

UMSSN A LEVEL INTERACTIVE BIOLOGY SEMINAR 2019
DISCUSSION QUESTIONS

1. (a) Describe the;
(i) role of the pancreas in the digestion of food and metabolism of the absorbed products.
(ii) control of digestive juice secretion along the alimentary canal in humans.
(b) The table below summarises the mechanisms of control of release of digestive secretions along different parts of the human alimentary canal.

Part of Alimentary canal	Control mechanism
Mouth	Nervous only
Stomach	Both nervous and hormonal control
Duodenum	Hormonal control only

(i) Discuss the significance of the trend of control of release of digestive secretions shown in the table.

(ii) Give reasons why release of digestive secretions should be controlled.

UGANDA MARTYRS' S.S. NAMUGONGO

2. (a) Describe the structure of a plant cell wall.
(b) State the functions of the cell wall in plants.
(c) State the differences between the cell wall and the plasma membrane.
(d) Describe how the cell wall is strengthened in various forms of life.

LUWEERO S.S.

3. Discuss the significance of the chemical composition, arrangement and distribution of mammalian photoreceptors in the eye.

HILTON HIGH SCHOOL

4. (a) Differentiate between growth and development.
(b) Explain how each of the following takes place.
(i) Increase in girth of a flowering plant stem. (ii) Increase in size of a mammal after birth.
(c) How is old cuticle in insects replaced by new cuticle?
(d) What is the significance of larva forms in the life cycle of some organisms?

RINES INTERNATIONAL S.S.

5. (a) What are the principle effects of each of the following plant hormones on plant tissue?
(i) auxin (ii) gibberellin (iii) cytokinin (iv) abscisic acid
(b) Explain how the balance between two or more of the hormones listed in (a) above controls
(i) seed dormancy and germination (ii) leaf senescence and abscission

KIIRA COLLEGE BUTIKI

6. (a) Describe the structure of each of the following tissues, indicating in each case how structure is related to function.

- (i) Parenchyma (ii) Collenchyma (iii) Sclerenchyma

(b) Compare the distribution of tissues in a dicotyledonous stem and root in relation to the mechanical functions of the stem and root.

ST. MARK'S COLLEGE NAMAGOMA

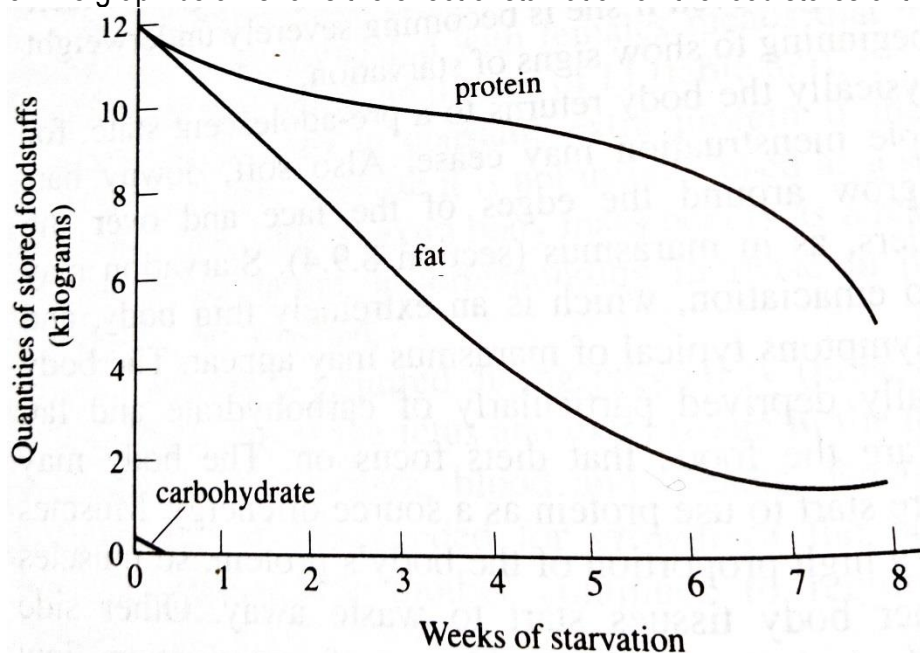
7. (a) Explain why an Amoeba does not need a specialized surface for gaseous exchange.
(b) Describe the roles of membranes in an Amoeba.
(c) Most of the organelles of eukaryotic cells are bound by membrane. State the significance of this observation.
(d) Explain what would happen to an Amoeba if it had no contractile vacuole.
(e) A student investigated the activity of the contractile vacuole when an Amoeba was placed in solutions of different water potential. The student placed the Amoeba in each solution and counted the number of times the contractile vacuole filled and emptied in the first minute. The results are shown in Table.

Water potential surrounding Amoeba (kPa)	Number of times the contractile vacuole filled and emptied in the first minute.
0	19
-100	14
-200	9
-300	5
-400	2
-500	0

- (i) What conclusions can be drawn from the table above.
(ii) Explain why the contractile vacuole emptied more frequently when the water potential surrounding the Amoeba was -100 kPa compared to when the water potential was -400 kPa.

EXODUS COLLEGE WAKISO

8. The graph below shows the effect of starvation on the food stores of the human body.



- (a) Compare the effect of starvation on the quantities of fat and protein stored in the body.
(b) (i) Define the term starvation.
(ii) Explain the trend of each of the foodstuffs with increasing weeks of starvation.
(c) Account for each of the following.
(i) Lipids have a higher energy value than carbohydrates of comparably the same mass.
(ii) Cells of poikilothermic animals have a higher proportion of unsaturated fatty acids than homoeothermic animals.
(d) What is meant by obesity and state its effects.

TURKISH LIGHT ACADEMY

9. In maize the genes for coloured seed and full seed are dominant to genes for colourless and shrunken seed respectively. Pure breeds of double dominant variety were crossed with double recessive variety; and a test cross of the resultant F_1 offspring produced the following.

Phenotype	Number of offspring
Coloured full seed	382
Colourless shrunken seed	394
Coloured shrunken seed	15
Colourless full seed	13

- (a) Suggest explanation for the phenotypic ratio obtained as shown by the results in the table.
(b) Using suitable genetic symbols; show how you have come to conclude as in (a) above.

(c) Calculate the distance in Morgan units between the genes for seed colour and seed shape on a chromosome.

(d) Outline the importance of Cross Over Values in genetics.

MT. ST. HENRY'S HIGH SCHOOL MUKONO

10.(a) With examples, state the type of behavioral stimuli.

(b) Distinguish between hormone and pheromone.

(c) State the importance of pheromones in insects.

(d) Discuss the biological application of pheromones.

BULOBA HIGH SCHOOL

11. (a) Compare myoglobin and haemoglobin molecules.

(b) Explain each of the following observations;

(i) the oxygen dissociation curve for haemoglobin is sigmoid in shape.

(ii) fetal haemoglobin is gradually replaced with adult haemoglobin after birth.

(iii) Individuals with sickle cell trait do not suffer from malaria.

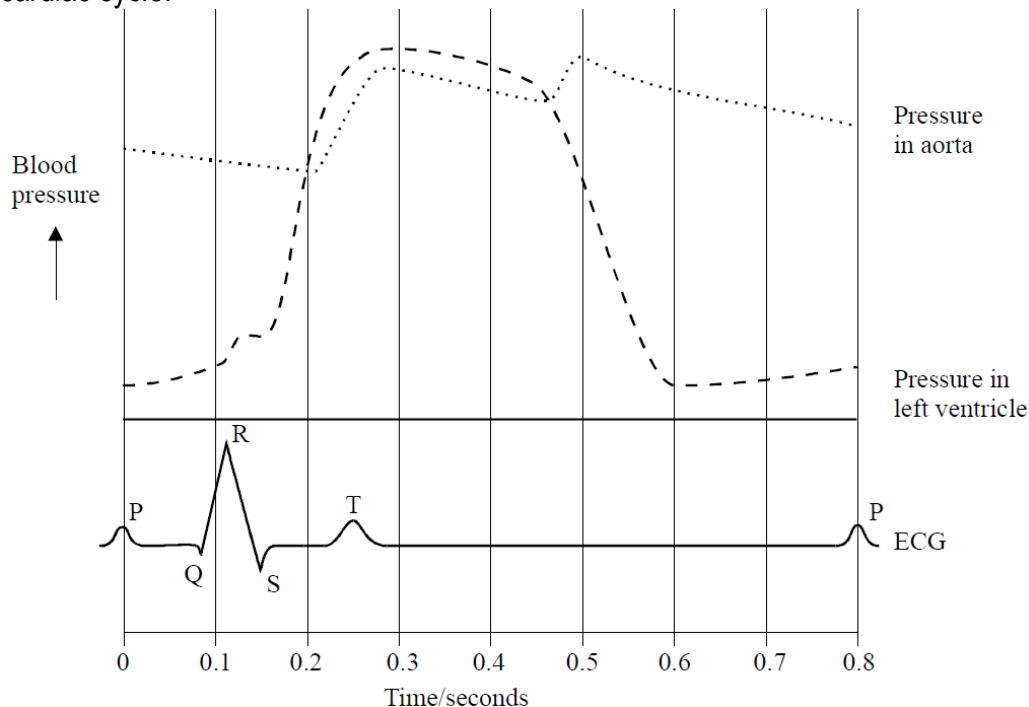
(iv) Earthworms run out of their hideouts on a rainy day.

(c) Explain the significance of red blood cells being impermeable to cations.

(d) How are blood capillaries adapted for their function?

KAJJANSI PROGRESSIVE S.S.

12. The diagram shows an electro-cardiogram (ECG) and the pressure changes during a human cardiac cycle.



(a) (i) Define the term electrocardiogram.

