

**MINISTRY OF EDUCATION AND HIGHER EDUCATION**

**FORM FOUR EXAMS, 2016**

# **BIOLOGY**



**P/LAND NATIONAL EXAMINATION BOARD**

MINISTRY OF EDUCATION AND HIGHER EDUCATION  
PUNTLAND NATIONAL EXAMINATIONS BOARD

Code Number

FORM FOUR EXAMINATION 2016  
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

PART ONE: Multiple choice

10 marks

PART TWO: Structural Questions

90 marks

TOTAL 100 marks

For the marker only

Parts	Marks
Part one	
Part two	
Total	%



SOM EXAMS

**PART ONE: MULTIPLE CHOICE QUESTIONS**

**TOTAL 10 MARKS**

Circle the correct answer

1. The diagram below shows a boy suffering a deficiency disease

- A) Rickets
- B) Scurvy
- C) Kwashiorkor
- D) Iron



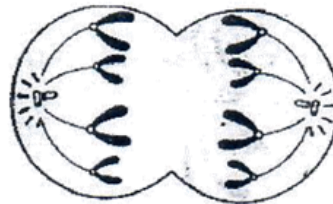
2. Fadumo is going to test protein from food, but she forget the chemical to test so which one of the following chemical you choice her to continue her experiment.

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

3. The diagram shows a stage of mitosis in an animal cell

Which stage is in the above diagram?

- A) Metaphase
- B) Anaphase
- C) Tale phase
- D) Paraphrase



4. The diagram below shows type of invertebrate.

- A) Annelids
- B) Nematode
- C) Arthropod
- D) Flat worm



5. Where does digestion begin?

- A) Throat
- B) Mouth
- C) Stomach
- D) Small intestine

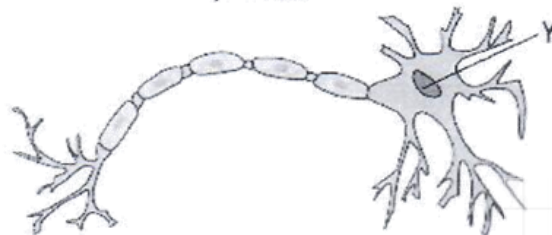
6. In DNA, Guanine always pairs with

- A) Adenine
- B) Cytosine
- C) Thymine
- D) Uracil

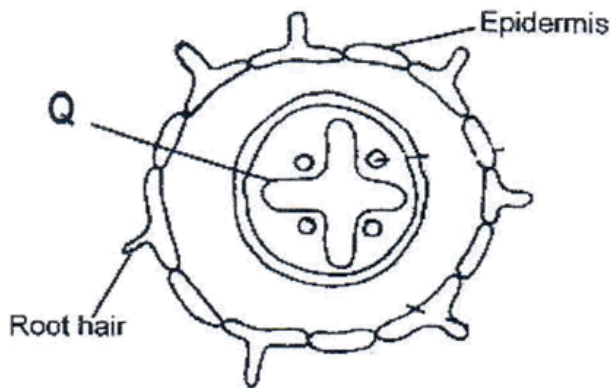
7. The diagram shows a neuron

What is the part labeled Y called

- A) Myelin sheet
- B) Dendrite
- C) Nucleus
- D) Axon



8. The figure below shows transverse section of a certain organ obtained from a certain plant



Part Q represents

- A) Phloem
- B) Epidermis
- C) Xylem
- D) Root hair

9. Which of the following hormones takes part the increase of metabolic reaction in the body

- A) Adrenaline
- B) Thyroxin
- C) Glycogen
- D) Insulin

10. The children of a colour-blind mother and a normal father will be

- A) Normal daughters and sons
- B) Normal sons and carrier daughters
- C) Colour blind sons and carrier daughters
- D) Colour blind sons and daughter

**PART TWO: STRUCTURAL QUESTIONS**

**90 MARKS**

Answer all the following questions in space provided

**QUESTION ONE**

**(10 MARKS)**

Match these organisms in A, B, C, and D with their gas exchange surfaces in 1-5 in the table.

