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Total Score

Name.....

School.....

Roll No.....

Republic of Somaliland

Somaliland National Examination Board

Form Four

BIOLOGY EXAMINATION

June 2010

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 18 printed pages

Count them now. Inform the invigilator if there are any missing or extra pages.

There are two parts:

PART 1:	20 Multiple Choice Questions	30 Marks
PART 2:	8 Structured Questions	70 Marks

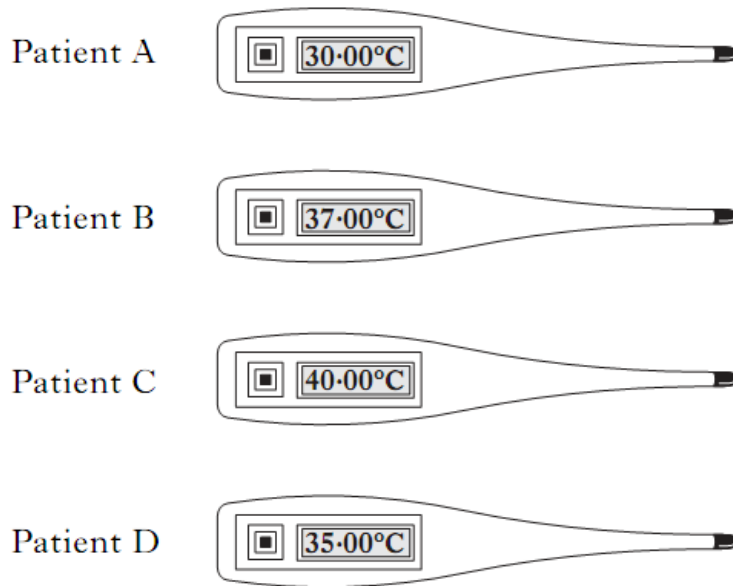
TOTAL 100 Marks

- Answer all questions in part 1 and 2.
- No extra paper is allowed

PART 1: (20 Questions @ 1.5 marks each= 30 Marks): Answer All questions.

➤ **Answer all questions in this section. For each question in this section, circle the correct answer**

1. The diagrams of digital thermometers below show the temperatures of four patients in a hospital. Which patient is most likely to be suffering from fever?



2. Human blood group are determined by
- A. Genes
 - B. Allele
 - C. Nucleotides
 - D. Chromosomes
3. Plasmolysis takes place when a cell is kept in
- A. isotonic environment
 - B. hypertonic environment
 - C. hypotonic environment
 - D. distilled water

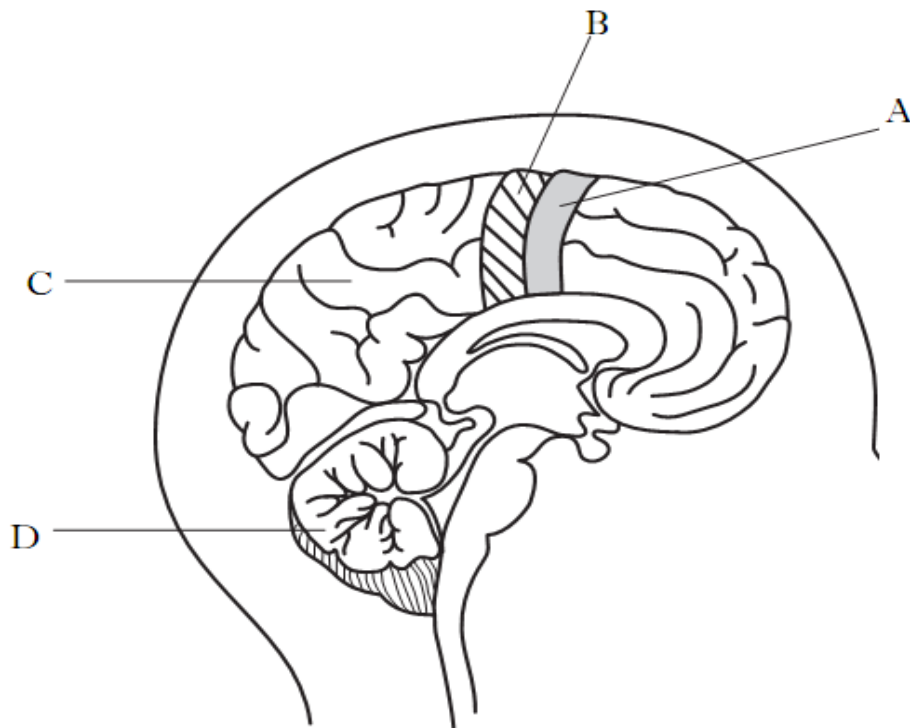


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4. Which line in the table below correctly matches the food group to its use?

