

MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2013

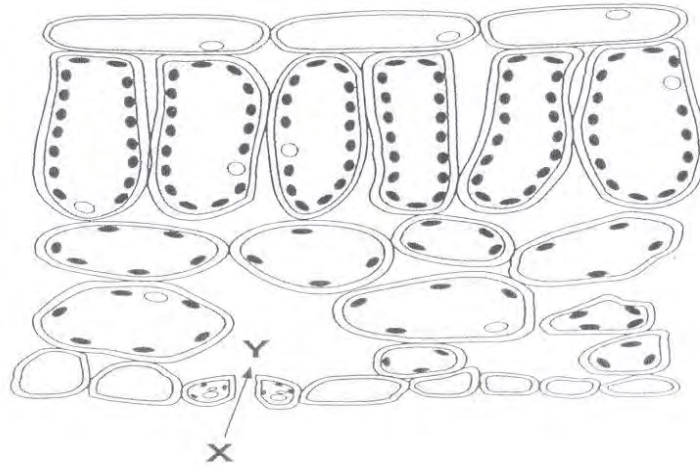
BIOLOGY



P/LAND NATIONAL EXAMINATION BOARD

SECTION A: MULTIPLE CHOOSE QUESTION TOTAL 10 MARKS

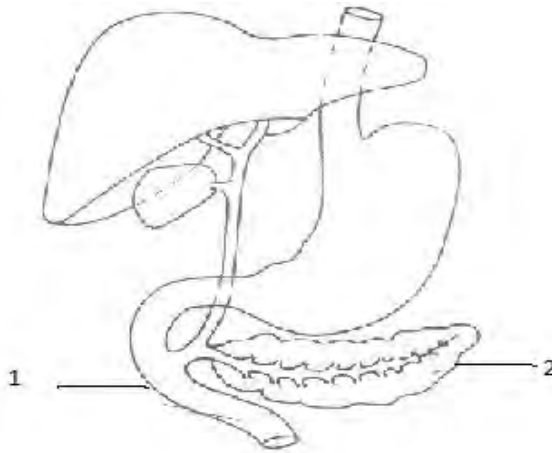
1. The diagram shows a section through a leaf.



- By which process does carbon dioxide pass from X to Y?
- A) Osmosis
B) Diffusion
C) Translocation
D) Transpiration
2. Which one of the following is correct order of organization from simple to complex?
- A) Cell, organ, tissue
B) Tissue, cell, organ
C) Cell, tissue, organ
D) Organ, cell, tissue
3. Sweating cools the body because
- A) Sweat is cooler than the blood
B) Evaporation of sweat requires heat
C) Heat is needed to form sweat
D) Sweat glands dilute to release sweat
4. If an onion cell having a diploid chromosome number of 16 is divided by mitotic cell division, the resulting daughter cells will each have
- A) 8 chromosomes
B) 16 chromosomes
C) 4 chromosomes
D) 32 chromosomes



5. The diagram shows part of the digestive system



What is function of liquid produced by part 1 and releases into part 2?

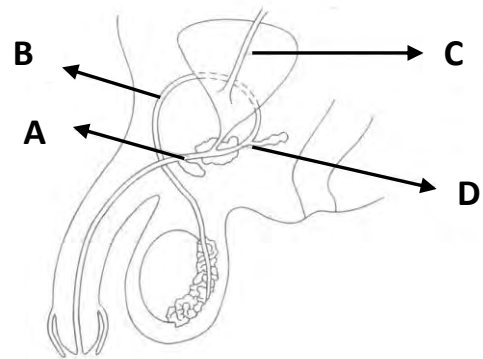
- A) To digest protein to amino acids.
 - B) To increase the surface area of fat droplets
 - C) To acidify the content of part 2
 - D) To prevent further digestion of starch
6. Which of the following senses are detected by the same
- A) Taste and smell
 - B) Sight and hearing
 - C) Hearing and touch
 - D) Hearing and balance
7. Which of the following substance is NOT found in blood plasma?
- A) Carbon dioxide
 - B) Glucose
 - C) Insulin
 - D) Hemoglobin
8. The base which occur in RNA is
- A) Adenine
 - B) Guanine
 - C) Uracil
 - D) Thymine



9. The diagram below shows reproductive organs of human male

Which tube carries both sperms and urine?