Organism	Gas exchange surface	write a letter
A- Frog	1- Cell membrane	
B- Amoeba	2- Stomata	
C- Fish	3- Lungs	
D- Human	4- Gills	
E- Plant	5- Skin	



**QUESTION TWO****(4 MARKS)**

This table shows the energy content (in kJ per 100g) of some common foods

The columns A, B, C, and D are the percentage of protein, fat, carbohydrates, or water in each food.

Food	Energy (KJ/100g)	A (%)	B (%)	C (%)	D (%)
Milk	290	3	89	4.5	3.5
Butter	3000	0.5	16.5	-	83
Potatoes	370	2	82	16	-
Beef	1300	25	55	-	20
Tuna	700	18	70	-	12

a) Which has highest energy content?

\_\_\_\_\_ (1 Mark)

b) Which has lowest energy content?

\_\_\_\_\_ (1 Mark)

c) Which food can produce a quick source of energy?

\_\_\_\_\_ (1 Mark)

d) Which food is for deficiency of iodine?

\_\_\_\_\_ (1 Mark)

**QUESTION THREE****(8 MARKS)**

Match the elements in column A with their functions in column B.

Column A	Write missing letters	Column B
1- Nitrogen		A- Formation of hemoglobin
2- Phosphorus		B- Nerve impulse transmission and contraction of muscles
3- Iron		C- Formation of protein and nucleic acids
4- Chlorine and sodium		D- Protein synthesis bone and teeth formation and ATP formation

**QUESTION FOUR**

**(10 MARKS)**

Some microbes are pathogenic to human and cause disease like following:

**Cholera, typhoid, syphilis, measles, AIDs, malaria and sleeping sickness**

- a) List down the bacterial diseases given above

\_\_\_\_\_ (3 Marks)

- b) Explain how cholera can be transmitted from one person to another?

\_\_\_\_\_ (2 Marks)

- c) Describe briefly two ways of controlling malaria in the Puntland Environment?

\_\_\_\_\_ (3 Marks)

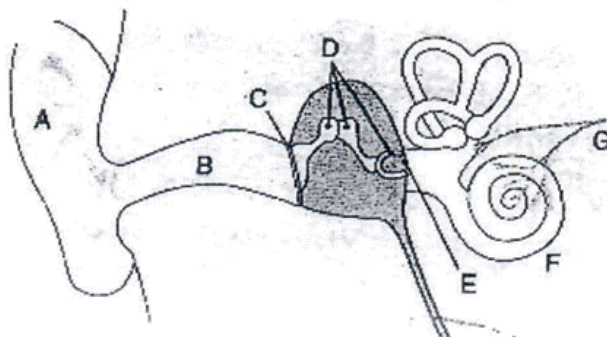
- d) Choose two diseases which virus can cause?

\_\_\_\_\_ (2 Marks)

**QUESTION FIVE**

**(5 MARKS)**

The diagram shows the structure of the human ear.



- a) Name the part labeled A and D

\_\_\_\_\_ (1 Mark)

b) What are functions of the part labeled

i) G \_\_\_\_\_  
\_\_\_\_\_ (1 Mark)

ii) F \_\_\_\_\_  
\_\_\_\_\_ (1 Mark)

iii) D \_\_\_\_\_  
\_\_\_\_\_ (1 Mark)

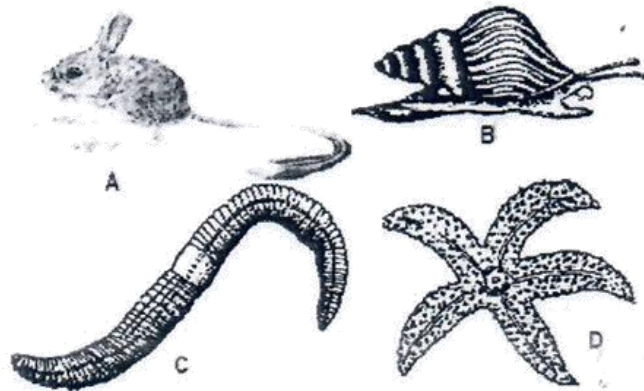
c) Apart from hearing, what is other function of ears?

