

MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2017

BIOLOGY



P/LAND NATIONAL EXAMINATION BOARD

MINISTRY OF EDUCATION AND HIGHER EDUCATION
PUNTLAND NATIONAL EXAMINATIONS BOARD

Code Number

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FORM FOUR EXAMINATION 2017
Time 2 hours AND 10 minutes for reading

BIOLOGY

Instructions to candidates

- Answer all the questions
- This paper consists of 15 pages, count it and if any is missing inform your invigilator
- Do not write your **name and roll number** on the exam paper
- Make sure that **student's profile** is attached to the exam paper, if not, inform you invigilator.
- No extra paper is allowed. Rough work can be done on page 1. This will not be marked.
- If you make a mistake, **cross out the incorrect** answer and **write your correct answer**.

This exam paper consists of following Sections

Sections	Marks
Section A : Multiple Choice	10 marks
Section B: Structured Question	90 marks
TOTAL: 100 MARKS	

For the markers only

SECTIONS	MARKS
Section A	
Section B	
TOTAL	%



SOM EXAMS

SECTION A: MULTIPLE CHOISE QUESTIONS

10 MARKS

Circle the correct answer

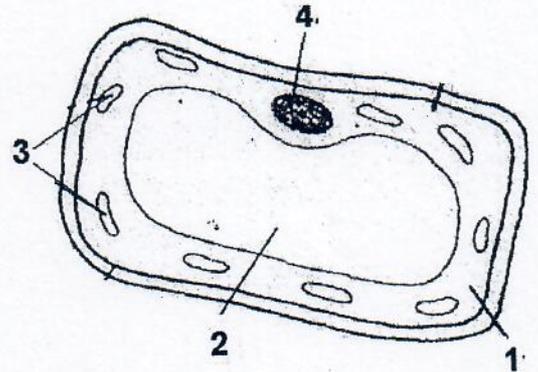
1. Scurvy is caused by lack of

- A) Vitamin A
- B) Vitamin B

- C) Vitamin C
- D) Vitamin D

2. The diagram below shows a plant cell in which part does photosynthesis takes place?

- A) 1
- B) 4
- C) 2
- D) 3



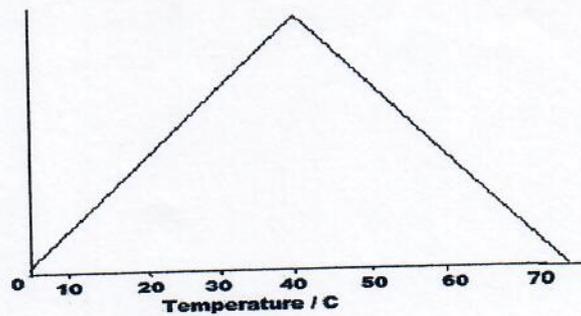
3. Which chemical element is found only in proteins?

- A) Carbon
- B) Hydrogen

- C) Nitrogen
- D) Oxygen

4. The graph below shows the effect of temperature on the activity of an enzyme. What is the optimum temperature?

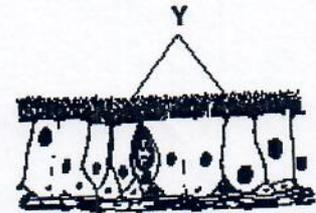
- A) 10 °C
- B) 40 °C
- C) 0 °C
- D) 70 °C



5. The diagram below shows some cells from the lining of the trachea in the respiratory tract.

What is the function of the structures labeled Y?

- A) Moving mucus
- B) Absorbing oxygen
- C) Killing microorganisms
- D) Trapping bacteria



6. The chemical needed for testing glucose is

- A) Biuret solution
- B) Benedict's solution
- C) Iodine
- D) Ethanol

7. The table below shows the blood groups of 200 students.

What percentage of students had blood group AB?