	Food Group	Use
A	Fats	Growth and repair of cells
B	carbohydrates	energy
C	proteins	protection against deficiency disease
D	vitamins	energy

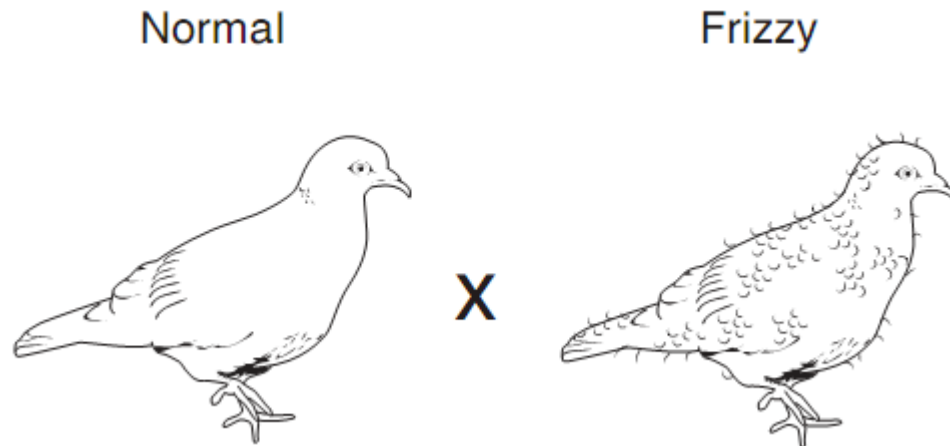
5. The diagram below shows a side view of the human brain. Which label identifies correctly the part of the brain which controls balance?



6. The use of micro-organism to solve practical human problems in food , medicine , farming and environment is called

- A. biodiversity B. biotechnology
C. biometry D. biochemistry

7. In pigeons the allele for male normal feathers (F) is dominant to the allele for frizzy feathers (f).



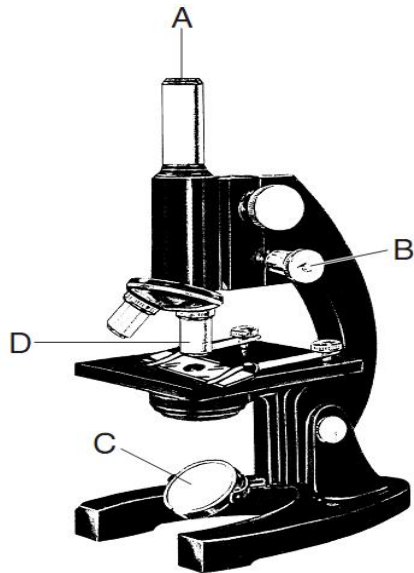
If a purebred, normal-feathered bird (FF) is crossed with a frizzy-feathered bird (f f), how many different feather phenotypes are possible in the offspring?

- A. 1
 - B. 2
 - C. 3
 - D. 4
8. Skin colour in humans is an example of
- A. discontinuous variation
 - B. co-dominance
 - C. polygenic inheritance
 - D. random assortment



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9. The diagram below shows a simple microscope. Four parts of the microscope are labelled A,B,C, and D.



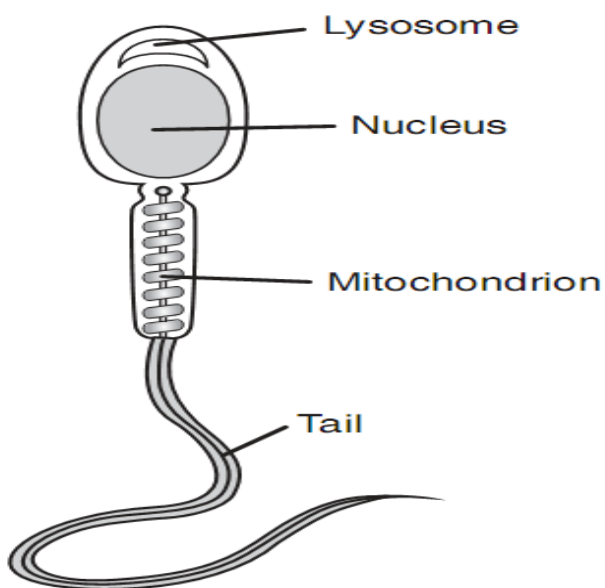
Which part of the microscope is used to bring the image of the object on the slide into focus?

- A
- B
- C
- D

10. Many cells have a nucleus that contains chromosomes. These chromosomes carry genes that are composed of

- A. hormones
- B. DNA molecules
- C. minerals and water
- D. undigested food molecules

11. The diagram below shows a male gamete.



Which structure stores MOST of the genetic information?