\_\_\_\_\_  
\_\_\_\_\_ (1 Mark)

QUESTION SIX

(6 MARKS)

The diagram below represents three examples of invertebrates and one vertebrate



A) Name the phylum to which B, C and D belongs?

\_\_\_\_\_  
\_\_\_\_\_ (3 Marks)

B) Identify the only one vertebrate in the above organisms?

\_\_\_\_\_  
\_\_\_\_\_ (1 Mark)



C) Describe the meaning of taxonomy?

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(2 Marks)

**QUESTION SEVEN**

**(16 MARKS)**

In a family with 4 children, three were found to have normal skin pigmentation while one was an albino. Using letter "A" to represent the gene for normal skin pigmentation and "a" to represent the gene for albinism.

a) What are genotypes of the parents?

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(1 Mark)

b) Work out the genotype of

i) Normal pigmentation children

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(2 Marks)

ii) The albino child

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(2 Marks)

c) What are the probabilities that the fifth child will be an albino?

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(2 Marks)

d) Differentiate the following terms:

i) Homozygous and heterozygous

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(2 Marks)





ii) Recessive and dominant

\_\_\_\_\_ (2 Marks)

\_\_\_\_\_

e) What is genetic engineering?

\_\_\_\_\_ (1 Mark)

\_\_\_\_\_

**QUESTION EIGHT**

**(8 MARKS)**

Non-living things such as car often show characteristics similar to those of living organisms.

Match characteristics of living things in A-D with the description linked to a car in 1-4 in the table

Car's description	Characteristics of living things	Missing Letter
A- Burning fuel in the engine to release energy	1- Excretion	
B- Filling the cars tank with fuel	2- Respond or sensitivity	
C- Release of waste gases	3- Feed or nutrition	
D- Headlights that switch on automatically in the dark	4- Respiration	

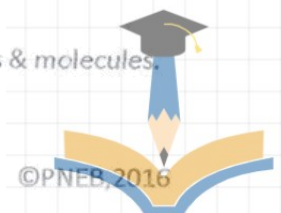
**QUESTION NINE**

**(5 MARKS)**

Complete the sentences below using the following words in the list

**Golgi apparatus    Endoplasmic reticulum    Lysosomes    Vacuole    Cytoplasm**

- \_\_\_\_\_ Jelly-like material found in the cell. Contains organelles & where most cell processes take place.
- \_\_\_\_\_ Acts as cell's cleanup crew by digesting worn out organelles & molecules.

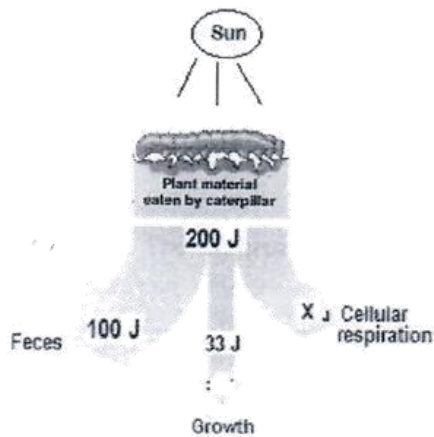


3. \_\_\_\_\_ Stores water, salt, & other molecules. Oversized in plants to enable them to support flowers & leaves.
4. \_\_\_\_\_ Acts like transportation system by modifying & exporting materials and has 2 forms, smooth & rough.
5. \_\_\_\_\_ Modifies, sorts, and packages cellular materials.

**QUESTION TEN**

**(7 MARKS)**

The diagram below shows the flow of energy through a food chain.



- a) Identify the process that occurs when energy is absorbed by the producers?

\_\_\_\_\_  
 \_\_\_\_\_ (2 Marks)

- b) Work out energy released to X?

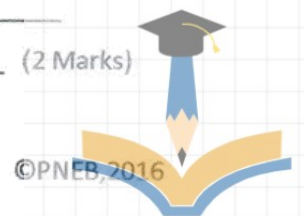
\_\_\_\_\_  
 \_\_\_\_\_ (2 Marks)

- c) Name the only consumer in this food chain?

