MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2019

BIOLOGY

2019

P/LAND NATIONAL EXAMINATION BOARD

MINISTRY OF EDUCATION AND HIGHER EDUCATION
PUNTLAND NATIONAL EXAMINATIONS BOARD

Code Number

FORM FOUR EXAMINATION 2019
TIME 2 HOURS AND 10 MINUTES FOR READING

BIOLOGY

Instructions to candidates

- Answer all the questions
- This paper consists of 11 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.
- If you make a mistake, **cross out the incorrect** answer and **write your correct answer.**

This exam paper consists of following parts

Parts	Marks
Part one: Multiple Choice	10 marks
Part two: Structured Questions	90 marks
	Total: 100 Marks

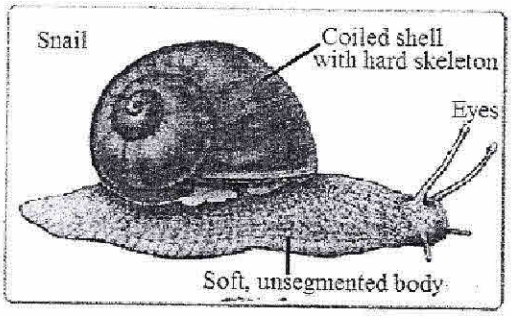
For the markers only

PARTS	MARKS
Part one	
Part two	
TOTAL	%

Use this page for through work, it will not be marked.

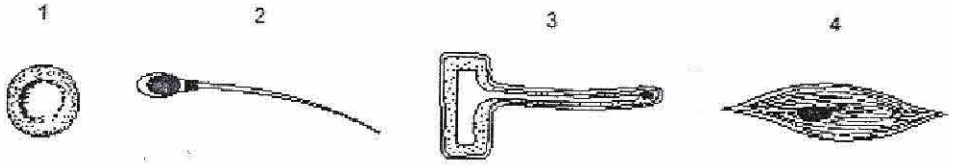
PART ONE: CIRCLE THE CORRECT ANSWER (TOTAL 10 MARKS)

1. Which of the following diseases is caused by bacteria
   A) Sleeping sickness
   B) Malaria
   C) Tuberculosis
   D) Syphilis
2. The process by which water leaves and enter the cell is known as
   A) Diffusion
   B) Mitosis
   C) Osmosis
   D) Metabolism
3. To which one of the following phylum does the organisms in figure below



   A) Annelida
   B) Nemotoda
   C) Platehelminthis
   D) Molluscs

4. The diagram below shows three specialized cells



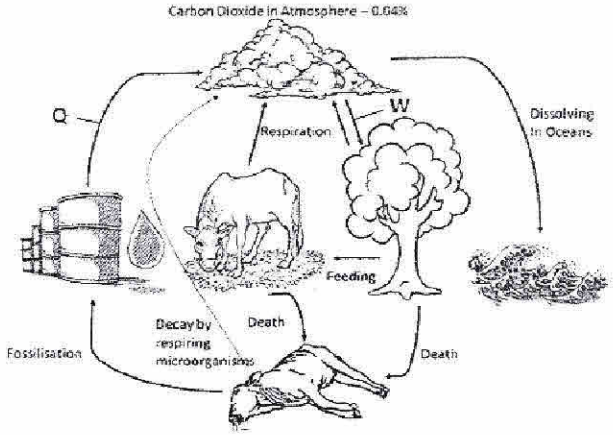
   Which cell can carry oxygen?
   A) Cell 4
   B) Cell 2
   C) Cell 1
   D) Cell 3

5. The chromosomes for the two sexes in human-being are

	Female	Male
A	Yy	Xy
B	Xy	XX
C	XX	Xy
D	XX	yy

6. Carbon dioxide and oxygen in the air are recycled in nature. What are the main processes **W** and **Q** in this recycling?