- A. mitochondrion
- B. lysosome
- C. nucleus
- D. tail

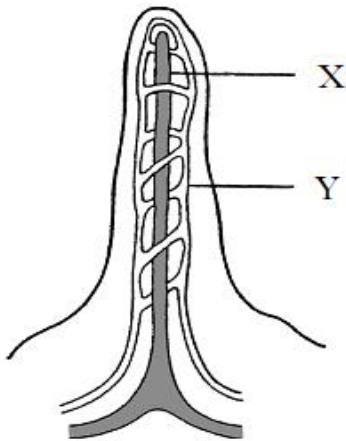
12. Below are symptoms of a certain disease

- ★ mild fever show by raise in temperature
- ★ coughing especially after working
- ★ sweating at night
- ★ loss of weight

Which disease has the above symptoms?

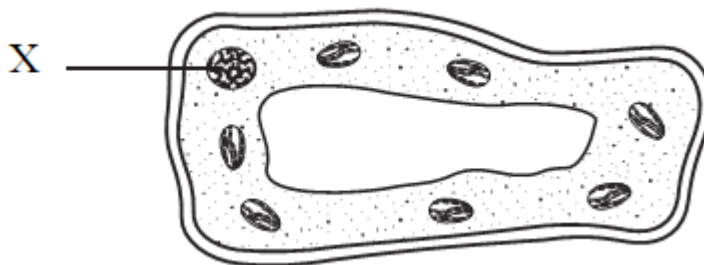
- A. TB B. Malaria C. Typhoid D. Cholera

13. The diagram below shows some structures in a villus. Which line in the table below correctly identifies the products of digestion which pass into structures X and Y?



	X	Y
A	glucose	amino acids
B	glycerol	fatty acids
C	Amino acids	glycerol
D	Fatty acids	glucose

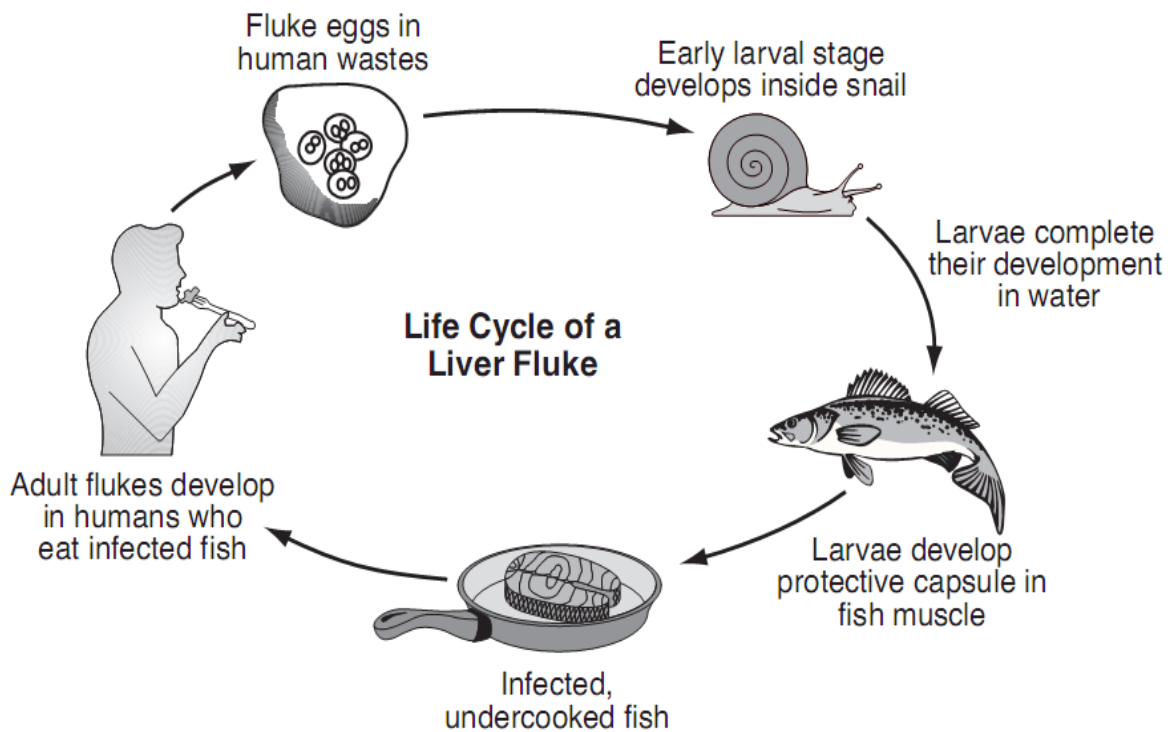
14. The diagram below shows a cell.