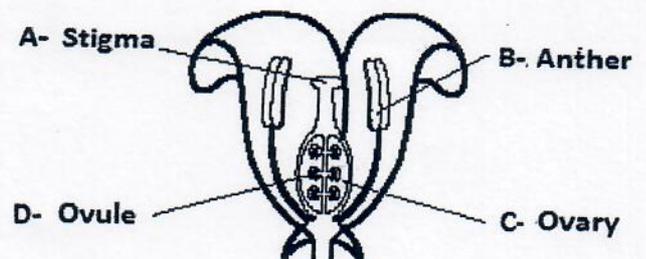
- A) 3%
- B) 6%
- C) 12%
- D) 53%

Blood group	Number of students
O	94
A	84
B	16
AB	6

8. Which of the following shows the correct DNA base pairing

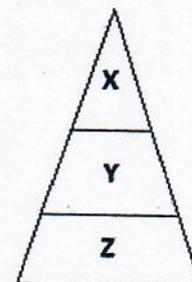
- | | | | |
|--------------|--------------|--------------|--------------|
| A A-C | B A-T | C A-G | D A-T |
| C-G | C-G | C-G | C-G |
| G-C | G-T | G-A | G-C |
| T-A | T-A | T-A | T-A |

9. The diagram below shows the structure of a flower, where are the male gametes produced?



10. There is a lot less energy at level X in the pyramid because

- A. there are fewer organisms at this level
- B. energy is stored at each level
- C. energy is lost at each level
- D. the organisms are bigger at this level



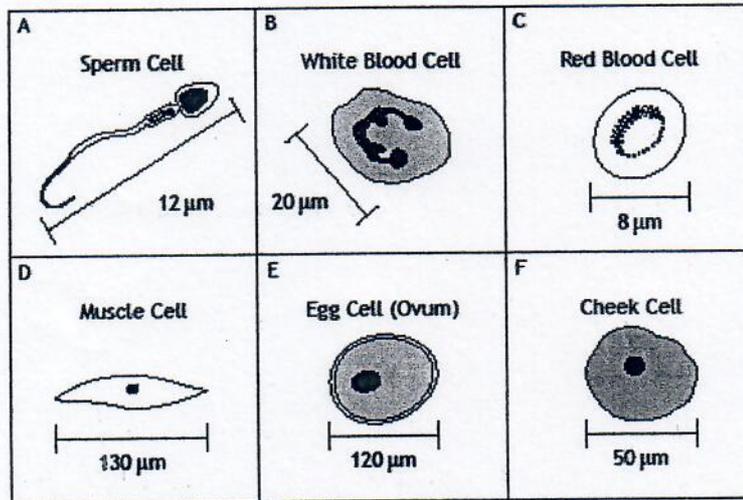
SECTION B: STRUCTURE QUESTIONS

90 MARKS

QUESTION ONE: INTRODUCTION TO BIOLOGY

5 MARKS

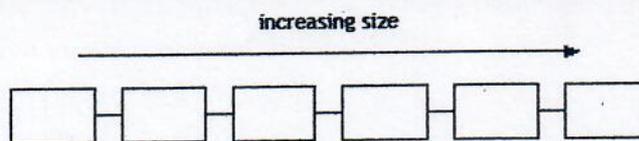
a) The diagrams below show examples of some types of specialized cells from the human body.



The cells are not drawn to the same scale.

(μm = micrometre)

a) Put letters in the boxes below to arrange the cells in order of size. 3 MARKS



Choose one of the following cell types by circling it.

Sperm cell

egg cell

red blood cell

ii) Describe the function of the chosen cell and explain how its specialization allows it to carry out that function.