	W	Q
A	Decay	Photosynthesis
B	Photosynthesis	Combustion
C	Respiration	Decay
D	Photosynthesis	Decay

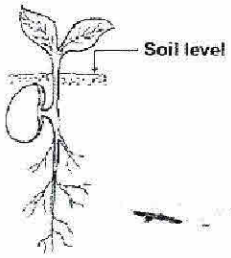


7. The table below shows some minerals and vitamins present in four foods, which food would be best for child who has rickets?

	Calcium	Iron	Vitamin C	Vitamin D
A	Yes	No	Yes	NO
B	Yes	No	No	Yes
C	No	Yes	Yes	No
D	No	Yes	No	Yes

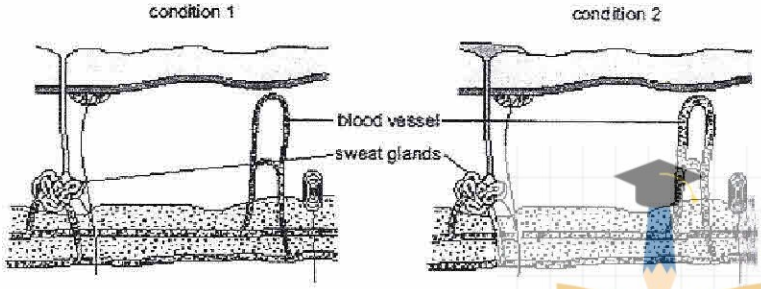
8. In which part of digestive system, most of water is absorbed from food
   A) Stomach
   B) Mouth
   C) Small intestine
   D) Large intestine
9. What type of germination is represented in figure below

   A) Epigeal
   B) Hypogeal
   C) Taproot
   D) Hypocotyls



10. The diagram show structure with in human skin under two external conditions What are external conditions **1** and **2**?

	Condition 1	Condition 2
A	Cool	Hot
B	Cool	Cool
C	Hot	Cool
D	Hot	Hot

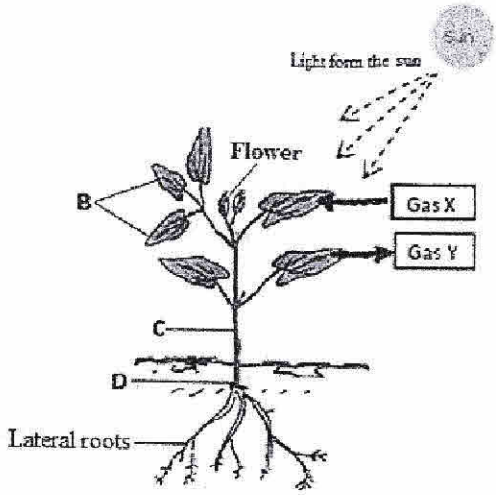


PART TWO: STRUCTURAL QUESTIONS **(TOTAL 90 MARKS)**

ANSWER ALL THE FOLLOWING QUESTIONS

QUESTION ONE: PLANT **(11 MARKS)**

The diagram below shows the structure of plant



a) Name the parts labeled B, C and D.

B_____(1 mark)

C_____(1 mark)

D_____ (1 mark)

b) What gas X and Y represents?

Gas X _____ (1 mark)

Gas Y_____(1 mark)

c) Describe two processes that occur in leaves?

_____ (2 marks)

d) Study the descriptions below and decide which ones belong to **'Photosynthesis' (P)** and which ones belong to **'Respiration'(R).** One example is done for you

(4 marks)

Description	P. or R.
I. uses oxygen	R
II. takes place only in the presence of light	
III. releases energy	
IV. occurs in all cells	
V. uses water	

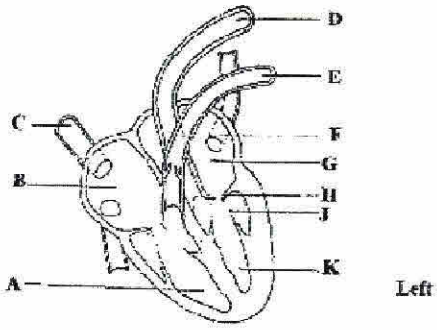
QUESTION TWO: DIVERSITY OF ORGANISM (6 MARKS)