- A) A
- B) B
- C) C
- D) D



10. The kind of immunity that is gained as result of vaccination with weakened pathogens such as measles are called

- A) Passive immunity
- B) Inborn immunity
- C) Active immunity
- D) Natural immunity

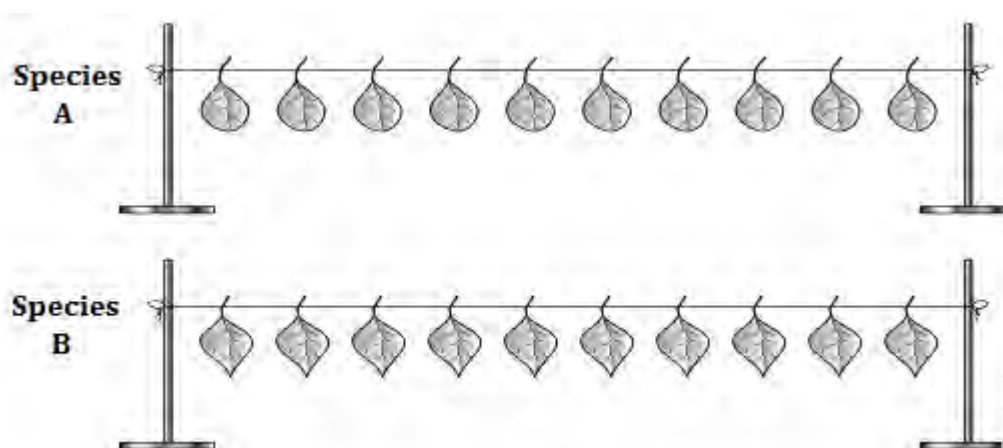
SECTION B: STRUCTURE QUESTIONS

Answer all the following questions in space provided.

QUESTION ONE

Plants lose water from the surface of their leaves.

A student from Sheikh Osman secondary did an experiment to compare the loss of water from leaves of three different species of plant, A, B and C. He weighed 10 leaves of similar size of each species and hung them on a wire for three hours. Then he weighed the leaves again.



a) What name is given to the loss of water from the surface of a leaf?

..... (1 Mark)

The table shows the student's results

Species	Mass of 10 leaves in g	
	At start	At after three hours
A	2.25	2.23
B	2.37	2.36
C	2.51	2.51

i) Which species appeared to lose most water? Give a reason for your answer.

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

ii) Which species is not changed after three hours?

..... (1 Mark)

QUESTION TWO

The figure below illustrates a light microscope.

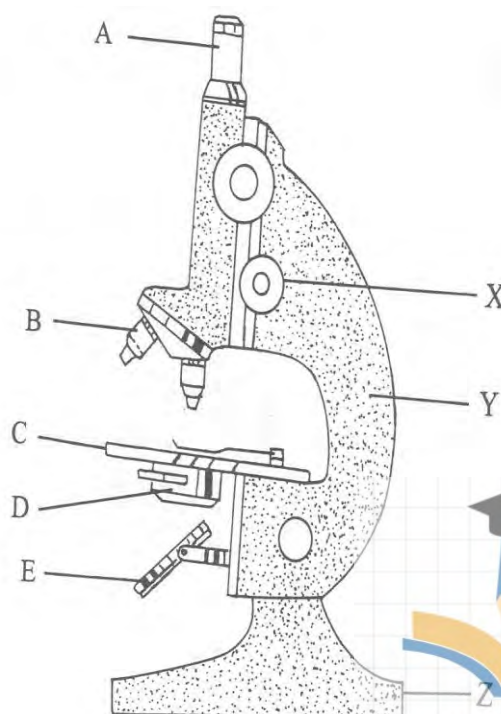
a) Name label the parts A, B, and Y.

A.

B.

Y.

(3marks)



b) A student was observing a specimen using the higher power objective but image was not clear which part of the microscope can he use to get a sharp image?

.....(1 mark)

c) Which part of a microscope should be held when it is being moved from one place to another?

..... (1 Marks)

QUESTION THREE

Some health disorders are listed below.

Each two marks (10 marks)

Match these disorders A, B, C, D and E with their causes 1-5 in the table below.