Function

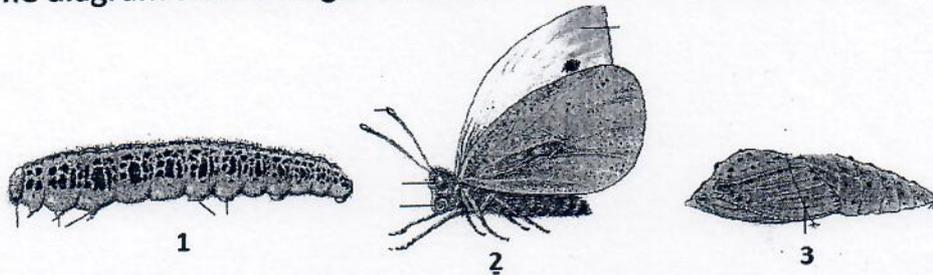
2 Marks
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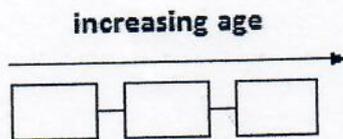
QUESTION TWO: DIVERSITY OF ORGANISM

7 MARKS

The diagram shows stages in the life cycle of white butterfly



a) Put numbers in the boxes below to arrange life cycle in order of age. 3MARKS



b) Plants can be divided into shoot and root system. to what directional stimuli do these respond

I) Roots

1 Mark

II) Shoots

1 Mark

c) Name the plant organs which are

I) Positively phototropic

1 Mark

II) Positively geotropic

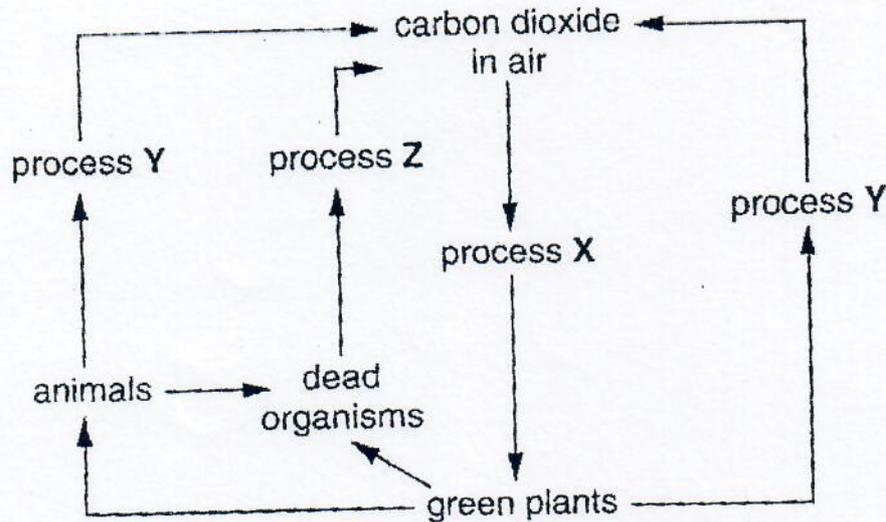
1 Mark



QUESTION THREE: ECOLOGY AND ECOSYSTEM

9 MARKS

This is a diagram of the carbon cycle.



a) Name the process X and Y

X. _____ 1 Mark

Y. _____ 1 Mark

b) How does carbon transfer from green plants become part of the body of an animal?

 _____ 2 marks

c) How does carbon in coal become part of carbon dioxide in air?

 _____ 2 marks

d) What environmental problem does this carbon dioxide cause?

 _____ 2 Marks

e) Define the meaning of "ecology"?