(ii) What does each of the waves shown on the ECG represent and state their significance.

(iii) Explain why there is no change in the electrical activity between 0.31s and 0.77s.

(b) Use the graph to calculate the heart rate of humans.

(c) (i) Compare the pressure changes in the left ventricle and aorta.

(ii) State the significance of the differences stated in (c) (i) above.

(d) The pressure changes shown in the diagram are on the left side of the heart. Sketch a curve on the graph to show the pressure changes in the right ventricle.

(e) Outline the functional properties of heart muscles.

SEETA HIGH MUKONO

13. (a) What is meant by each of the following as applied in pest control.

(i) Lethal dose 50.

(ii) Persistence

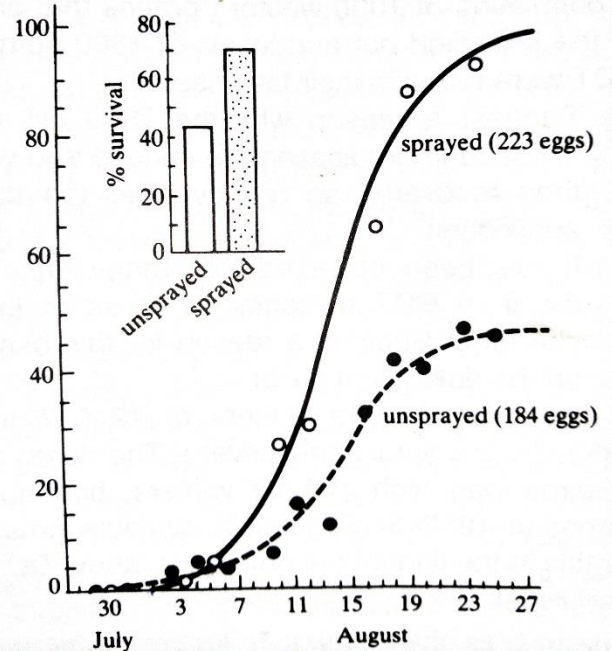
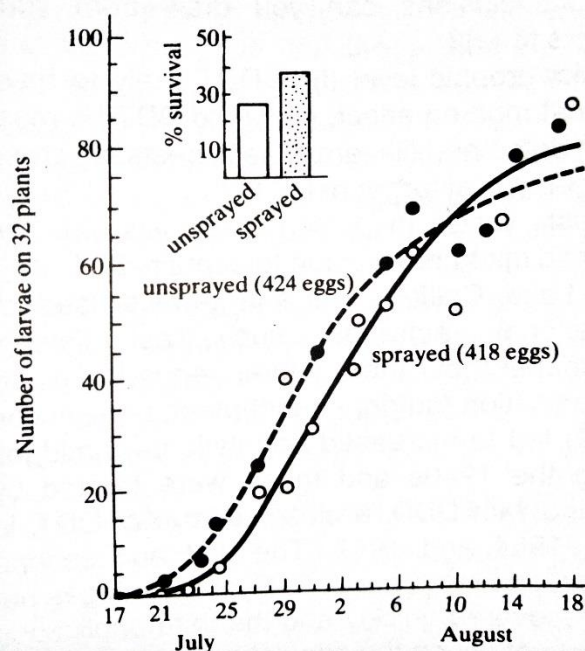
(iii) Pest resurgence.

(iv) Biological control

(b) The figure below illustrates the differential effects of DDT application on crop and soil fauna in the USA. **Pieris rapae** is a cabbage crop pest that feeds on its leaves. Spraying with DDT to control it is effective only for a short period in the first year. The larvae of the Cabbage crop pest are eaten by soil-dwelling ground beetle **Harpalus rufipes**.

(a) 1964 (after one application of DDT, 6 July 1964)

(b) 1965 (after three applications of DDT, 6 July, 20 August 1964 and 28 June 1965)

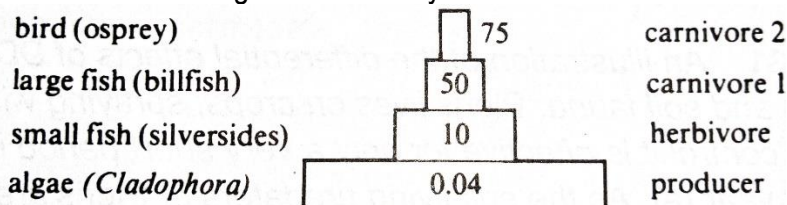


(i) Explain the effect of one application of DDT on **Pieris rapae** population.

(ii) Account for the differences in the number of eggs of **Pieris rapae** at the sprayed and unsprayed farm yards due to three successive applications of DDT.

(c) What advice would you give to the farmer before making the choice of the pesticide?

(d) The figure shows the biomass and amount of DDT in ppm at different trophic levels in a food chain collected during a certain study in the USA.



(i) Account for the trend of change in DDT concentration showed by the figure.

(ii) Suggest ways in which birds such as penguins and hawks in the Antarctic Ocean might have come to contain DDT.

(e) Disturbance of natural ecosystem of originally clear Lake California by eutrophication lead to increased population of midges (mosquitoes/flies) during the 1940s and these were treated by spraying with DDD, a close relative of DDT. The first and second application killed about 99% of the midges but they recovered so quickly that the third application had little effect on their population.

(i) Suggest the observation made following the different DDD applications.

(ii) Animal death due to DDT poisoning is rampant in times of starvation. Explain why this is so.

NAALYA S.S. BWEYOGERERE

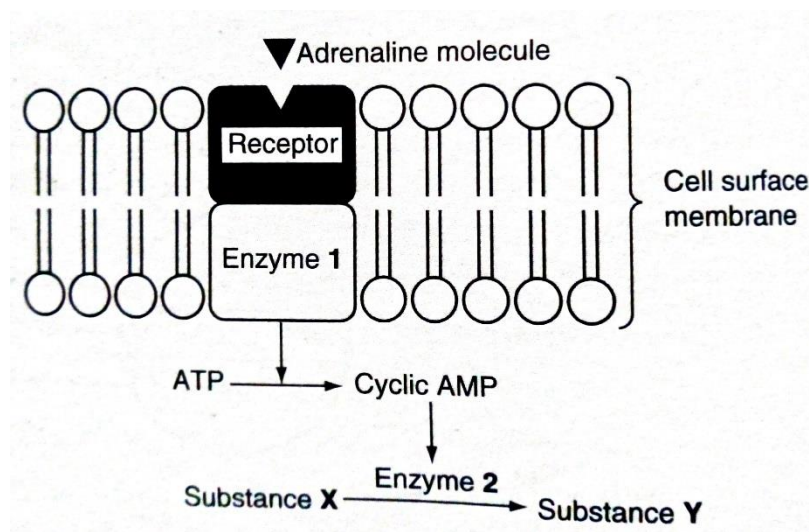
14. (a) The human kidneys process 1200 cm^3 of blood every minute. This 1200 cm^3 of blood contains 700 cm^3 of plasma. As this blood passes through the glomeruli of the kidneys, 125 cm^3 of fluid passes into the renal capsules (Bowman's capsules). This fluid is called the glomerular filtrate and is produced by a process is called ultrafiltration.

(i) Calculate the percentage of plasma that passes into the renal capsules. Show your working.

- (ii) Explain how the structure of the glomerular capillaries is adapted for ultrafiltration.
- (iii) Explain why the epithelial cells of the proximal convoluted tubule have many mitochondria in them.
- (iii) Describe the role of the hypothalamus and kidney nephrons in the control of the osmotic pressure of blood.
- (b) Kidney failure may result in a buildup of urea in the blood, protein in the urine and retention of tissue fluid. Patients with kidney failure may need a transplant. Recipients of transplanted kidneys are treated with drugs that suppress their immune system.
- (i) Explain how ultrafiltration and reabsorption remove urea from the blood without losing essential nutrients such as protein and glucose.
- (ii) Explain the part played by the loop of Henle and the collecting duct in concentrating urine in a healthy individual.
- (iii) Explain the link between protein in the urine and retention of tissue fluid in patients with kidney failure.
- (iv) If not treated with drugs, explain how the recipient's immune system would reject a transplanted kidney.

ST. JOSEPH OF NAZARETH

15. (a) What is meant by **cascade effect** of hormonal action?
- (b) The diagram summarises the way in which adrenaline can control a chemical reaction in a liver cell.



- (a) Describe the function of cyclic AMP in this process.
- (b) Give an example of a chemical reaction in a liver cell which is controlled by adrenaline by naming substance X, Substance Y, and enzyme 2.
- (c) Use the diagram to explain:
 - (i) why adrenaline may affect some cells and not others.
 - (ii) how a single molecule of adrenaline may cause this cell to produce a large amount of substance Y.

- (d) Differentiate between peptide and steroid hormones.

MT. ST. MARY'S COLLEGE NAMAGUNGA

16. (a) Describe the modification of Munch's theory of translocation.
- (b) Describe stomatal movement basing on mineral ion change theory.
- (c) What are the evidences to reflect that active movement of sugars within the sieve tube is based on the activity of the companion cells?
- (d) Suggest a mechanism by which rise in abscisic acid concentration leads to closure of stomata.