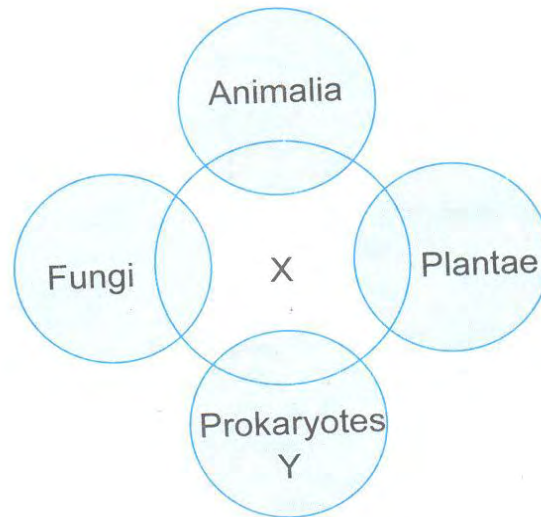
A. Scurvy B. Obesity C. Anemia D. Night blindness E. Beriberi

Disorder	Cause
1.....	Deficiency of vitamin A
2.....	Deficiency of vitamin B ₁ (Thiamine)
3.....	Deficiency of vitamin C
4.....	Deficiency of iron
5.....	Excess of carbohydrates and fats



QUESTION FOUR

Fadumo drew the diagram below to summarize the five kingdoms into which organisms are divided. Study the diagram and answer the questions that follow.



a) Which kingdoms are represented by X and Y.

X. (1 mark)

Y. (1 mark)

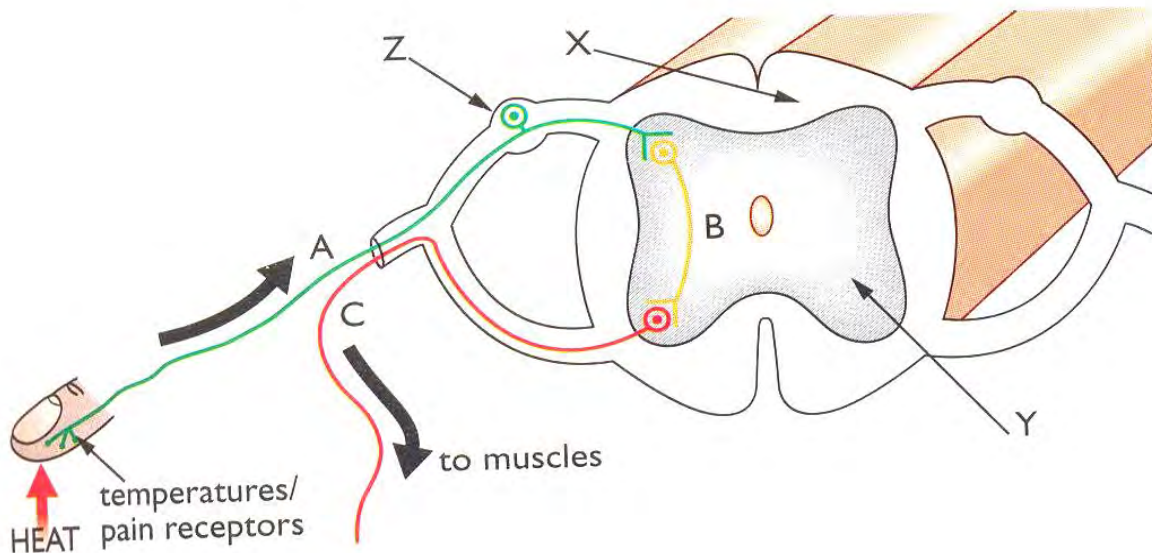
b) Why is fungi recognized as a separate kingdom from plantae?

..... (2 marks)



QUESTION FIVE

The diagram shows some parts of the nervous system involved in a simple reflex action that when a finger touches a hot object.



- a) What type of neurons is
- i. neurone A (1 Mark)
 - ii. neurone B (1 Mark)
 - iii. neurone C (1 Mark)

b) State the function of neuron A and C. (2 Marks)

.....

.....

.....

.....