The function of structure X is to

- A. control cell activities B. keep the cell turgid
C. control entry and exit of material D. release energy from glucose

15. The diagram below shows the life cycle of a liver fluke.

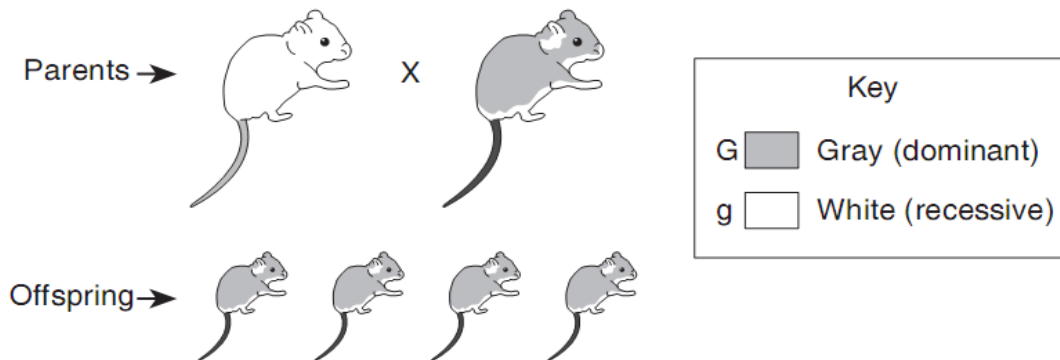


This diagram shows that the liver fluke

- A. depends on other organisms for survival
- B. dies when it enters the fish
- C. completes its life cycle in the snail
- D. survives at very high temperatures

Base your answers to questions 16 and 17 on the diagram below.

The diagram shows the offspring of a white mouse and a gray mouse. All of the offspring are gray.



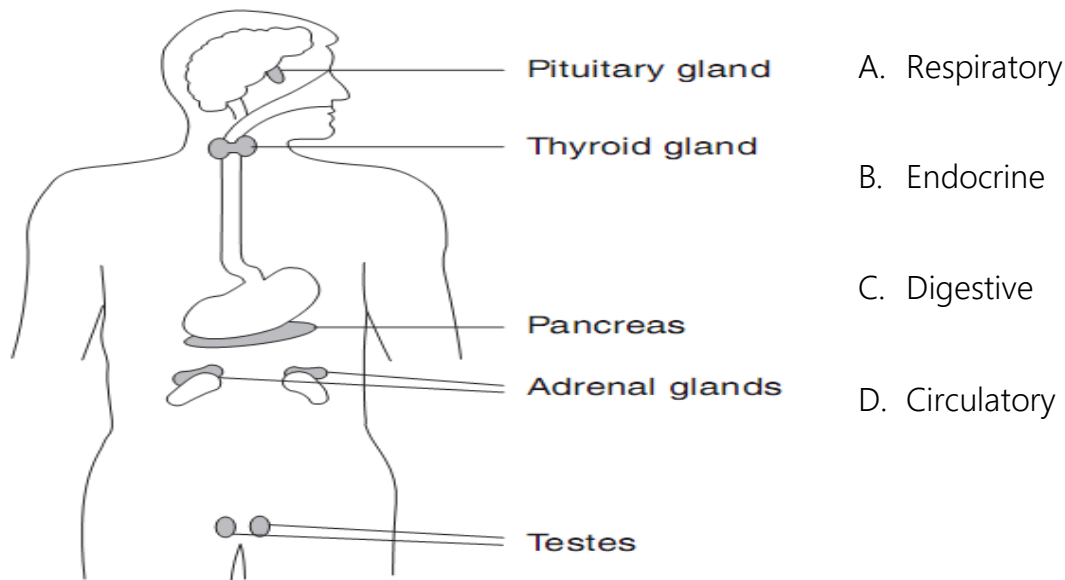
16. Which is a correct gene combination for the parents shown in the diagram?