ST LUCIA S.S. NAMAGOMA

17. Describe how each of the following affect distribution and abundance of plants.

- (a) Temperature (b) Sunlight (c) Altitude

ST. BALIKUDEMBE S.S. KISOGA

18. (a) Explain

- (i) the origin of genetic diversity in a population (ii) the effect of cross-breeding in agriculture.
- (b) Describe mechanisms in plants to increase genetic variability. **GREENHILL ACADEMY**

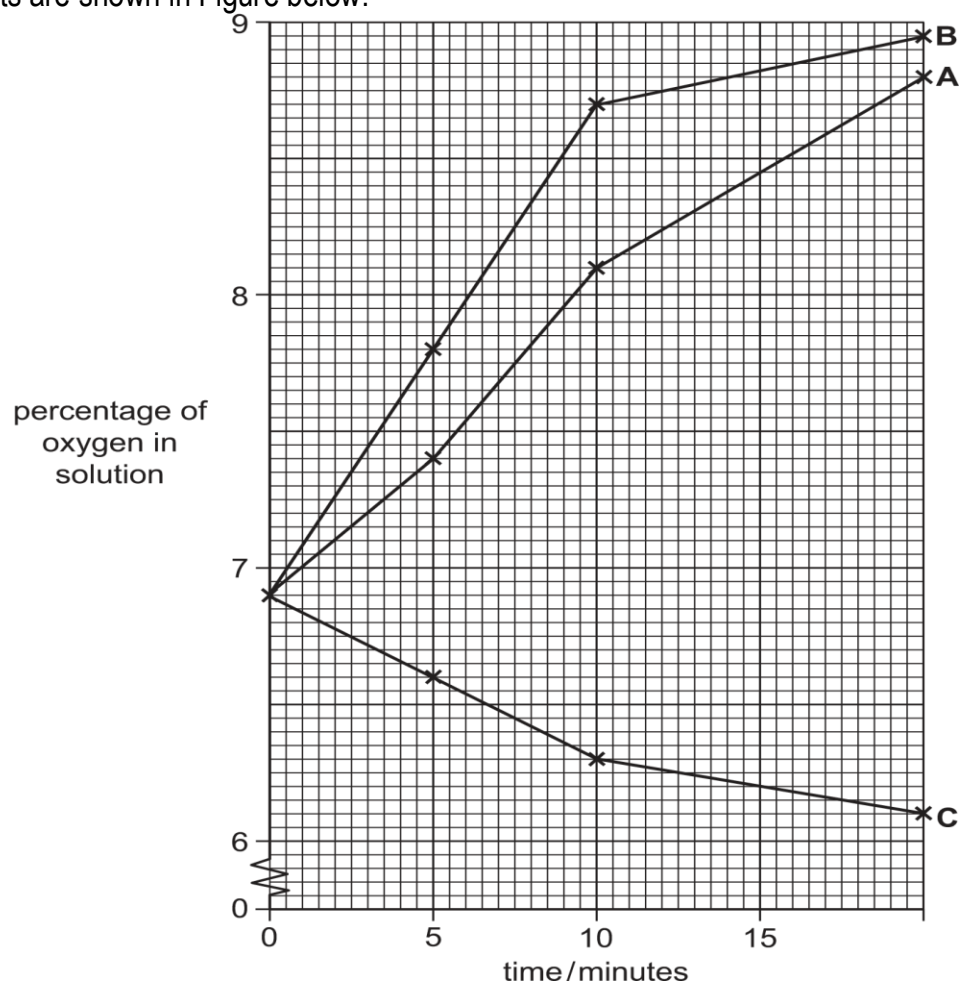
19. (a) Describe mechanisms in the human body by which it;
 (i) carries out osmoregulation. (ii) regulates pH of blood.
 (b) Using suitable examples; state circumstances under which body homeostasis may be under positive feedback.

ST. CYPRIAN HIGH SCHOOL KYABAKADDE

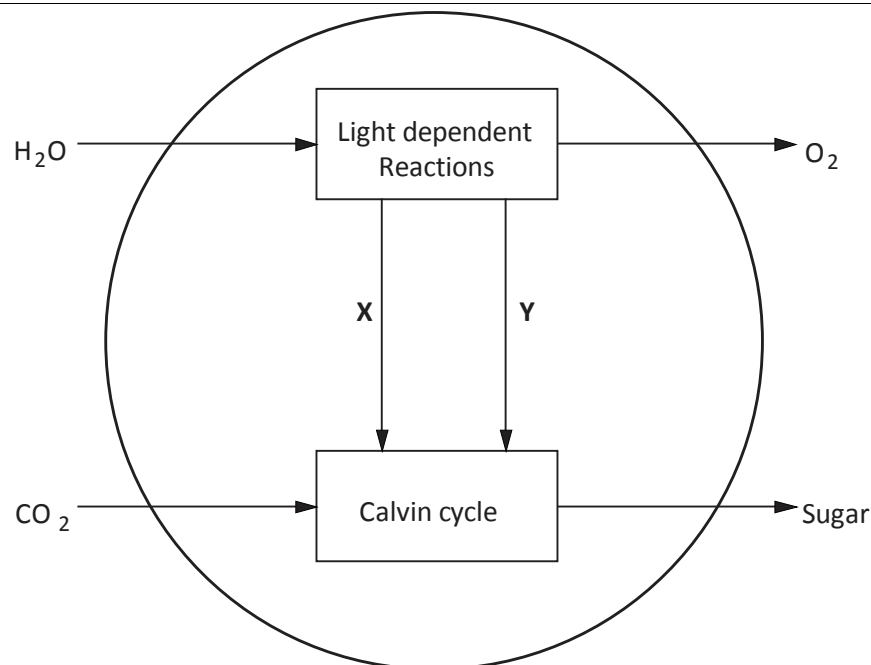
20. (a) The following experiment was carried out to investigate the effect of light intensity on the rate of photosynthesis of a water plant, Elodea.

- Elodea was cut into three pieces, each 10 cm long.
- Each piece of Elodea was placed in a glass tube, containing 0.5% sodium hydrogen carbonate solution, which was then sealed with a stopper.
- Tube **A** was placed 10 cm away from a lamp.
- Tube **B** was placed 5 cm away from a lamp.
- Tube **C** was placed in a dark room.
- An oxygen sensor was used to measure the percentage of oxygen in the solutions at the start of the experiment and again at 5, 10 and 20 minutes.

The results are shown in Figure below.



- (i) Describe the changes in the percentage of oxygen in solution for tubes A and C.
 (ii) State why sodium hydrogen carbonate solution was used.
 (iii) Calculate the mean rate of oxygen production for tube **A** for the 20 minutes of the experiment.
 (iv) Compare the results for tubes **B** and **C**.
 (v) Explain the results for tube **C**.
 (vi) Suggest what factor, which may have an effect on the rate of photosynthesis, was **not** taken into account in this experiment.
- (b) Figure below shows the relationship between the light dependent and light independent reactions in a chloroplast.



- (i) Name substances **X** and **Y** in Figure above.
- (ii) Describe the steps involved in the formation of the products in the above reactions.
- (iii) Explain what makes C_4 plants more photosynthetically efficient than C_3 plants.

ROYAL COLLEGE BULOBA

21. (a) Outline the properties of receptors.
- (b) Describe the role played by the organ of corti in the mammalian ear.
- (c) An individual who has been spinning for quite long feels dizzy when one suddenly stops. Explain why this is so.

ST. PETER'S S.S. NAALYA

22. (a) Explain the mechanism of organic evolution.
- (b) Describe the factors that lead to the deviation from Mendel's laws of inheritance.

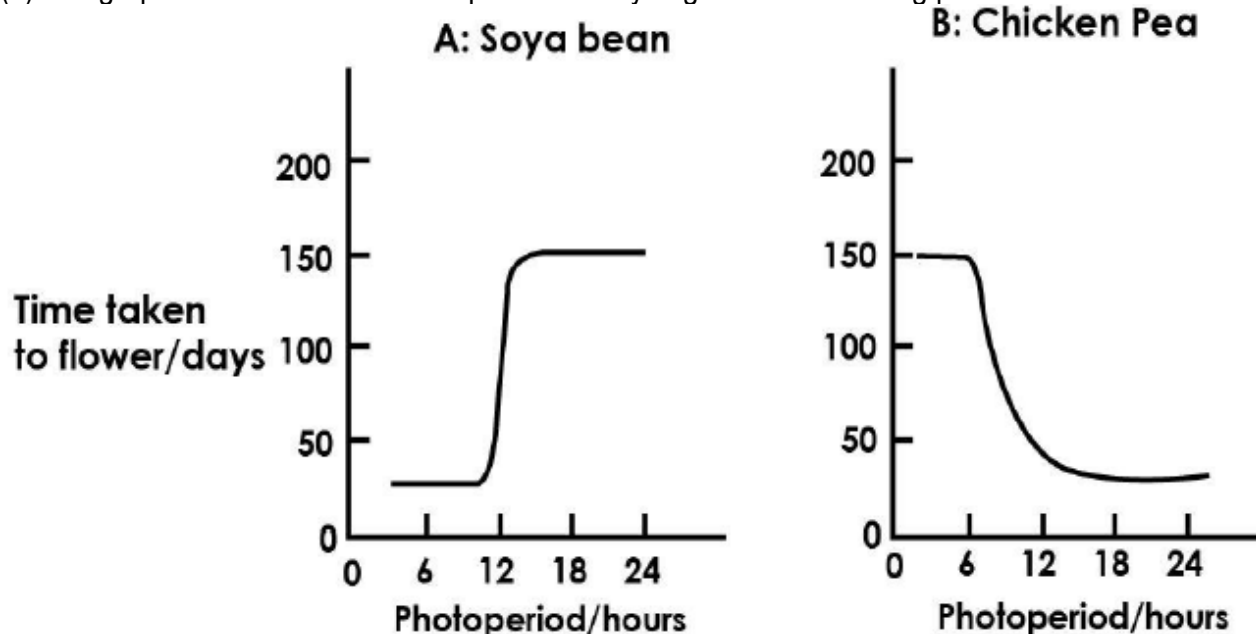
KISUBI MAPEERA S.S

23. (a) What is meant by:

(i) Photoperiodism

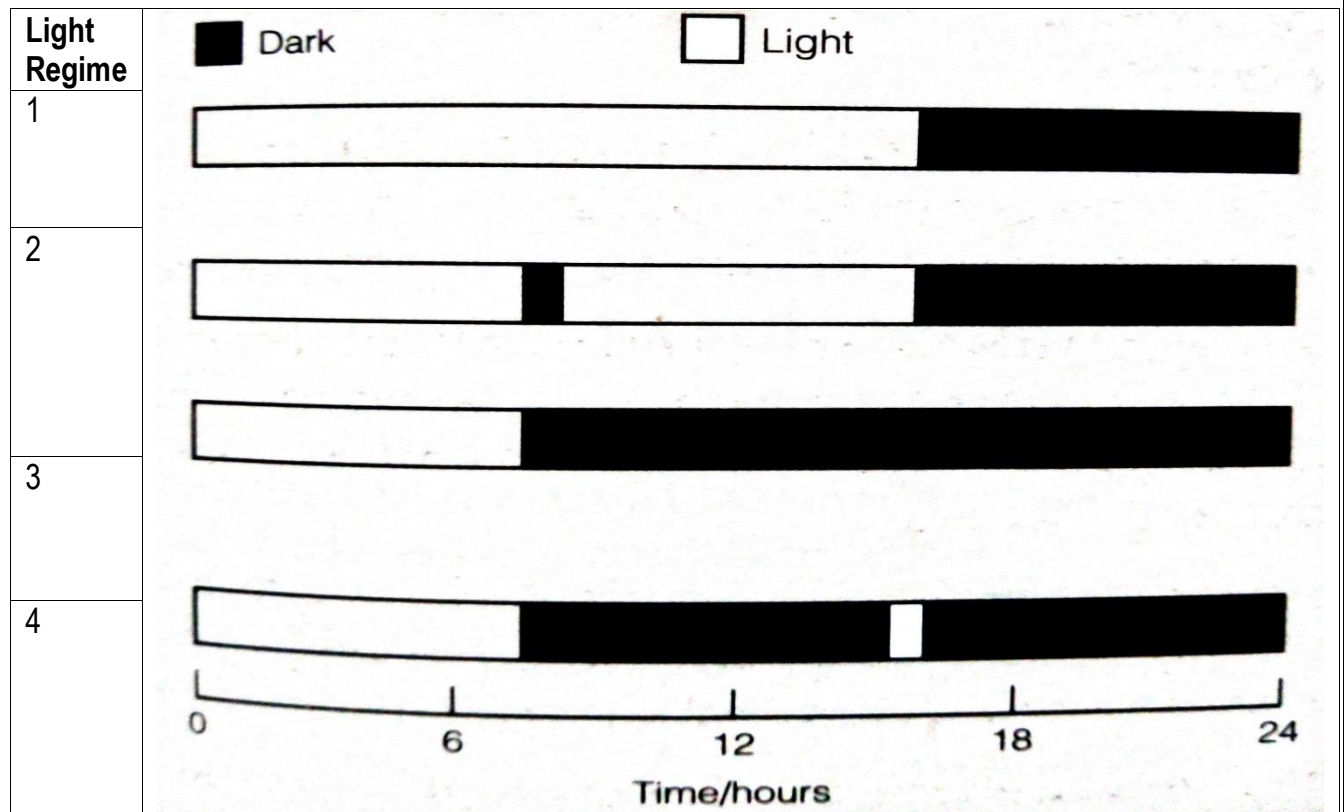
(ii) Phytochrome

- (b) The graphs below indicate the responses to daylength of two flowering plants.



- (i) Which one of the plants will flower under long-day conditions? Give a reason.
- (ii) Describe the role of phytochrome in the flowering process.

(c) The figure below shows an investigation of the different light and dark periods on flowering of short day and long day plants.



Explain the effect the different light and dark regimes on the flowering of both short day and long day plants.

(i) Regime 1

(ii) Regime 2

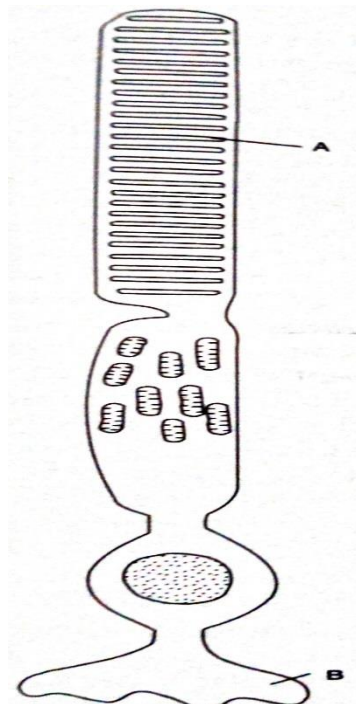
(iii) Regime 3

(iv) Regime 4

(d) Chrysanthemum plant flowers are produced commercially under glass throughout the year. At certain times of the year growers cover the greenhouse with black polythene for part of the day. Account for this in terms of photoperiodism.

JJINJA COLLEGE SCHOOL

24. The diagram besides is of a rod cell.



(a) Name the parts labelled A and B and give one function of each.

(b) Describe other features of rod cells that enable them perform their function in the mammalian eye.

(b) Draw an arrow next to the diagram to indicate the direction in which light passes through this cell.

(c) State two ways in which vision using cones differs from vision using rods.

(d) Explain how light energy falling on a rod cell in the retina of the eye is converted to electrical energy.

(e) Explain why an individual is temporarily blinded when one moves from bright light into a dimly light room.

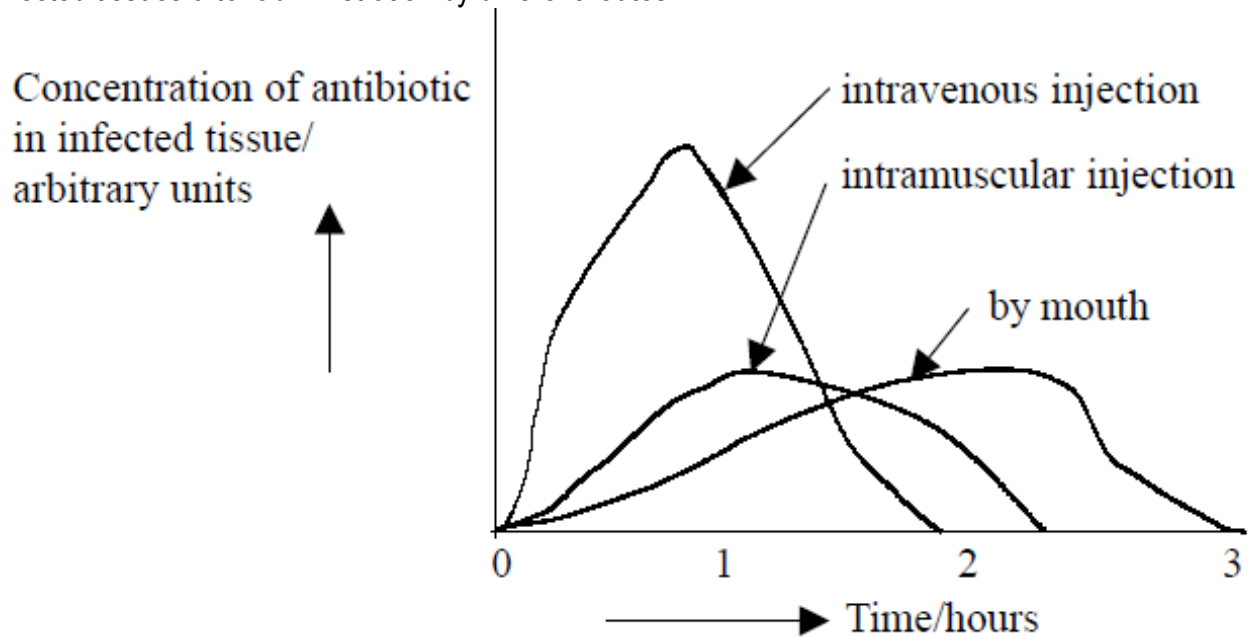
(f) Explain how the possession of different types of cone cell helps us to see:

(i) blue light;

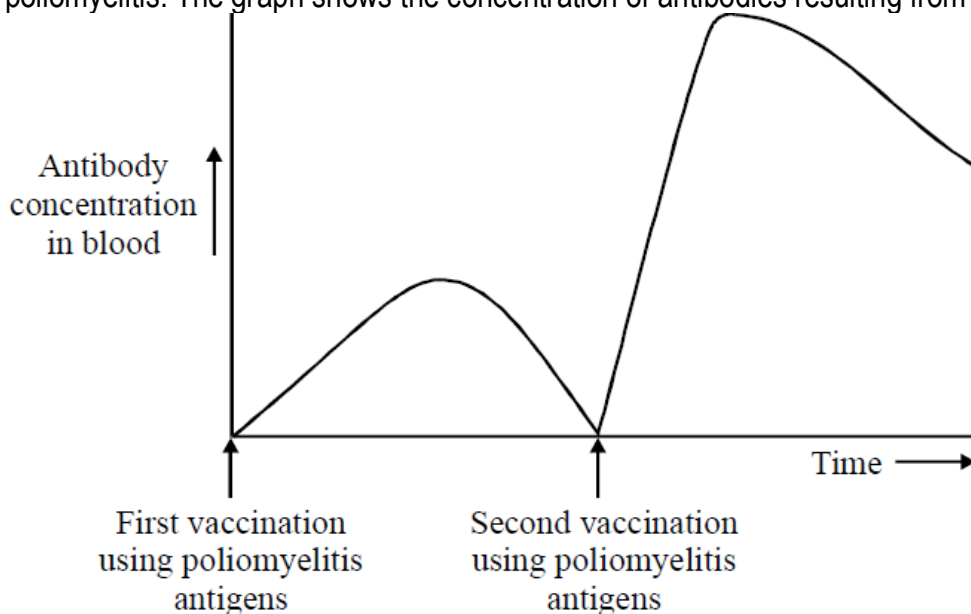
(ii) white light.