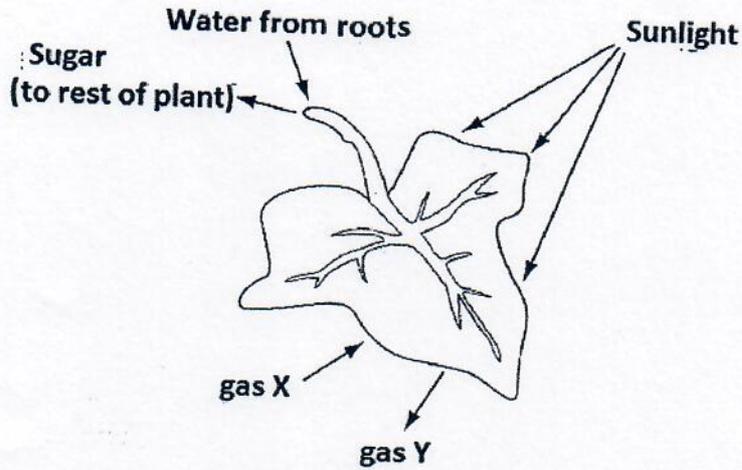
 _____ 1 Mark



QUESTION FOUR: PLANTS

11 MARKS

The diagram below shows a plant leaf during photosynthesis



- a) Name
 - i) Gas X _____ 1 Mark
 - ii) Gas Y _____ 1 Mark
- b) Name the tissue that transports:
 - i) Water into the leaves
_____ 1 Mark
 - ii) Sugar out of the leaf
_____ 1 Mark
- c) State the raw materials of photosynthesis.

_____ 3 Marks
- d) Why sun light is necessary for photosynthesis?

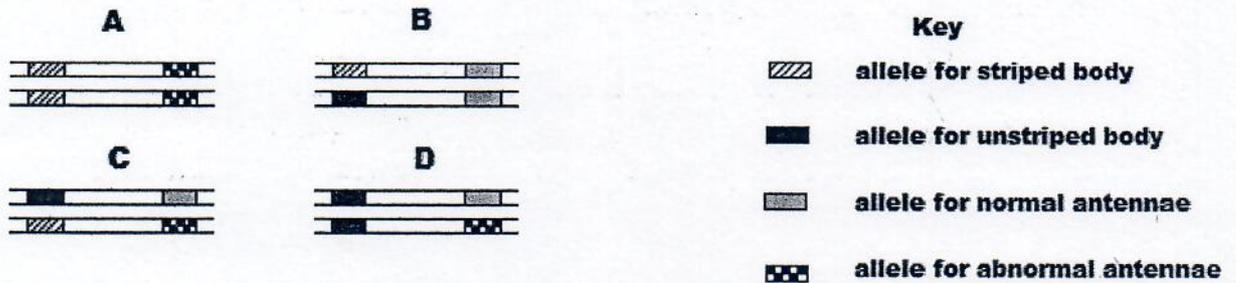
_____ 2 Marks
- e) Name the green chemical which plants need to carry out photosynthesis.
_____ 2 Marks



QUESTION FIVE: GENETICS AND INHERITANCE

14 MARKS

The diagrams below show the same sections of matching chromosomes found in four flies, A, B, C and D



- a) Which fly is
- i) Homozygous for body pattern and heterozygous for antennae type?
_____ 2 Marks
 - ii) Heterozygous for body pattern and heterozygous for antennae type?
_____ 2 Marks
 - iii) Homozygous for body pattern and homozygous for antennae type?
_____ 2 Marks
- b)
- i) What is mutation?

_____ 2 Marks
 - ii) Give one cause of mutations
_____ 1 Mark
 - iii) Use the correct words '*Homozygous dominant, Heterozygous* and *Homozygous recessive*' to describe the following gene combinations
Aa , AA, aa.
Aa _____ 1 Mark
AA _____ 1 Mark
aa _____ 1 Mark
- c) Where would you expect meiosis to be taking place in
- i) Human male _____ 1 Mark
 - ii) Human female _____ 1 Mark



QUESTION SIX: HUMAN PHYSIOLOGY- CIRCULATORY SYSTEM 5 MARKS

The boxes below show parts of the circulatory system

A	Vein	B	red blood cell	C	plasma
D	valve	E	white blood cell	F	artery

Which part

a) Prevents blood from flowing backwards?

Letter _____ 1 Mark

b) Carries blood back to the heart?

Letter _____ 1 Mark

c) Protects the body by destroying bacteria?