- A. GG x GG B. gg x gg C. gg x GG D. Gg x Gg

17. If two gray (Gg) mice mated, what percent of their offspring would have pure white fur?

- A. 25 % B. 50 % C. 75 % D. 100 %

18. The labelled organs in the diagram below are part of which human body system?



19. The drawings below show four animals.



Worm



Spider



Cat

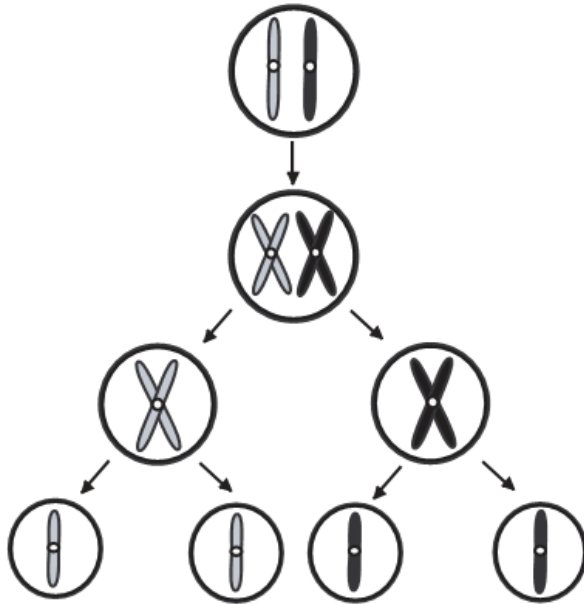


Crab

What do all four animals have in common? They

- A. reproduce asexually B. are composed of cells
C. have similar means of locomotion D. have the same internal structures

20. The diagram below shows a cellular process that occurs in organisms.



This process is known as

- A. meiosis
- B. mitosis
- C. endocytosis
- D. phagocytosis

PART 2: STRUCTURED QUESTION

70 MARKS

QUESTION 1. (12 marks)

ATP is used as a temporary energy store and supplies energy to carry out various cellular activities

a) Give three reasons why cells use ATP rather than glucose as a universal currency in cell during cellular metabolism by comparing them.

ATP	GLUCOSE
1	1
2	2
3	3

6 marks

b) i)- ATP is mainly produced in mitochondria during aerobic respiration. Give the term that describes this process. 2 marks

.....
.....

ii)- Name one other process which can also produce ATP molecules on plants 1 mark

.....

c) State three ways in which an antigen can conceal from the antibody. 3 mark

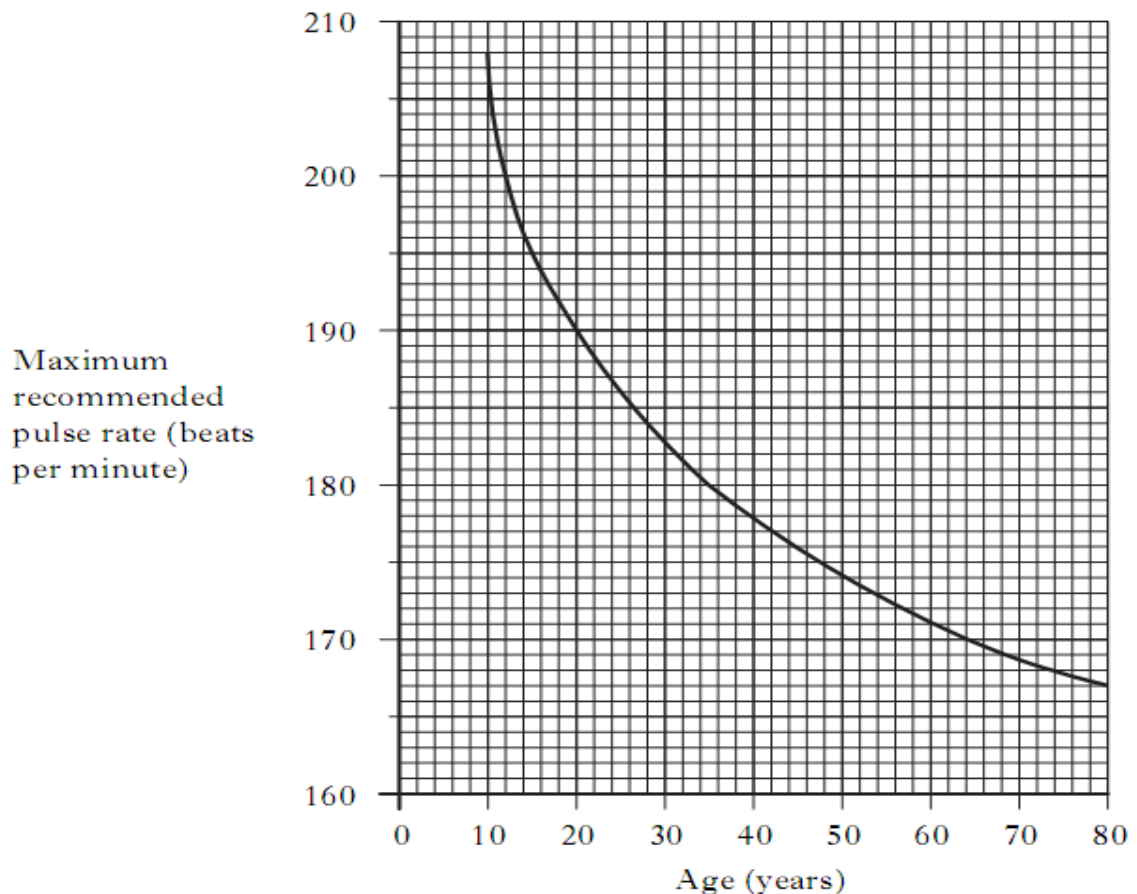
i)-

ii)-

iii)-

QUESTION 2 (13 MARKS)