BUGEMA ADVENTIST HIGH SCHOOL

25. The graph below shows the time taken for an antibiotic to reach certain concentrations in infected tissues after administration by different routes.



- Differentiate between the terms 'antibiotic' and 'antibody'.
- What conclusions can be drawn from the graph about the three methods of antibiotic administration?
- Suggest reasons for the different concentrations in infected tissue achieved by the different methods of administration.
- Antibodies may sometimes be injected into people. Explain why this is so.
- Suggest explanations for the following facts;
 - The female *Anopheles* mosquito can transmit the malarial parasite (*Plasmodium*) from human to human but does not act as a vector for the HIV virus.
 - HIV positive individuals are more prone to infection by organisms causing diseases such as tuberculosis and pneumonia.
- A child was given two vaccinations consisting of antigens from the virus which causes poliomyelitis. The graph shows the concentration of antibodies resulting from these vaccinations.

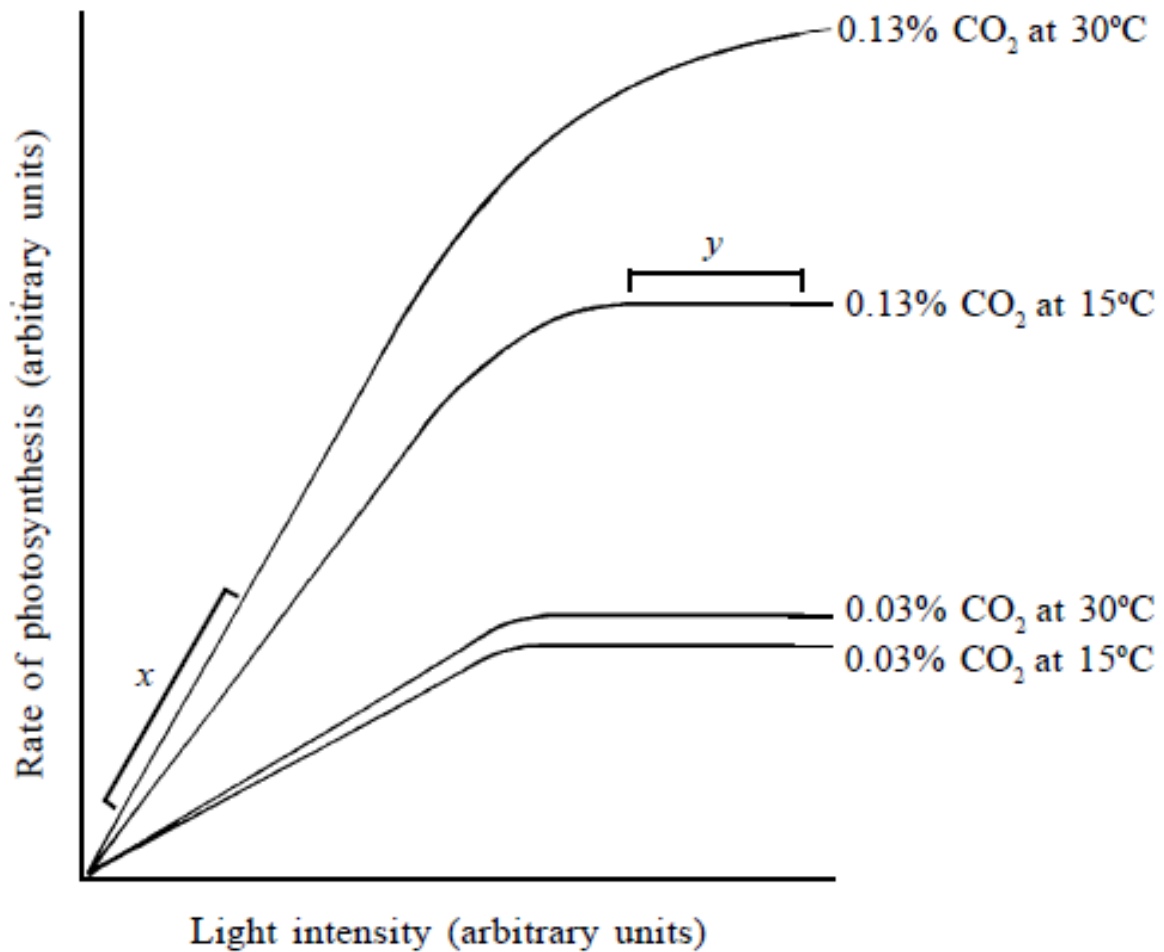


- What is a poliomyelitis antigen?
- Describe and explain the difference in the child's response to the two vaccinations shown in the graph.

(iii) Immunisation programmes may use either attenuated or dead microorganisms. Suggest why there might be problems for the patient when using these vaccines.

KIBULI S.S.

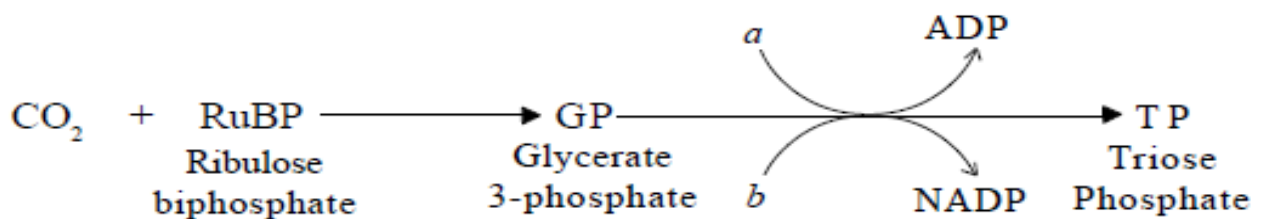
26. (a) The graph below shows some of the effects of light intensity, carbon dioxide, and temperature on the rate of photosynthesis.



(i) Use the graph to explain the term 'limiting factor'.

(ii) Suggest why, on hot bright summer days, commercial greenhouses may use fans to cool the greenhouses.

(b) The diagram below shows some of the steps in the light independent stage of photosynthesis.



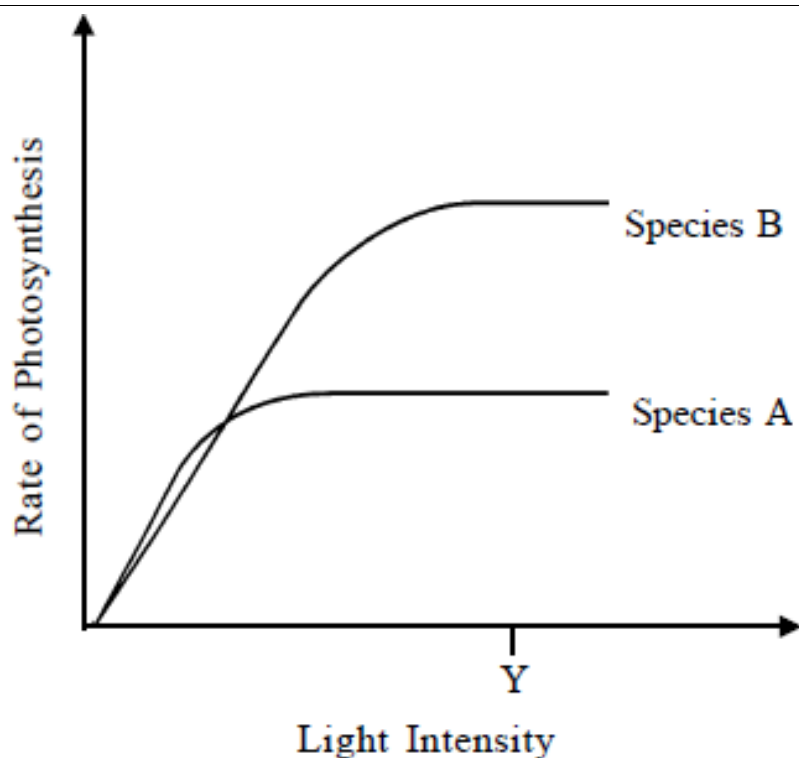
Identify substances a and b produced in the light dependent stage of photosynthesis.

(c) Suggest explanations for the following observations:

(i) At sunset, the concentration of glycerate-3-phosphate in chloroplast stroma begins to increase rapidly.

(ii) During the night, the level of glycerate-3-phosphate eventually levels off.

(d) The graph shows the effect of light intensity on the rates of photosynthesis of plant saplings growing in a woodland. One species normally grows in direct sunlight, the other species normally grows in shaded conditions.



- (i) Suggest which species normally grows in shaded conditions. Explain your answer.
- (ii) How are shade plants adapted to ensure that they are photosynthetically efficient?
- (iii) Suggest which factor is limiting the rate of photosynthesis of species A at light intensity Y.

(e) The light compensation point for three woodland species is shown in the table below. The average light compensation point for plants in this woodland is 1150 lux.

Species	Light compensation point (lux)
A	2000
B	350
C	900

- (i) Define Light compensation point.
State and explain which of these three species:
- (ii) normally grows in bright sunlight
- (iii) has leaves with the highest chlorophyll content.

ENTEBBE S.S.

27. (a) Discuss how each of the following overcome the major challenge in their environment.