Letter _____ 1 Mark

d) Contain approximately 90% water

Letter _____ 1 Mark

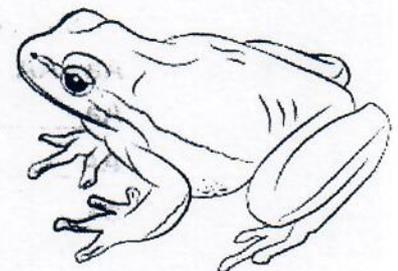
e) Carry oxygen

Letter _____ 1 Mark

QUESTION SEVEN: TAXONOMY

4 MARKS

The diagram below shows a frog.



a) Where frog does uses its gaseous exchange?

_____ 1Mark

b) How many leg does frog has?

_____ 1 Mark

c) Name it's phylum

_____ 1 Mark

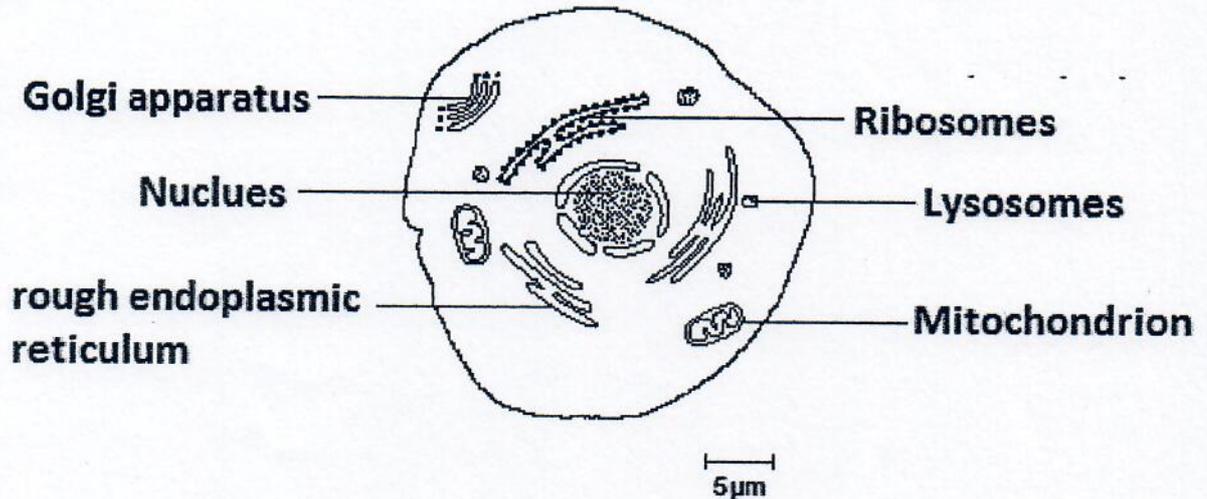


QUESTION EIGHT:

CELL BIOLOGY

5 MARKS

In the following diagram of an animal cell, cell structures are labelled A–G.



Select one organelle from picture which is most closely associated with each of the following cell processes:

a) it's largest cell organelle(controls cell)