A) The graph shows the maximum recommended pulse rate for humans of different ages.



a) What is the maximum recommended pulse rate for a person aged 15 years?
..... (1 Mark)

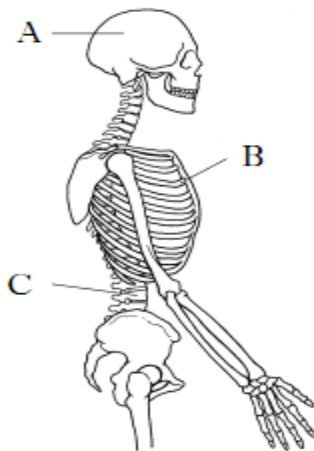
a) At what age does the maximum recommended pulse rate fall below 200 beats per minute?(1 Mark)

b) Calculate the percentage decrease in the maximum recommended pulse rate between the ages of 20 and 60 years.

.....
.....
.....

.....(3 Marks)

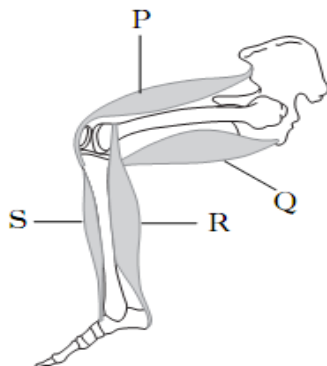
B) The diagram shows part of a human skeleton.



Complete the table below to name the part of the skeleton labelled on the diagram and name ONE organ protected by that part. (6 Mark)

Letter	Part of skeleton	Organ protected
A		
B		
C		

C) The diagram shows some of the muscles in a human leg.



i) Which muscle contracts to straighten the leg?

.....

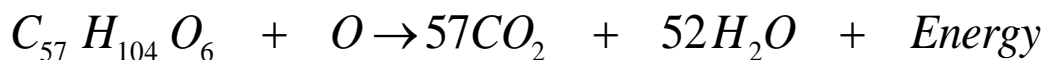
ii) What is the name of the structures which attach the muscles to bones?

.....

(2 Marks)

QUESTION 3 (4 Marks)

A) The chemical equation shown below is the oxidation of a certain food substance.

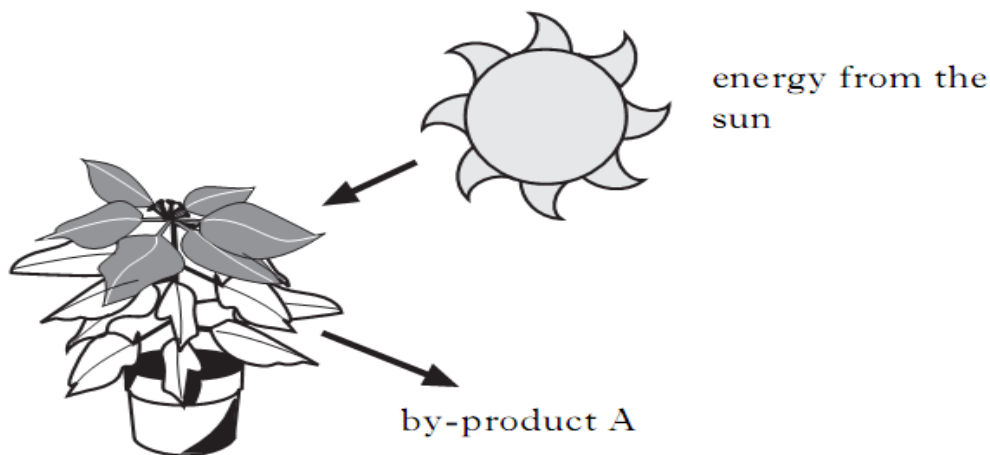


Calculate the respiratory quotient of the process 4 marks

.....
.....
.....
.....

QUESTION 4 (8 Marks)

A) Photosynthesis is the process by which green plants make glucose using energy from the sun.



a) Name the by-product A released during photosynthesis.

..... (1 Mark)

b) Hydrogen and a high energy molecule are produced during photosynthesis.

i) Name the high energy molecule.

..... (1 Mark)

ii) Describe the use of hydrogen in carbon fixation.

.....
.....(2 Marks)

c) i) Explain why an increase in temperature can lead to an increase in the rate of photosynthesis.

.....
.....
.....(2 Marks)

ii) Other than temperature, state TWO limiting factors of photosynthesis.

