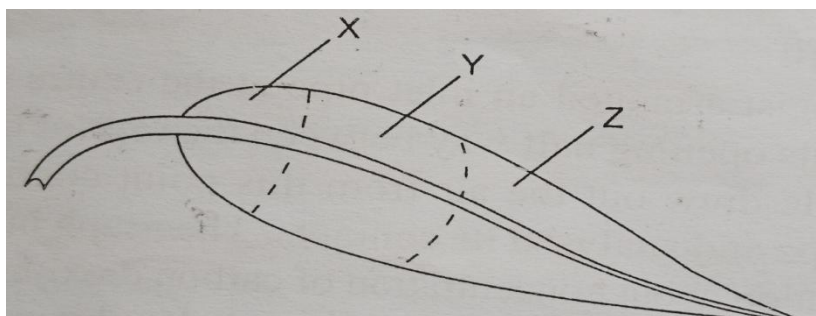
21. A potted plant with healthy leaves was kept in the dark for 48 hours. One of the leaves was then partly enclosed in a wide test tube containing sodium hydroxide. The whole apparatus was then kept in sunlight for six hours. See figure below:



(a) The apparatus set up was to demonstrate one of the necessities for the process of photosynthesis. State this necessity.

(b) Why was the plant first kept in the dark for 48 hours?

(c) The following leaf was removed from the flask after six hours.



Name the colours of the three regions X, Y and Z of the leaf after six hours.

(d) The same leaf was the tested for starch. Name the colours of the three regions X, Y and Z after the starch test.

(e) Account for the result of starch test in each of these regions X, Y and Z.

(f) Which of the three regions serves as control?

22. Complete the following statements.

- Is the movement of the molecules of gas, liquid or solute from a region of their to a region of their.....?
(3marks)
- When two solutions are separated from one another by a special selectively..... or semi- membrane, there is net movement of water molecules from a solution in which water molecules are into a solution in which water molecules are Through the special membrane. This process is known as(5marks)
- DCPIP is a reagent in colour. When is present in a food sample, the Disappears. (3marks)

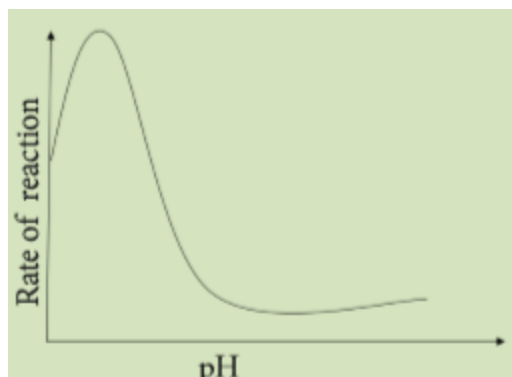
23. a) Define the term “photosynthesis” (2marks)

b) Describe the condition necessary for photosynthesis (4marks)

24. a) What are the major characteristics of enzymes? (5marks)

b) Imagine if your stomach Ph was 7 instead of the normal pH of 2; what would happen? (5marks)

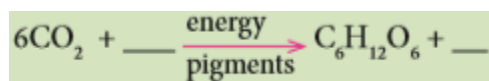
c) The graph below shows how the rate of an enzyme catalyzed reaction changes with change in Ph.



Which statement below is true? **(1mark)**

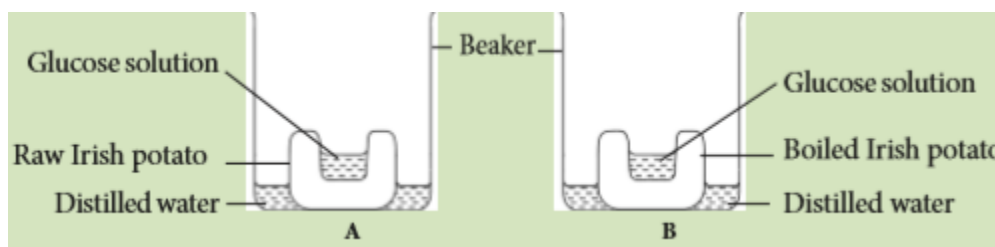
- A. The enzyme works best in alkaline conditions.
- B. The enzyme works best in acidic conditions.
- C. The enzyme is denatured at Ph 2.
- D. The rate of reaction decreases with decrease in Ph.