\_\_\_\_\_  
 \_\_\_\_\_ (1 Mark)

- d) Write a word equation for the respiration process?

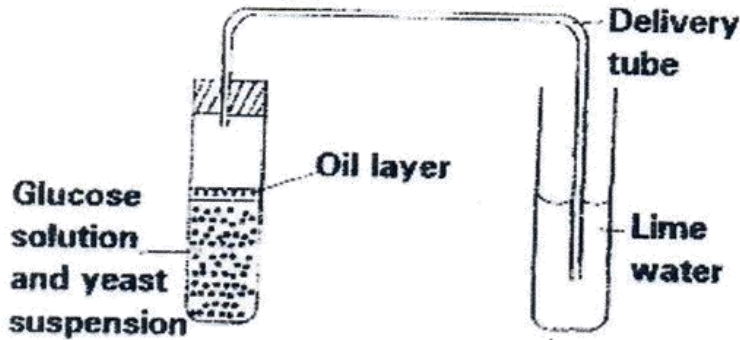
\_\_\_\_\_  
 \_\_\_\_\_ (2 Marks)



QUESTION ELEVEN

(3 MARKS)

The diagram below shows a set up that was used to demonstrate fermentation.



Glucose solution was boiled and oil added on top of it. The glucose solution was then allowed to cool before adding the yeast suspension.

a) Why was the glucose solution boiled before adding the yeast suspension?

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(1 Mark)

b) What was the importance of cooling the glucose before adding the yeast suspension?

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(1 Mark)

c) What was the use of the oil in the experiment?

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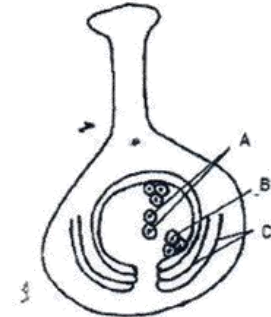
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(1 Mark)

**QUESTION TWELVE**

**(7 MARKS)**

The figure below represents a female part of the flower



a) Name the part labeled A.

\_\_\_\_\_ (1 Mark)

b) A flower was found to have inconspicuous petals, long feathery stigma and small light pollen grains.

i) What is the likely agent of pollination of the flower?

\_\_\_\_\_ (1 Mark)

ii) What is the significance of small light pollen grains?

\_\_\_\_\_ (1 Mark)

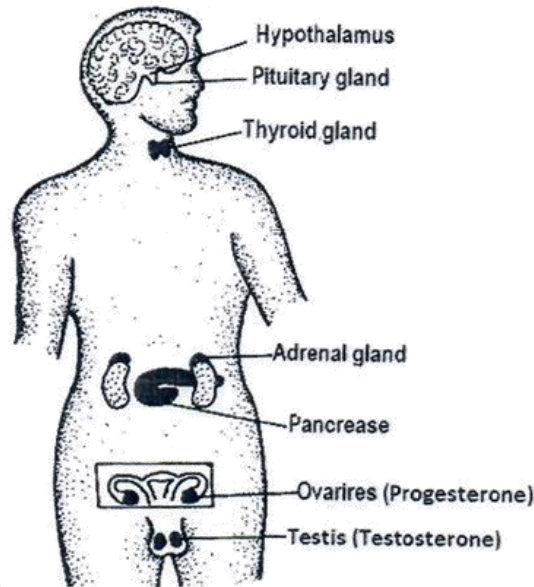
c) State two differences between the following (4 Marks)

Xylem	Phloem

**QUESTION THIRTEEN**

**(6 MARKS)**

The diagram below shows endocrine system



a) Which hormone

i) Prepares the body for action

\_\_\_\_\_ (1 Mark)

ii) Increase the amount of glucose in the body

\_\_\_\_\_ (1 Mark)

b) Write down three gland those can be compound gland

\_\_\_\_\_  
\_\_\_\_\_ (3 Marks)

c) Which gland can be both endocrine and exocrine gland

\_\_\_\_\_  
\_\_\_\_\_ (1 Mark)

End.