- (i) hydrophytes (ii) halophytes (iii) Camel
- (iv) Salmon fish (v) Marine elasmobranchii
- (b) Differentiate between osmoconformers and osmoregulators.

GAYAZA HIGH SCHOOL

28.(a) Explain saltatory conduction in myelinated nerve fibres.

- (b) Compare the structure and suitability of slow twitch and fast twitch muscles to their function.
- (c) Skeletal muscles of an individual who has died eventually stiffen. Explain the physiological changes that result into this observation.

(d) During exercise, the rate of respiration of muscle cells increases. Explain what causes human haemoglobin to unload more oxygen to these cells.

LIGHT ACADEMY S.S.

29. (a) Describe the mechanism by which the respiratory surfaces of an insect are ventilated.

(b) In many of the lugworm gills, the blood flows in the opposite direction to the current of water passing over them. Explain the advantage of this arrangement.

(c) Differentiate between the breathing system of mammals and that of insects.

(d) Explain why the rate of water loss during gaseous exchange in insects is very low as compared to that in mammals.

(e) Air is a better respiratory medium than water. Explain why this is so.

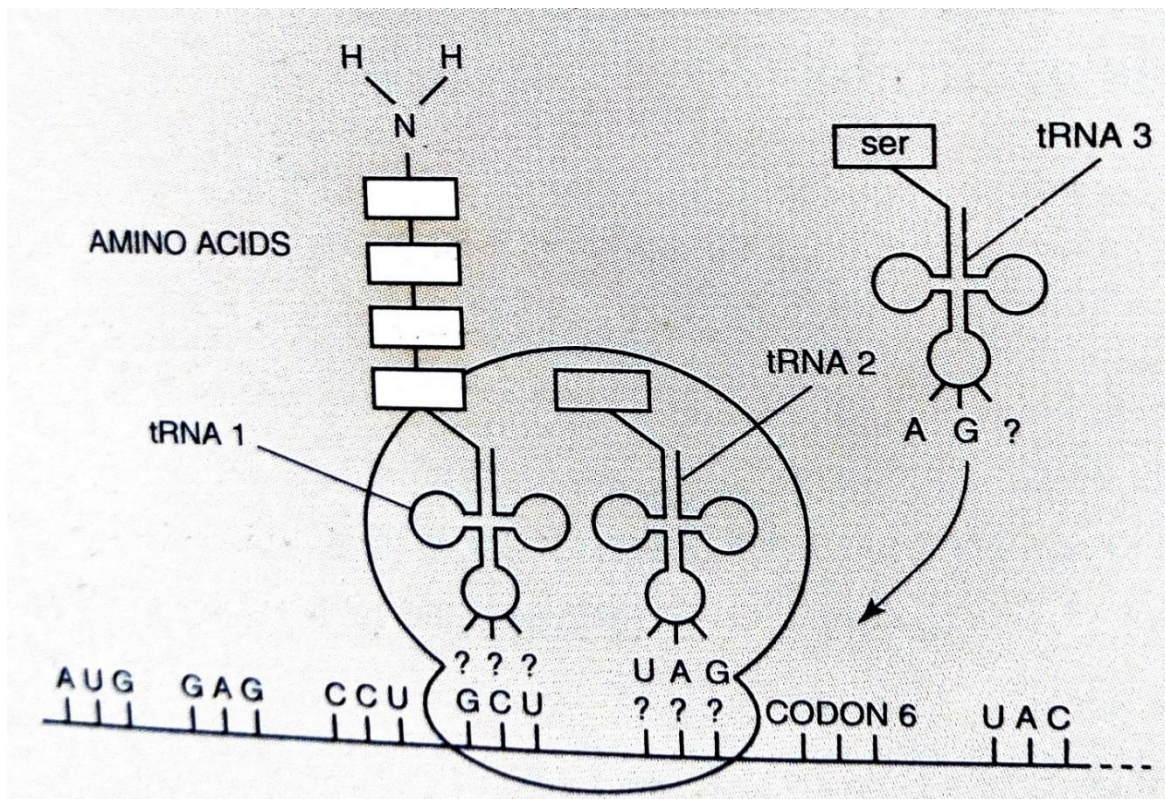
ST. MICHAEL HIGH SCHOOL SSONDE

30. (a) Describe, with aid of annotated diagrams the essential features of the process of meiosis in a cell whose diploid number of chromosomes is 4.

(b) Give an account of how meiosis leads to evolution in a species.

ST. HENRY'S COLLEGE MBALWA

31. The diagram below summarises the processes of protein synthesis. Use it to answer the questions that follow.



- (a) (i) Which is the first tRNA anticodon used in protein synthesis from this mRNA?
- (ii) What is the anticodon sequence in tRNA 1?
- (iii) Give the DNA triplet code which is recognised by tRNA 2.
- (b) (i) Explain what changes will occur in the translation apparatus to allow codon 6 to be translated.
- (ii) What are the possible codon sequences for codon 6?
- (c) Explain why mutations involving the deletion of a base may have greater effects than those involving substitution of one base for another.
- (d) (i) Precisely describe how errors are minimized during DNA replication.
- (ii) Describe how errors that occur during DNA can lead to sympatric speciation.
- (e) What is the significance of DNA duplication prior to mitosis?
- (f) Describe how DNA controls the behavior and physical appearance of an organism.

ST. MICHAEL INTERNATIONAL SCHOOL WAKISO

32. (a) Describe the asynchronous and synchronous contractions of muscles in insects.

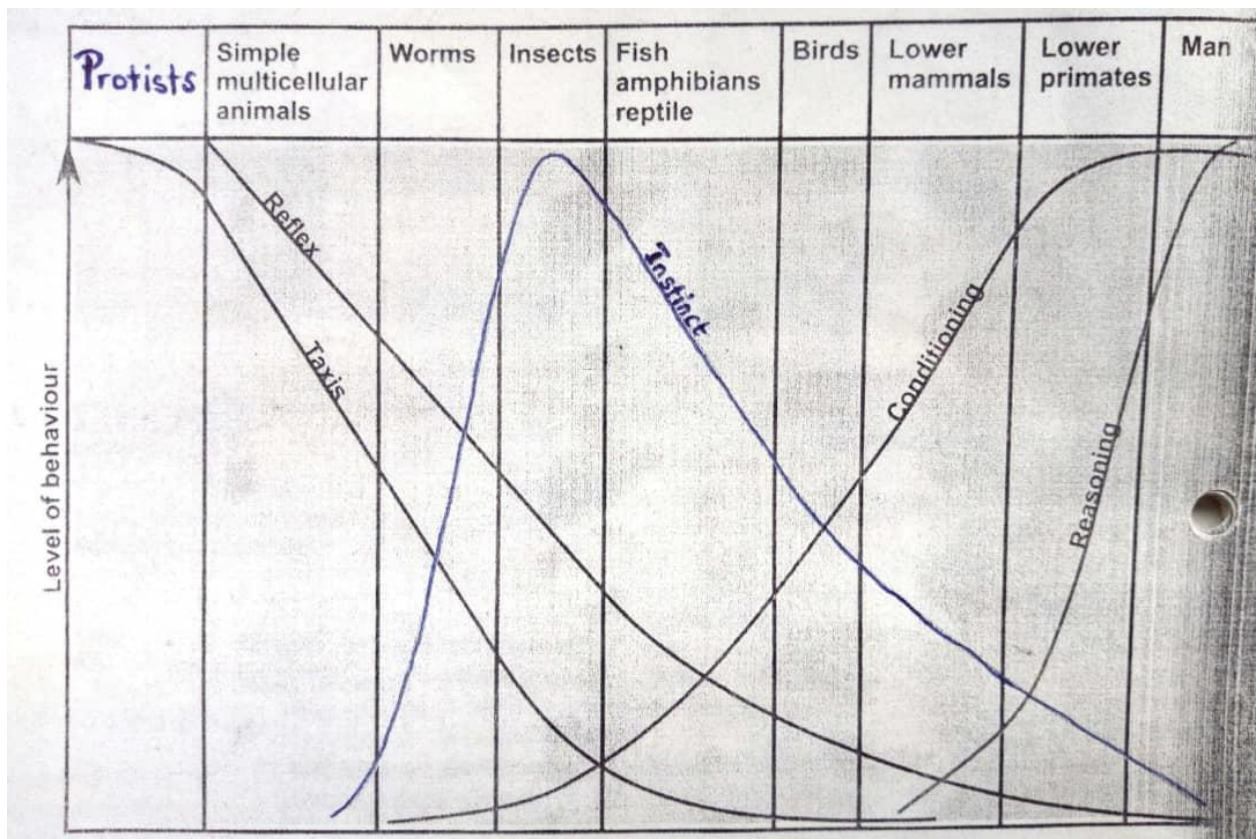
(b) Describe the bird's wing as an aerofoil.

(c) Discuss the properties of skeletal muscles.