25. Study the equation give below.



- a) Complete the equation. **(2marks)**
- b) What is the source of energy for this reaction? **(1mark)**
- c) Name the pigment needed for the reaction to occur. **(1mark)**
- d) What is the role of this pigment in photosynthesis? **(2marks)**

26. Two potatoes were peeled. One of them was boiled. A cavity was made in each of the potatoes and the experiment was set up as shown below. The experiment was left undisturbed for 24 hours.



- a) Draw a diagram to illustrate the result in each figure. **(4marks)**
- b) Give reasons to support your answer in a) above. **(6marks)**

27. In the tables below, indicate how you carry out tests for reducing sugars and non-reducing sugars by filling in the procedure, expected observations and your logical conclusion.

- a) Test for reducing sugars**(6marks)**

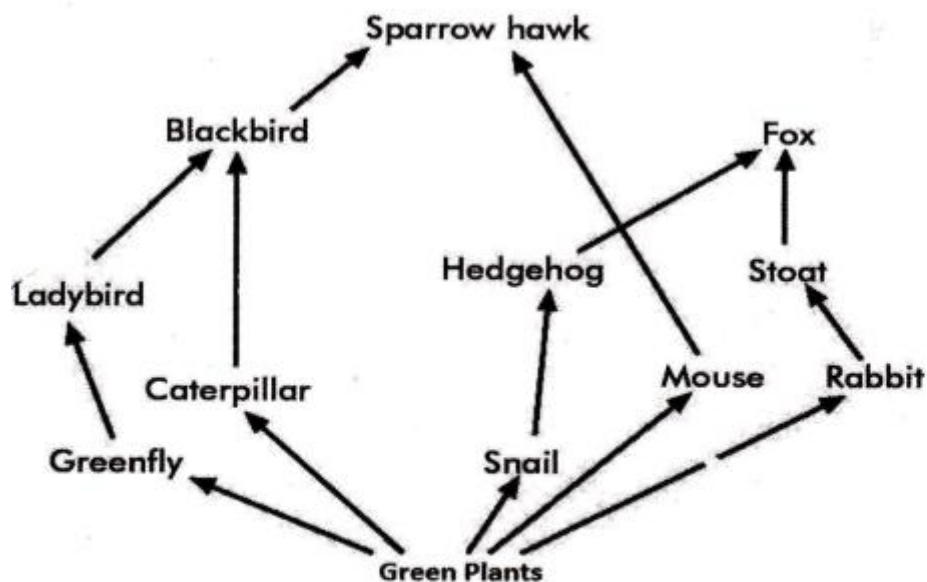
Procedure	Observation	Conclusion

b) Test for non-reducing sugars(9marks)

Procedures	Observation	Conclusion

28.

Use your knowledge of ecology to answer the following questions:



(a) What name is given to the above diagram?

(1mark)

(b) What do the arrows on the diagram mean?

(2marks)

(c) Green plants are producers. What does this mean?

(2marks)

29. a) If a nucleus measures 100 mm on a diagram with a magnification of X10 000. What is the actual size of the nucleus?

(3marks)

b) Kalisa used a microscope to observe a specimen. The eye piece had a magnification of x15 while the objective lens had a magnification of x5. After mounting the specimen, he observed nothing.

i) What went wrong?

(1mark)

ii) Calculate the magnification of the microscope used.

(2marks)

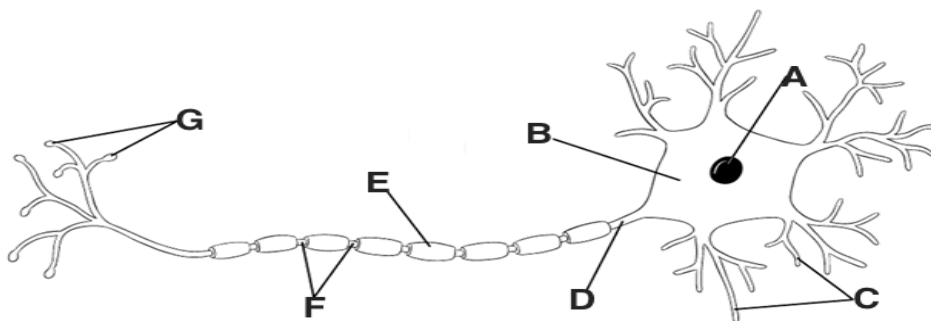
30. a) How are red blood cells (RBC) adapted to their role?