The diagram below shows four different organisms.
Study it and complete the table (6 marks)

	Mammals	Fishes	Amphibians	Reptiles
How it breathes		Gills		Lungs
Where it lives	Mostly in land	In water		
How offspring are produced	Most produce young born alive		Lay eggs in water	

QUESTION THREE: HUMAN PHYSIOLOGY- CIRCULATORY SYSTEM (11MARKS)

The diagram below shows a section through the heart of a mammal.



a) Name the parts labeled **C and D**

C:_____ (1mark)

D:_____(1mark)

b) I) is the blood found at **G** oxygenated or de-oxygenated?

_____(1mark)

ii) Give a reason for your answer in (**b**)

_____

_____ (2 marks)

c) Why is the wall of **K** thicker than the wall of **A**?

_____

_____(2 marks)

d) State two (2) differences in structure or function between an artery and a vein. (4 marks)

ARTERIES	VEINS

QUESTION FOUR: ECOLOGY AND ECOSYSTEM (12 MARKS)

The amount of energy in each trophic level has been provided for the following food chain. The units are $kJ/m^2/yr$

Grass (16000) ⟶ Rabbit (800) ⟶ Fox (40)

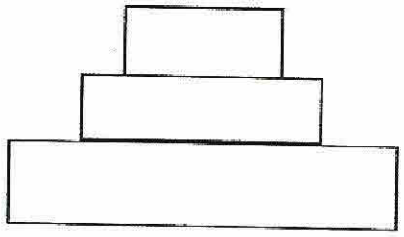
a) In the above food chain, **name**

i) The producer _____ (1 mark)

ii) The primary consumer _____ (1 mark)

iii) The Secondary consumer _____ (1 mark)

b) Label a pyramid of energy for the above food chain? (3 marks)



c) Calculate the percentage of energy entering

i) The grass that passes to the rabbit. (2 marks)

ii) The rabbit that passes to the fox. (2 marks)

d) Explain two ways which energy is lost in the transfer from rabbit to the fox?

_____

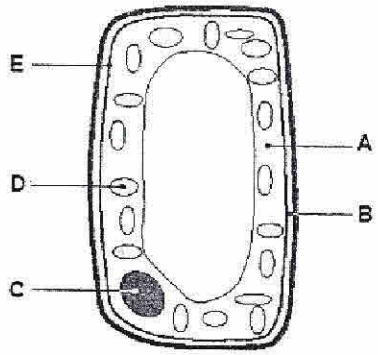
_____

_____ (2 marks)

QUESTION FIVE: THE CELL (6 MARKS)

The diagram shows a plant cell. Look at the diagram.
Use the diagram to help complete the table. (6 marks)

Structure	Label	Function
Cytoplasm		
	E	Controls what enters and leaves the cell
Nucleus		
Chloroplast		Site of photosynthesis



QUESTION SIX: FOOD AND NUTRITION (6 MARKS)

A) The table gives some information about food tests.
Complete the blanks spaces in the table below. (3marks)

Reagent	**Start colour**	**End colour for positive result**
Biuret	Blue	
Benedict's		Brick red (precipitate)
Ethanol	Clear	

B) The table gives information about food molecules.
Complete the blanks spaces in the table below. (3 marks)

Food molecules	**Smaller molecules they are made from**	**Main function in the body**
Carbohydrates	glucose	
Fats		Energy store
	Amino acids	Growth and repair

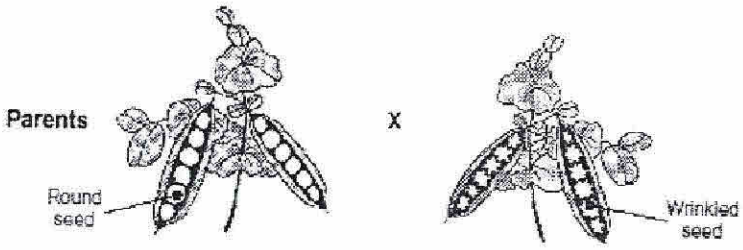
QUESTION SEVEN: GENETICS (11 MARKS)

A) A student carried out a genetic cross between two pure breeding pea plants. The shape of the seed is controlled by two alleles.

a) What is an allele?