(d) Describe the process of; (i) muscle contraction. (ii) muscle relaxation

GAYAZA CAMBRIDGE COLLEGE

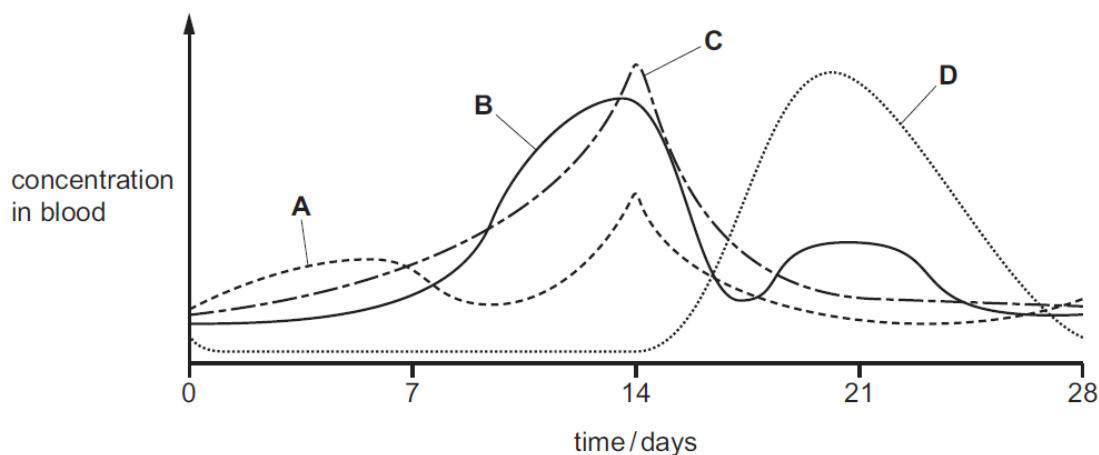
33. The graphs in the figure below show the dominant behaviour patterns studied in invertebrates and vertebrates. Carefully study them and answer the questions that follow.



- Describe the behaviours which are a result of taxis and reasoning in the experimental animals specified above.
- Comment on the behaviour patterns illustrated in the graphs above.
- Categorise the above behaviours in to the two major types of behaviour.
- From your knowledge of the organisms above what conclusion(s) can you draw from the graphs?
- What explanation can suit your conclusion(s) in (d) above?

MERRYLAND HIGH SCHOOL

34. The graph shows the rise and fall of pituitary and ovarian hormones during the human ovarian cycle.



- Outline the role of hormones; (i) B (ii) C
- Was the lady pregnant at the end of the cycle or not? Give reason for your answer.
- Some animals like rotifers and aphids are able to alternate between sexual and asexual reproduction. Under what conditions might it be advantageous to reproduce; (i) sexually? (ii) asexually?
- Explain what might cause the variation in length of human menstrual cycle.
- Explain why oral contraceptives (pills) are rich in hormone D.

(g) The embryos of reptiles, birds and mammals have systems of extra embryonic membranes. What are the functions of these membranes, and how do fish and frog membranes survive without them?

BUDDO S.S.

35. In an experiment to investigate the respiratory metabolism of yeast, the latter was mixed with 1% glucose solution. The carbon dioxide evolved was passed through oil and the volume of oil displaced by carbon dioxide (cm^3) was recorded in the table 1 below.

Time/minutes	Volume of oil displaced/ cm^3
0	0
4	5
8	10
12	15
16	21
20	30
28	40
32	41

In another experiment, the ability of the yeast to metabolise a range of different carbohydrates, all at the same conditions was estimated by measuring the volume of oil displaced by the carbon dioxide evolved after 20 minutes of running each experiment. The results are shown in the table II

Carbohydrates	Volume of oil displaced/ cm^3
Glucose	8.7
Sucrose	5.9
Lactose	0.0
Maltose	6.1
Starch	0.8
Fructose	8.9
No carbohydrate	0.9

- Comment on the results obtained in table I and II.
- Suggest the type of curve that would be obtained if the results in table I were plotted on a suitable graph and give reasons for your answer.
- Explain your reasons in (b) above.
- Predict what would happen to the volume of oil displaced if the experiment were continued for more hour.
- What was the aim of the experiment in table (II)?
- (i) Suggest with reasons the food substance that yielded high carbon dioxide concentration.
- (ii) Explain why the volume of oil displaced from metabolism of starch and lactose were the least.

NANSANA ST. JOSEPH'S S.S.

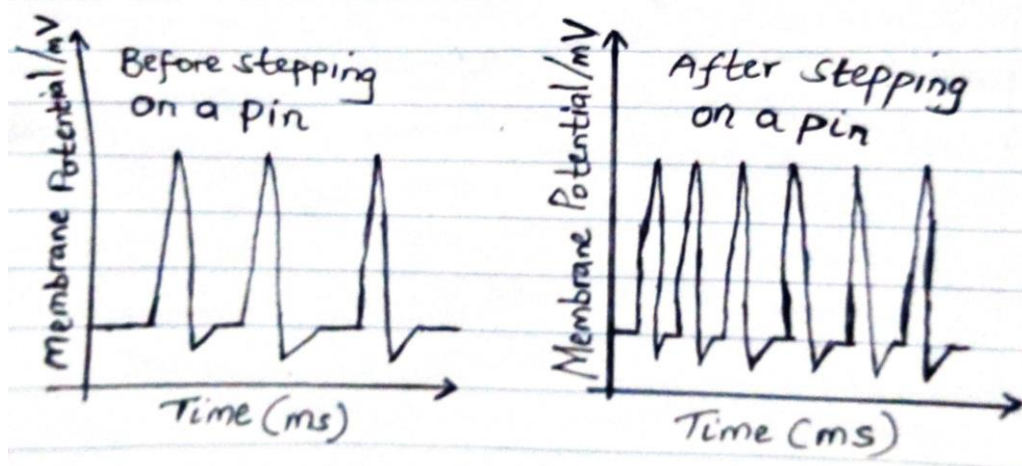
36. (a) Describe how abnormal haemoglobin arises in a human population.
- Explain the effect of the gene for abnormal haemoglobin in humans.
 - Describe the life cycle of Plasmodium.
 - What are the adaptations of plasmodia to its parasitic mode of life?
 - Why is malaria severe in sub Saharan Africa?

ST. LAWRENCE HORIZON MAYA

38. (a) Describe with the aid of diagrams how each of the following types of movement occur.
- Cillitary movement
 - Amoeboid movement
- (b) What is the importance of ciliary and amoeboid movements in humans?

KIIRA COLLEGE BUTIKI

38. The graphs in the figure below show the rate at which the sensory neuron triggers action potentials when an s.6 student steps on a pin and before stepping on it.



- (a) Explain the changes in the membrane voltage of the sensory neuron:
- before the student steps on a pin
 - after the student steps on a pin
- (b) State and explain what will happen if the student swallows some pain killers.
- (c) Explain why an odour at first is strong but seems to fade with time even when the substance producing it is still there.
- (d) (i) What enables a receptor in a taste bud to key on just a certain type of chemical in food?
(ii) what determines the "taste" that is perceived in response to that particular chemical?
- (e) Account for the different types of receptors found in human skin.

UGANDA MARTYR'S HIGH SCHOOL RUBAGA

39. (a) Describe the physiological behavior of the rods during;
- darkness
 - low light intensity
 - exceedingly high light intensity
- (b) Explain the significance of the compactness of cones at the fovea.

FAITH HIGH SCHOOL

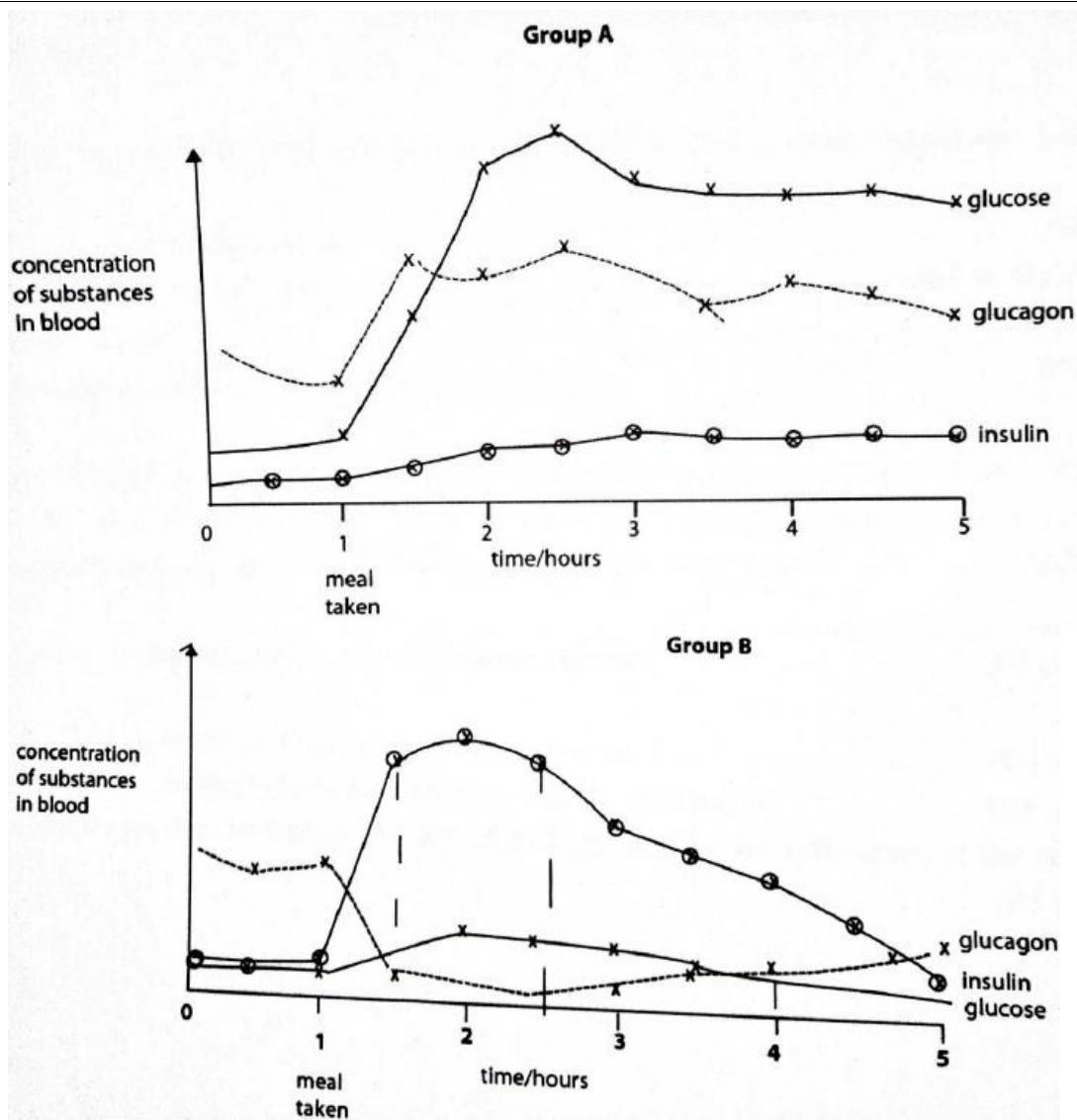
40. (a) Explain how Amino acids are able to regulate the PH of blood.
- (b) How does the lock and key theory explain how enzymes function?
- (c) Explain how allosteric inhibitors regulate cell metabolism.