(2marks)

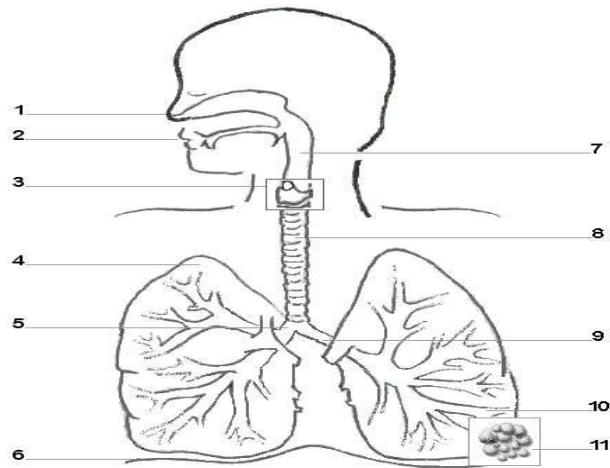
b) Arrange the following structures in increasing order/from smallest to largest:

leaf, palisade layer, transport system, bean plant, chloroplast, palisade. **(3marks)**

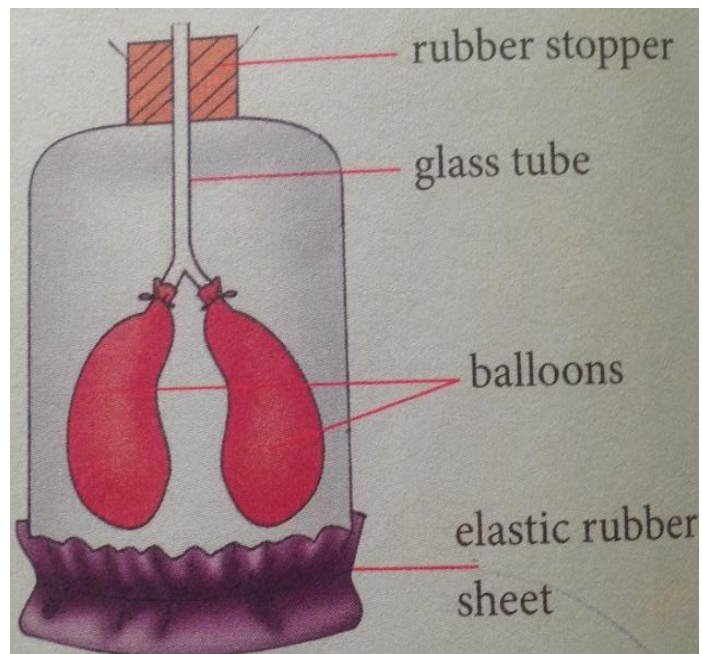
c) The diagram shows a neuron (nerve cell).



- i) Name the structures A, B, C, D, E and F. **(3marks)**
- ii) Suggest the function of C. **(2marks)**
31. A team of researchers went to a village near Rubavu and found a five-year-old boy with the following symptoms: **-loss of appetite, Irritability, Bleeding gums.**
- a) Suggest a disease the boy might be suffering from? **(1marks)**
- b) What deficiency caused the disease? **(1marks)**
- c) What advice do you think the researchers gave to the parents of the boy? **(2marks)**
- d) Write the four uses of proteins in the human body. **(2marks)**
32. a) Which of the sets below consists of respiratory gases only?
- Oxygen and argon
 - Oxygen and Carbon dioxide
 - Hydrogen and argon
 - Carbon dioxide and hydrogen **(1marks)**
- b) Study the diagram and answer to questions related to it.
- Name the parts labelled 1, 3,4,5,6,8, 10 and 11. **(4marks)**
 - What makes part 11 more efficient for gaseous exchange? **(3marks)**



c) Study the model below



i) Name the structure represented by: a) Elastic rubber sheet

b) Balloons

c) Glass tube (3marks)

ii) If the elastic rubber sheet is pulled down, what result you expect to happen? Give reasons. (2marks)

33. a) State four reasons why food is important to the body. (2marks)

b) Complete the following table.