- c) Explain the process involved when a person withdraws a hand from hot object? (3 Marks)

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

QUESTION SIX

In a study to establish the population of frogs in school pond, students from Omar Samatar School captured frogs at random from the well then marked them and released them into the pond. The total number of frogs marked was 720. Several days later, the students revisited the same well and captured 540 frogs out of which 450 were marked.

- a) Suggest how the students captured the frog
.....
.....(1 mark)

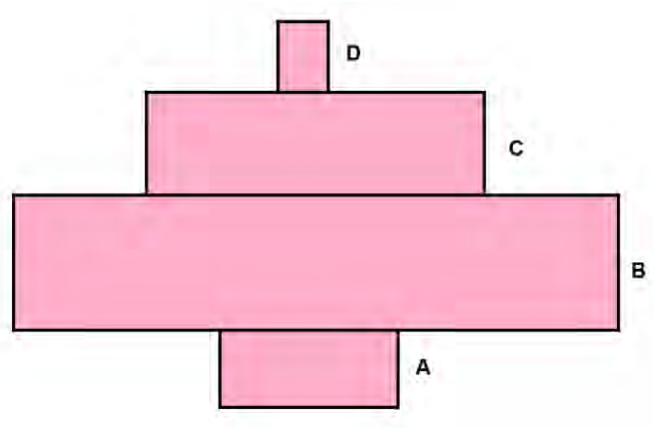
- b) What did the students use to mark the frog
.....
.....(1 mark)

- c) Calculate the population of frogs that were in the pond. Show your work.

Ans (2 marks)



d) The diagram below shows an inverted pyramid of numbers of organisms A, B, C, and D.



Identify the organism with the

i. Highest population(1 mark)

ii. Highest biomass (1 mark)

iii. State two main trophic levels in an ecosystem.

.....
.....
..... (2 marks)

iv. Draw a food chain using the above pyramid?

..... (1 mark)

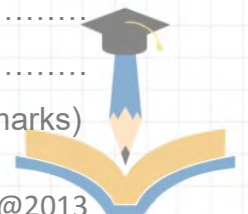
e) Define

i) Pyramid number

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

ii) Pyramid biomass

.....
.....
..... (2 marks)



QUESTION SEVEN

In an experiment, a leaf from a plant which had been kept in the dark overnight and then was boiled in water for a minute, boiled in alcohol and washed in water. Iodine solution was then added on to the leaf.

a) Why was the leaf boiled in:

- i. Water? (1 mark)
- ii. Alcohol? (1 mark)

b) What observation was made after adding iodine to the leaf? (1 Marks)

.....
.....

c) Give a reason for your observation.

..... (1 Mark)

d) State the aim of the experiment.

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

QUESTION EIGHT

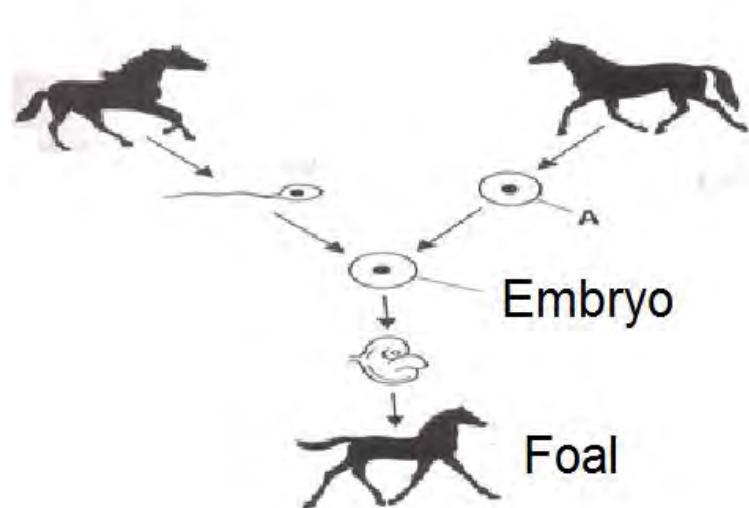
a) Complete the following sentences using the words from list. (4 marks).

Alleles	Chromosomes	genes	mutation
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The nucleus of cell contains thread-like structure called..... The characteristics of a person are controlled by..... which may exist in different forms called..... but when sudden change in genetic constitution happens is called.....