_____ 1 Mark

b) site of aerobic respiration which make ATP

_____ 1 Mark

c) are site of protein synthesis

_____ 1 Mark

d) responsible for the digestion of unwanted structure

_____ 1 Mark

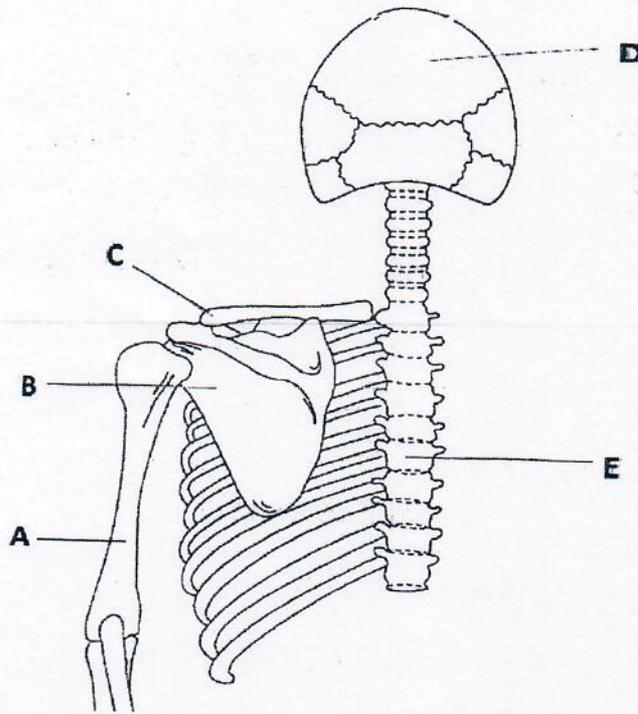
e) are used to make lysosomes

_____ 1 Mark



QUESTION NINE: HUMAN PHYSIOLOGY- SKELETAL SYSTEM 6 MARKS

The diagram below shows part of human skeleton viewed from behind.



a) Name the parts labeled D and E

D _____ 1 Mark

E _____ 1 Mark

b) Explain the function of part D?

_____ 2 Marks

c) Name the type of joints found at the shoulder?

_____ 2 Marks



QUESTION TEN: HEALTH AND DISEASES

12 MARKS

Some common diseases are listed below

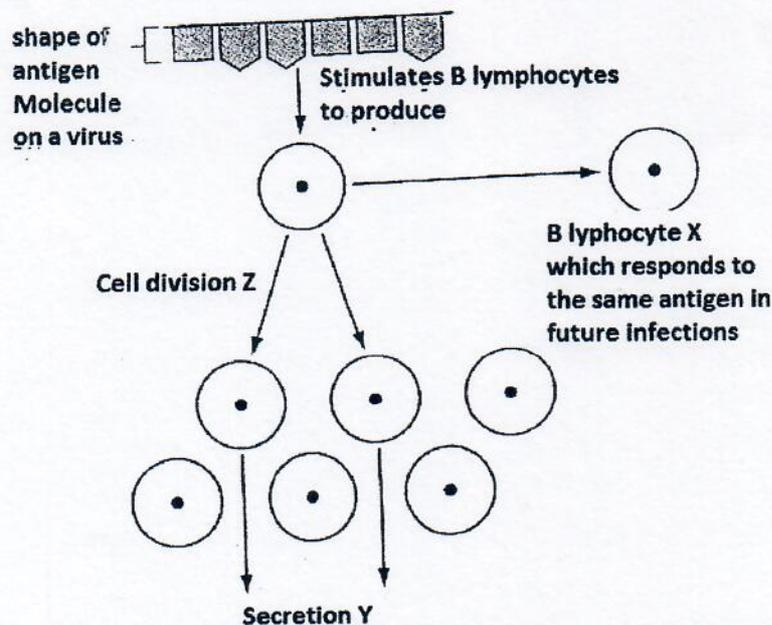
10 Marks

Typhoid	Malaria	whooping cough	Measles
syphilis	sleeping sickness	athletes foot	
cholera	Aids	ringworm	

a) Classify the type of organism that causes each of the above diseases

Microbes	Diseases
1. Bacteria	
2. Virus	
3. Fungus	
4. Protozoa	

The following diagram show how immune response is stimulated by antigen



Identify

- I) The type of cell division at Z _____ 1 Mark
- II) The product secreted at Y _____ 1 Mark



QUESTION ELEVEN:

BIOTECHNOLOGY

4 MARKS

Complete the sentence below by putting the correct words from list

Biotechnology Fermentation Bacteria Yeast

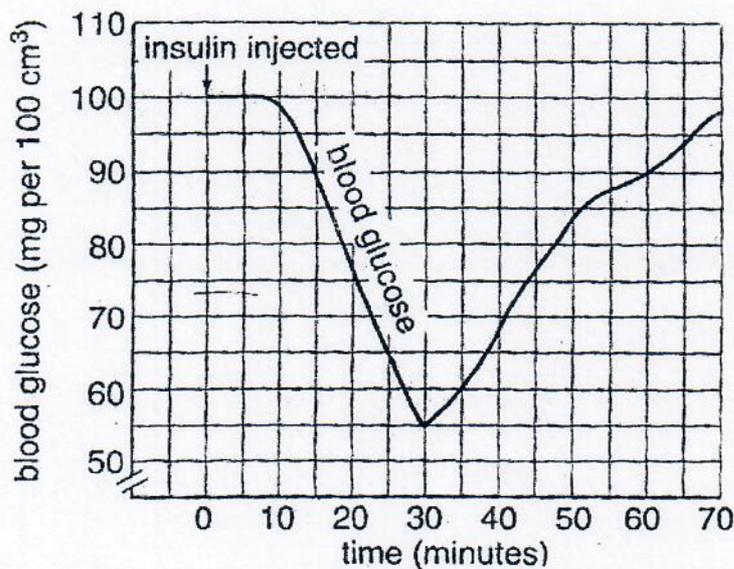
- a) The pasteurized milk is then fermented by adding of _____
- b) The process which can sugar can be converted into alcohol _____
- c) The application of biological organism _____
- d) The micro-organism used in bread-making _____

QUESTION TWELVE

ENDOCRINE SYSTEM

8 MARKS

The graph below shows the effect of injecting 1 unit of insulin into a person. The concentration of glucose in the blood was measured at regular intervals.



- a) What was the lowest value of blood glucose?

1 Mark

- b) At what time was recorded when blood glucose is 90 mg/cm³

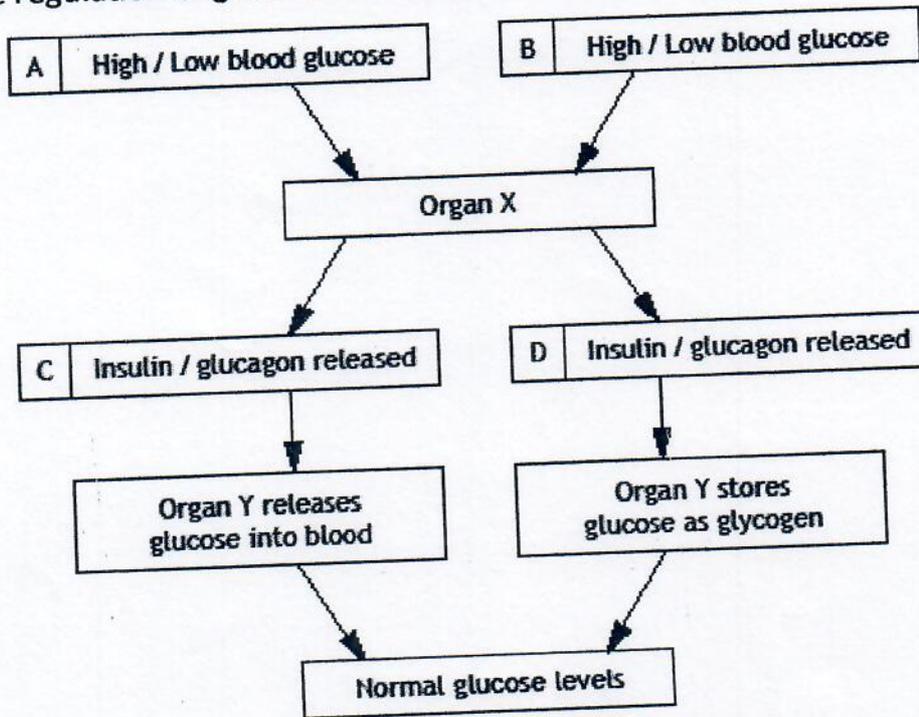
1 Mark



c) What causes the blood glucose to fall?

_____ 2 Marks

d) The regulation of glucose in the blood is represented in the diagram below.



i) Identify organs X and Y

Organ X _____ 1 Mark

Organ Y _____ 1 Mark

ii) Insulin and glucagon are hormones.

Describe two features of hormones.

1. _____ 1 Mark

2. _____ 1 Mark



END

15

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