Candidate's Name:……signature……

553/1

BIOLOGY

Paper 1

2024

B.PETER'S ACADEMIC PLATFORM

UGANDA LOWER SECONDARY CERTIFICATE OF EDUCATION

ASSESSEMENTS TO CANDIDATES

SOLUTIONS TO BIOLOGY ITEMS

THEORY

SENIOR FOUR

Item 1

a)

BIOLOGICAL HIERARCHIES	POLITICAL ADINISTRATION
Kingdom	**World**
Phylum(phyla)	**Continent**
Class	**Country**
order	**District**
family	**Country**
Genus(genera)	**Sub-county**
species	**parish**

b) <u>Biological hierarchy of man</u>

Kingdom	Animalia
Phylum(phyla)	Chordate
Class	Mammalia
order	Primates
family	Hominidae
Genus(genera)	Homo
species	sapiens

c) <u>Importance of classification</u>

- It is easy to study organisms in the same group since the members of a specific group resemble
- It helps the scientists to easily identify organisms belonging to the same group

Item 2

a) The Oestral cycle is a series of physiological changes that occur in a woman's body every month. It is a natural process that prepares the body for a potential pregnancy. The cycle is divided into three phases i.e. menstruation, follicular phase, and luteal phase.

During **menstruation**, the uterine lining is shed, and the body prepares for the new cycle. In the **follicular phase**, the body starts to produce a follicle, which is a small sac that contains an egg. This follicle releases estrogen, which causes the uterine lining to thicken in preparation for a fertilized egg. If the egg is not fertilized, the follicle ruptures, and body releases progesterone, which causes the uterine lining to be shed, result in **menstruation.**

If the egg is fertilized, it is implanted in the uterine lining, and the body stars to produce **progesterone**, which helps to maintain the uterine lining and supports the

development of the **fetus.** If the egg is not fertilized, the body stops producing progesterone, and the uterine is shed, resulting in menstruation.

b) The Oestral cycle involves several hormones, including Estrogen, Progesterone, and Follicle-stimulating hormone (FSH).

   Estrogen is produced by the ovaries and is responsible for causing the uterine lining to thicken in preparation for a fertilized egg.

   Progesterone is also produced by the ovaries and helps to maintain the uterine lining and supports the development of the fetus if the egg is fertilized.

   FSH is produced by the pituitary gland and stimulates the growth of the follicle in the ovary

Understanding the Oestral cycle and the hormones involved can help Rachael and John better understand their bodies and how to plan for a pregnancy. It can also help them identify any potential issues that may be affecting their ability to conceive

Item 3

a) Dependent variable: resistance to drought of the tree spices
   Independent variables: number of tree spices

b) To describe the shape of the graph, one could observe the trend of the data points. If the graph shows an increasing trend, it could be described as a positive correlation between the number of the tree species and the resistance to drought.

   Conversely, if the graph shows a decreasing trend, it could be described as a negative correlation between the number of tree species and the resistance to drought

Item 4

Sex linkage refers to the inheritance of genes that determine certain physical characteristics such as eyes color, or blood type. These genes are located on the sex chromosomes, which are either X or Y chromosomes.

In humans, female have two X chromosomes (XX), while males have one X and one Y chromosome(XY). This means that genes located on the X chromosome are more likely to be

inherited by both sons and daughters, while genes located on the Y chromosome are likely to be inherited only by sons.

For example, if a mother carries a gene for blue eyes on her X chromosome, all of her daughters will inherit that gene and have blue eyes. However, if the father also carries the gene for blue eyes on his Y chromosome, all of his sons will inherit that gene and also have blue eyes.

Item 5

The high concentration of factories in Kampala Metropolitan Area might be affecting the gaseous exchange of all organisms present in the Kawempe region in several ways:

1. Increased air pollution: The presence of numerous factories in the area could lead to higher levels of air pollution, including the release of harmful gases and particulate matter. This pollution can negatively impact the respiratory systems of both humans and other organisms, making it more challenging for them to exchange gases efficiently.

2. Changes in air composition: The factories might be releasing specific gases or altering the composition of the air in the region. This could disrupt the normal balance of gases in the atmosphere, affecting the ability of organisms to extract oxygen and release carbon dioxide during respiration.

3. Disruption of natural air circulation patterns: The presence of factories could disrupt the natural air circulation patterns in the Kawempe region, leading to pockets of stagnant air or changes in wind direction. This could hinder the exchange of gases between organisms and the atmosphere, affecting their ability to respire effectively.

4. Release of allergens and irritants: Factories often release allergens, irritants, or other substances that can exacerbate respiratory disorders in both humans and other organisms. This could lead to increased symptoms and make it more challenging for organisms to carry out normal gaseous exchange processes.

In conclusion, the high concentration of factories in Kampala Metropolitan Area could be affecting the gaseous exchange of all organisms present in the Kawempe region by introducing pollutants, altering air composition, disrupting natural air circulation patterns, and releasing allergens and irritants. These factors could contribute to the increased prevalence of respiratory disorders in the area.

Item 6

A cross match table

Recipient

Donor

	A	B	AB	O
A		X		X
B	X			X
AB	X	X		X
O				

Key

X --------- Incompatible

---------compatible

Note:

- ✓ Blood group AB can receive blood from all other blood group because it has no antibodies and its is therefore called a universal recipient
- ✓ Blood group O can donate blood to all other blood groups because it has no antigens and therefore its called a universal donor