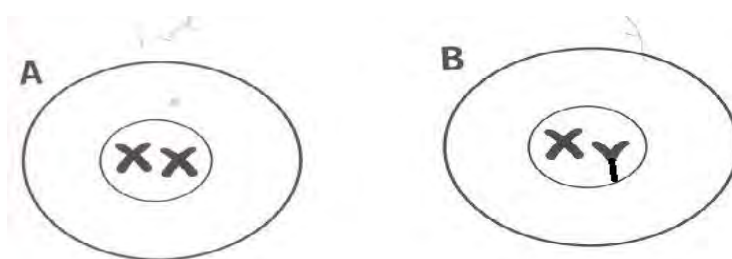
b) The drawing shows some of the stages of reproduction in horses.



i. Name this type of reproduction.
..... (1Mark)

ii. Name the type of cell labeled A.
..... (1 Mark)

c) The diagram below shows the sex chromosomes of two cells A and B.



i. Which of these cells come from a male and which from a female?
A (1mark)
B (1 Mark)

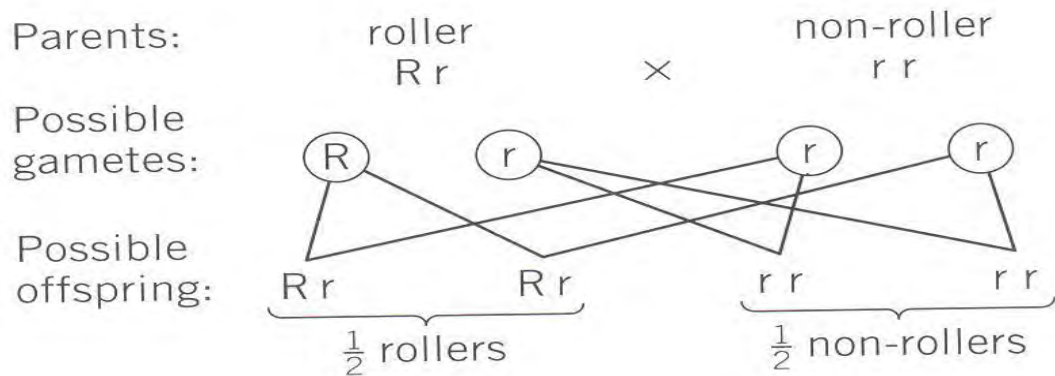
ii. Which part of a cell contains genetic material?
..... (1 Mark)



iii. Name the molecule that genetic material is made from.

.....(1 Mark)

d) The figure below shows a cross between a heterozygous tongue rolled and a non-rolled. The alleles for tongue rolling is dominant over the alleles for non-rolling.



i. How many children are tongue rollers?

..... (1 Mark)

ii. Write down the percentage of non-roller offspring.

..... (1 Mark)

iii) What is phenotype of the parents?

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



QUESTION NINE

The names of some diseases are listed below. Each one mark (6 marks)

- A. Malaria B. Aids D. Common cold
- E. Ringworm F. Typhoid G. Tetanus

a) Answer these questions using letters A-G.

- i. Which disease can be controlled to avoid using other people's comb.
.....
- ii. Which disease can be transmitted through inhalation of cough droplets from an infected person.
- iii. Which disease can be caused by salmonella typhi
- iv. State disease can be protected for vaccination.
- v. Name the disease which can be transmitted during birth from mother to her child.
- vi. Which disease is vector-born disease.

b) State two physical ways that malaria can be controlled in punt land.

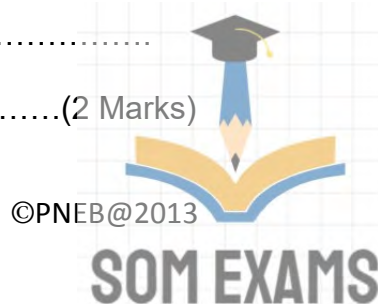
.....
..... (2 Marks)

c) Define

i. Phagocytosis
..... (2 Marks)