.....
.....(2 Marks)

QUESTION 5 (6 Marks)

a) In Africa grasslands impala, giraffe and zebra feed on Acacia trees. Impala and zebra also graze on grasses.

Acacia



impala



giraffe



zebra



i) State one way that competition for food is reduced between zebras and giraffes.

.....(2 Marks)

ii) The Acacia tree is adapted to withstand long periods of drought. Suggest an adaptation that Acacia tree show that allows it to survive long dry periods.

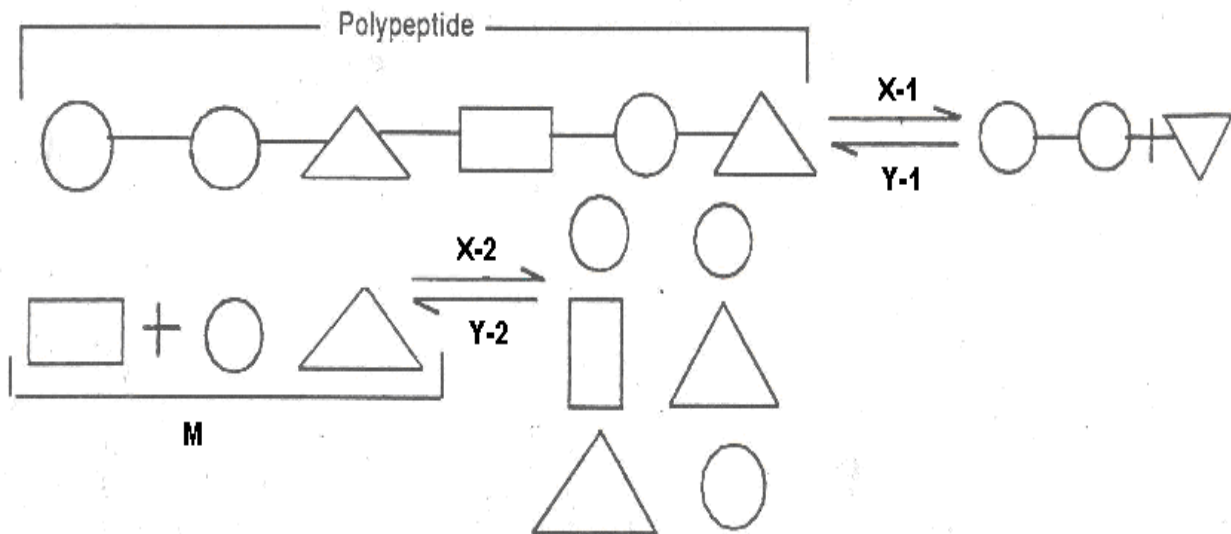
..... (2 Marks)

iii) In Erigavo grasslands, sheep are often found as grazers. A very large flock of sheep was introduced into the area of ungrazed grasslands. Explain why this would decrease biodiversity within this area.

.....
.....
.....(2 Marks)

QUESTION 6 (8 marks)

a) The figure below is a schematic representation of the break down of a protein molecule



a) Name the process (2 marks)

- i) X-1 and X-2
- ii) Y-1 and Y-2

b) Identify the product M (2 marks)

M :.....

c) State the smallest product of the above diagram (2 marks)

.....

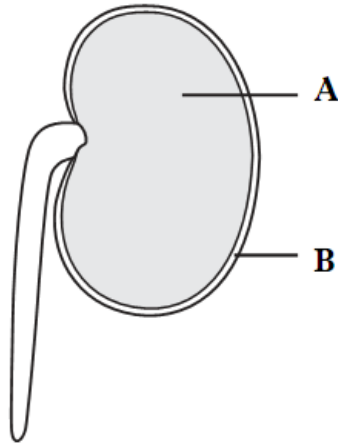
d) Name the bond which holds together molecules M (2 marks)

.....

.....

QUESTION 7. (8 Marks)

a) The diagram shows a germinating kidney bean seed.



Use the diagram to complete the following table.