_____ (1mark)

b) The diagram below shows the phenotype of parents



The allele for round seed is caused by a dominant allele **R**.
The allele for wrinkled seed is caused by a recessive allele **r**.
Complete the table. (5 marks)

Phenotype	Genotype	Homozygous or Hetrozygous
Roud seed		Homozygous
	Rr	
Wrinkled seed		

c) A student grew plants using two seeds from the offspring. He allowed these plants to fertilize each other.

d) The completed Punnett square show the results of this cross like this

		gametes	
		R	r
gametes	R	**RR**	**rR**
	r	**Rr**	**rr**

i) Write down the **homozygous dominant** genotype in the Punnett square.

_____ (1mark)

ii) Write down the **homozygous recessive** genotype in the Punnett square.

_____ (1mark)

iii) Write down the **heterozygous** genotype in the Punnett square.

_____ (1mark)

e) Explain ***Mendel's first law*** (law of segregation) of genetics?

_____

_____ 2 marks

QUESTION EIGHT: DISEASES **(8 MARKS)**

Some diseases are listed below

A) Malaria
B) Cholera
C) Measles
D) Small pox
E) Influenza
F) Syphilis

Answer the following questions using above diseases:

Which one

a) Is an infectious disease mainly caught by young people?

_____ (1mark)

b) Is deadly disease which is very infectious takes place on the skin?

_____ (1mark)

c) Is insect carrying the germs by sucking blood?

_____ (1mark)

d) Is an outbreak disease which can be controlled by drinking boiled water

_____ (1mark)

e) Is common disease which spread by contaminated air?

_____ (1mark)

f) Is sexual transmitted disease

_____ (1mark)

B) Explain the difference between phagocytes and lymphocytes?

_____

_____

_____

_____ (2 marks)

QUESTION NINE: ENDOCRINE GLAND (9 MARKS)

a) The table below shows the gland, hormone and functions. Complete the blanks in the table (5 marks)

Gland	Hormone	Function
Pituitary		Stimulates estrogen section in ovaries
	Thymosin	Regulates the development and function of immune system
Pancreas	Insulin	
Adrenal		plays an important role in the fight-or-flight response by increasing blood flow to muscles

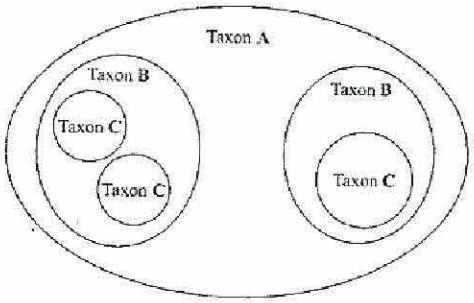
b) What are two **main** functions of endocrine gland in human body?

_____

_____ (4 marks)

QUESTION TEN: CLASSIFICATION (4 MARKS)

In taxonomy, each of the level of classification (class, family, genus, kingdom, order, phylum and species) is called a taxon. The diagram represents just three of these levels of classification.



a) Explain which of these levels of classification could **NOT** be
   i) a genus;_____ (1 mark)
   ii) a phylum;_____ (1 mark)

b) Complete the list to show the different taxonomic groups into which a kingdom can be divided. Write your list in the correct order. (2 marks)

1. Kingdom
2. _____
3. _____
4. Order
5. _____
6. _____
7. Species

QUESTION ELEVEN: BIOTECHNOLOGY (6 MARKS)

a) Differentiate the following terms

i) Biotechnology and fermentation

_____

_____

_____ (2 marks)

ii) DNA and RNA

_____

_____

_____ (2 marks)

b) Explain the term "***cloning'*** in animals?

_____

_____ (2 marks)

END.