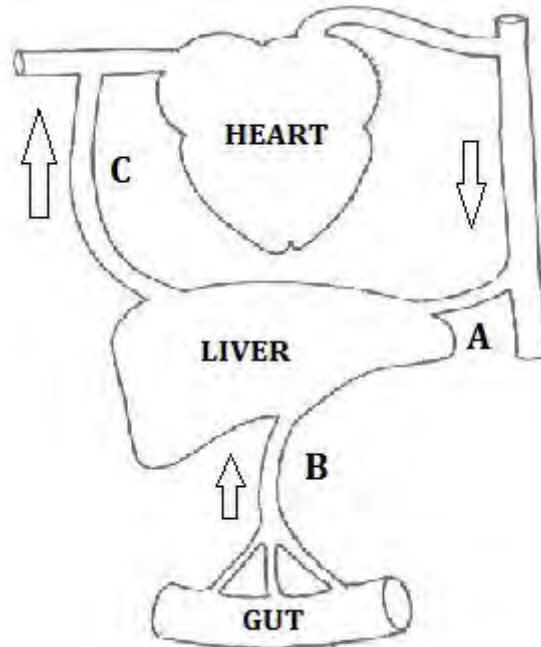
ii. Antigen
..... (2 Marks)

iii. Enzyme
..... (2 Marks)



QUESTION TEN

Study the diagram below and answer the questions that follow.



a) Name the blood vessels labeled A and C.

A (1 mark)

C (1 mark)

b) Explain why the level of blood sugar in vessel C would be higher than that in vessel B during fasting.

.....

..... (2 marks)

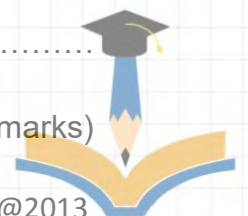
c) State the vessel that has the highest concentration of urea among the vessel labeled A, B, and C.

..... (1 mark)

d) How vessel B structurally adapted to perform its function?

.....

..... (2 marks)



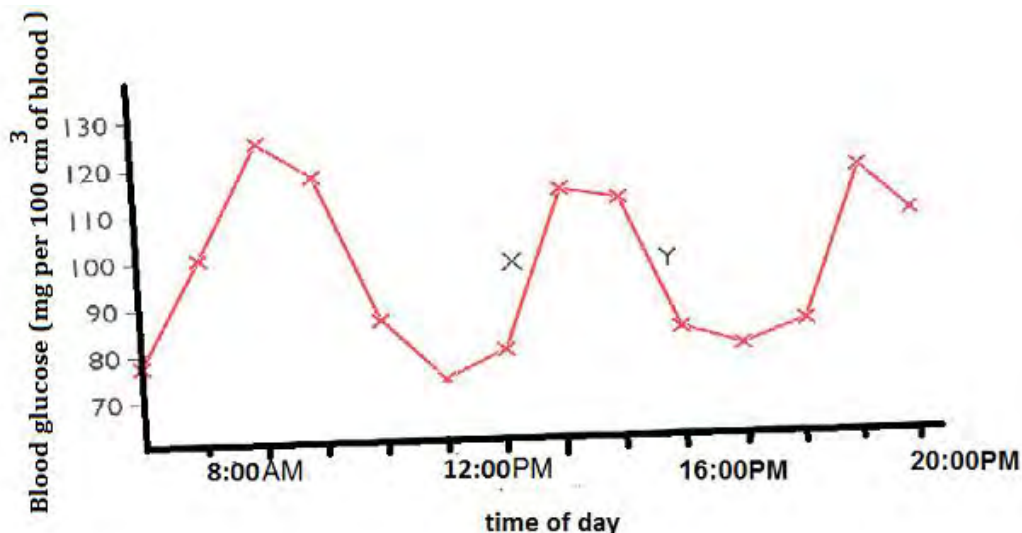
QUESTION ELEVEN

The table below shows three mammalian hormones.

a) Complete the empty space filling suitable words or sentences. (5 marks)

Hormone	Site of production	Function
Adrenaline	Increase heart rate, and blood circulation
.....	Testis
.....	pancreas	Controls rise and decline of blood level
Thyroxin	Stimulates metabolism and growth

b) The graph below shows the changes in blood glucose in healthy woman over a 12-hour period. (Hint: Time starts from 7:00 am-8:00pm)



i) Explain why there was a rise in blood glucose at X.
..... (2 Marks)

ii) What would be blood glucose of the woman when the time is 8:00 am?
.....(1 Mark)

iii) State the two symptoms of diabetes.
.....
..... (2 Marks)

END



Dotted lines for writing answers.