Label	Name	Function
A		Provides energy for growth
B	Seed coat	

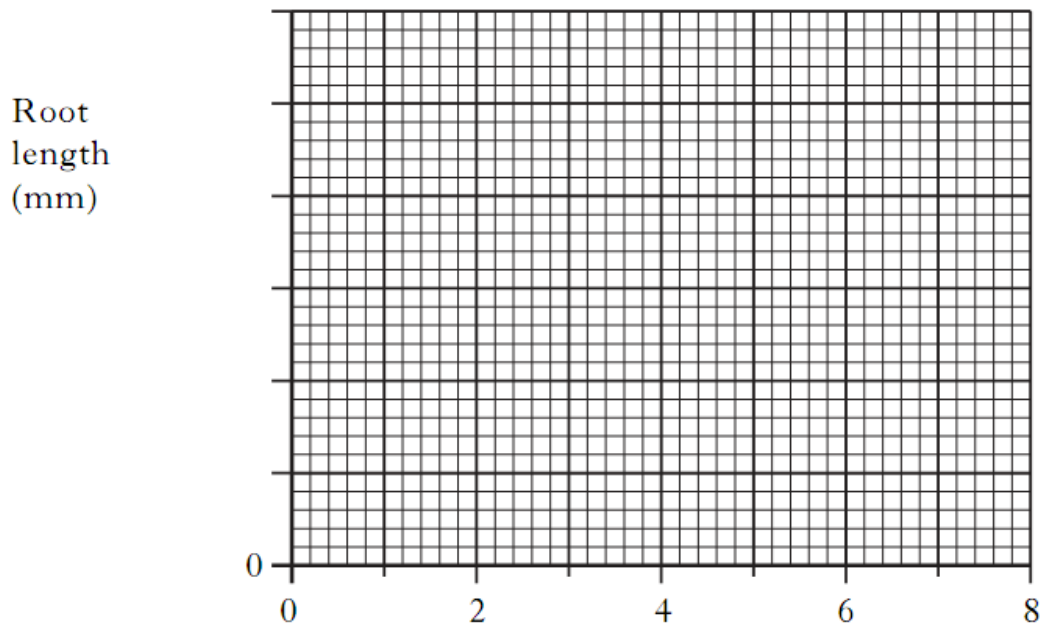
(2 Marks)

b) The root length of the germinating kidney bean seedling was measured every two days. The results are shown in the table below.

Time (days)	Root length (mm)
0	0
2	4
4	8
6	18
8	27

i) On the grid provided, complete the LINE GRAPH by

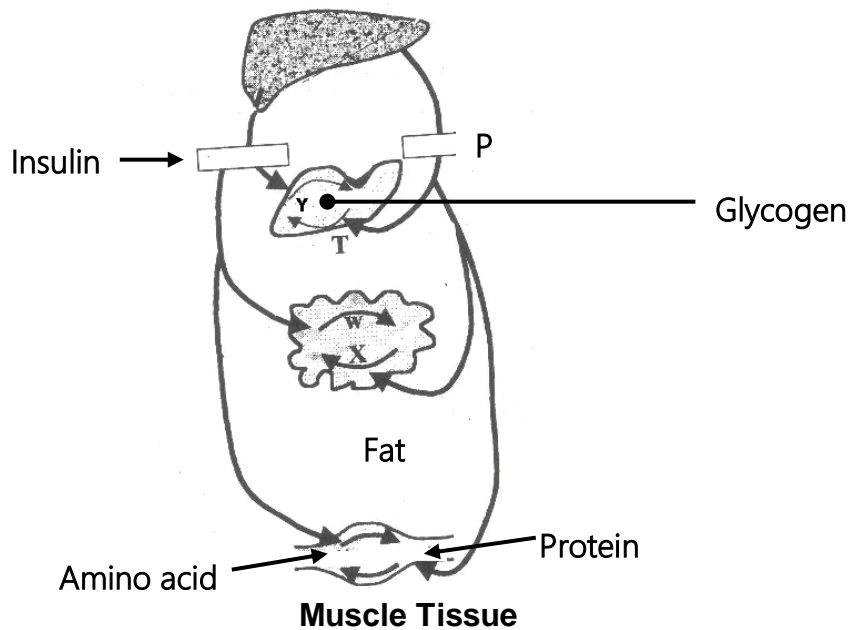
- a) providing a label for the horizontal axis (1 Mark)
- b) completing the scale on the vertical axis (1 Mark)
- c) plotting the results (3 Marks)



ii) Between which TWO days was there the greatest increase in root length?
.....(1 Mark).

QUESTION 8 (11 marks)

The diagram below shows the homeostatic system concerned with the regulation of blood sugar level. Use it to answer the question the follow.



a) Name the hormone labelled P and the organ labelled T 2mark

Hormone P :.....

Organ T:

b) Name the substance Y which is being converted into the product shown
in the organ 2mark

.....

.....

.....

c) Name the process by which the precursors labelled X and W are converted into the
product shown in the diagram 2mark

gluconeogenesis.....

.....

d) State the condition of the blood which enhances the production of insulin 2mark

.....

.....

.....

e) Name the cells of the pancreas which produce the hormone labelled (P) and insulin. 2mark

.....

.....

f) Apart from the two hormones produced by the pan crease, name three other
substances which are contained in the pancreatic secretions upon stimulation by the
hormone secretion. 3 marks

.....

.....

.....

END