Food substance lacking in the diet	Deficiency disease
Calcium
.....	Scurvy
	Night blindness
B1
Iodine
Iron
.....	Pellagra
Vitamin D

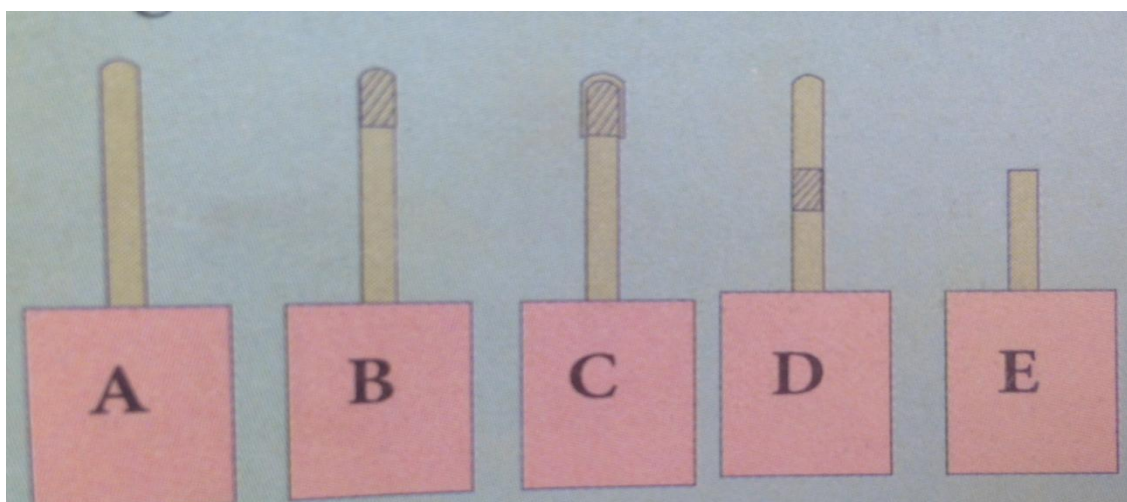
(4marks)

34. a) Describe the functions of roots and leaves for the plant. (4marks)

b) Give any two types of modified stems and give one example for each. (2marks)

c) Make a well labeled drawing of a flowering plant. (4marks)

35. The following shows an experiment which was carried out to investigate the response of shoot tips (coleoptile) of a maize seedling to unidirectional light.



- In pot **A**, the tip of the plant was allowed to grow freely.
- In pot **B**, the coleoptile was covered with an Aluminium foil.
- In pot **C**, the coleoptile was covered with a transparent material.
- In pot **D**, the coleoptile was covered a few centimetres from the tip with aluminium foil.
- In pot **E**, the coleoptiles tip was cut.

a. i) Account for the observation made in A. **(1mark)**

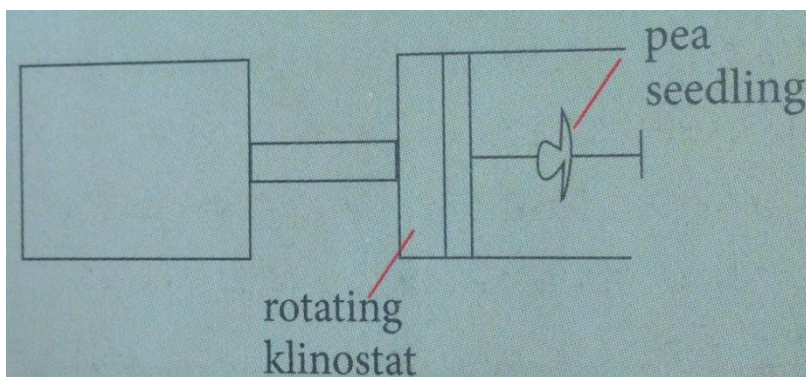
ii) Name the tropism demonstrated by A. **(1mark)**

iii) What is the difference in response between seedlings B and C? **(2marks)**

iv) Account for the observations in seedling D after 7 days. **(2marks)**

v) What was the purpose of seedling E? **(1mark)**

b. In an experiment, a pea seedling was pinned on a rotating klinostat as shown in the diagram below.



Another seedling was pinned on a stationary klinostat with its roots facing upwards.

i) Describe using a suitable illustration the direction of growth of the shoots and the roots of the two seedlings after 7 days. **(2marks)**

ii) What was the purpose of using a rotating klinostat? **(2marks)**

iii) What response is being investigated in the above experiment? **(1mark)**

c. Explain the role of auxin hormone in phototropism. **(3marks)**