41. (a) Explain the mechanism of organic evolution.
- (b) Describe the factors that lead to the deviation from Mendel's laws of inheritance.

42. (a) Explain the changes which occur to the bitten part of the human body by the wasp
- (b) Describe how the B lymphocyte defend the body against infections

43. (a) Describe the changes in the;
- pressure potential,
 - water potential of the plasmolysed plant cell when inserted in a hypotonic solution.
- (b) Account for the negative water potential of any solutions. **JJINJA PROGRESSIVE S.**

44. In one form of diabetes, the pancreas is unable to make sufficient insulin. In an investigation, twenty people were divided into two groups. Group A contained ten people with this form of diabetes, while group B contained ten people without diabetes (control). Blood samples were taken from each person at 30 minutes' intervals and the amount of glucose, insulin and glucagon measured. After one hour, each person ate a meal containing large amount of carbohydrate. Mean concentrations were calculated for each substance at each sampling time. The results were shown in the graphs below.



- Explain the relationship between glucose concentration and insulin in
 - Group A.
 - Group B.
- Explain the variation of glucagon hormone in group A and B.
- Predict what would happen to the glucose concentration of people of group A if they ate carbohydrate for another 24 hours. Explain your answer.
- Other than the concentration of glucose in blood, what other factors must be regulated in the internal environment (tissue fluid).

ST. HENRY'S COLLEGE KITOVU

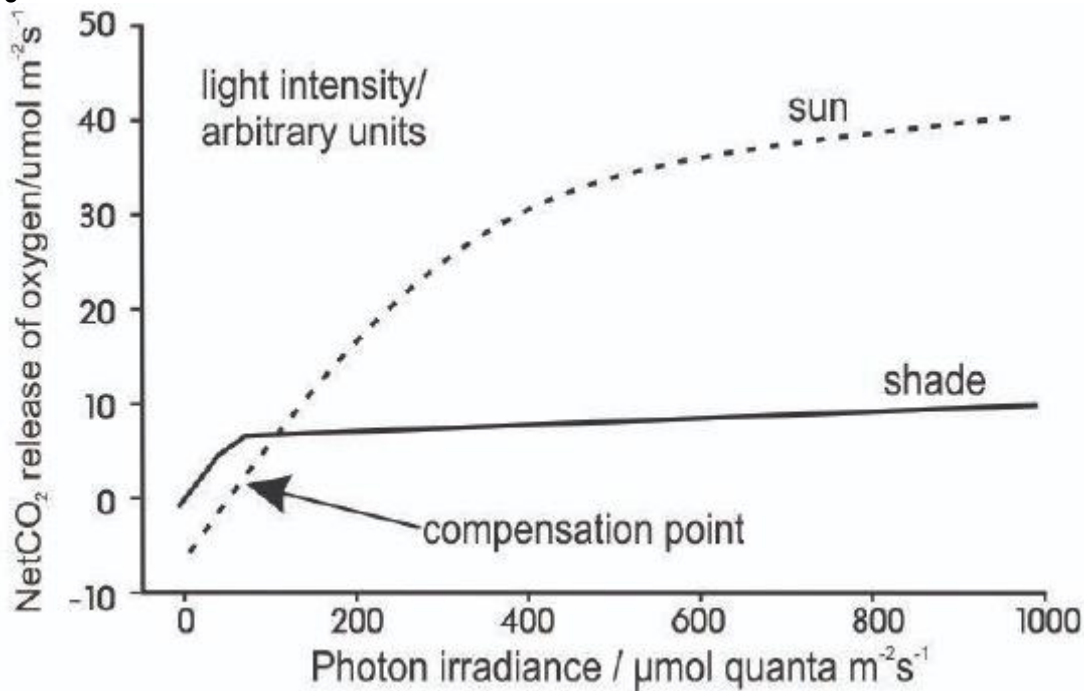
- Describe how the stratosphere is destroyed
 - Outline the indicators to support the destruction of the stratosphere
- What is meant by an indicator species?

SAITAH HIGH SCHOOL

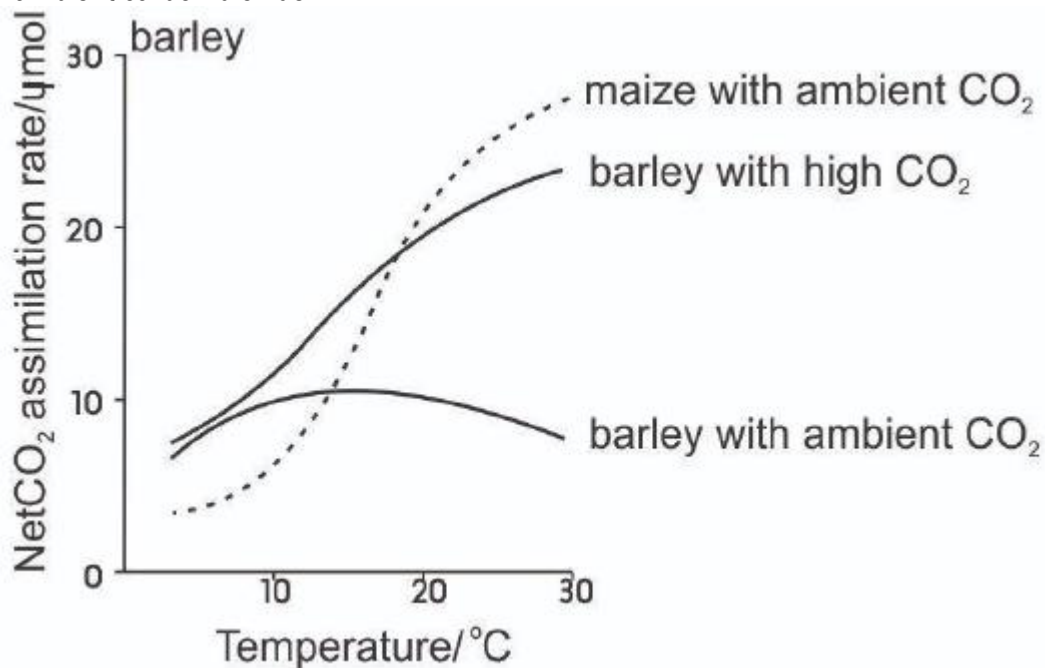
- Explain how the following are determined:
 - ABO blood groups
 - Sex in Man
 - Explain Charles Darwin's finches in terms of evolution

STANDARD HIGH SCHOOL ZZANA

46. The figure 1 below shows the effect of increasing light intensity on the rate of release of oxygen of two wood plants, a sun plant and a shade plant .The sun plant is a tall tree while the "shade plant "grows on the woodland floor.



- (a) (i) Compare the effect of increasing light intensity on the two plant types
(ii) Explain the effect of increasing the light intensity on the sun plant
(iii) Suggest and explain the reason for the difference in the effect of increasing light intensity on the two plants
(b) The figure 2 below shows the effect of increasing temperature on the net assimilation rate of carbon dioxide of barley and maize plants. Barley was grown at different temperatures in ambient (normal atmospheric) and high levels of carbon dioxide. Maize were grown at different temperatures in ambient carbon dioxide.



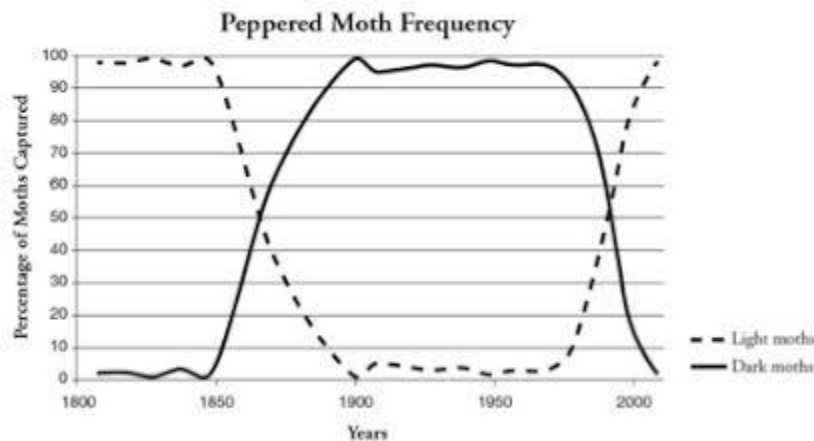
- (i) Explain the effect of increasing carbon dioxide concentration and temperature on the net carbon dioxide assimilation rate of barley.

- (ii) Explain the difference in the effect of increasing temperature on the uptake of carbon dioxide in maize at ambient carbon dioxide concentration compared with the effect of Barley
- (iii) Use Figure 2 to suggest and explain why C4 plants tend to be found in hotter, more arid regions than C3 plants.

KITANTE HIGH SCHOOL

47. (a) What is meant by each of the following?

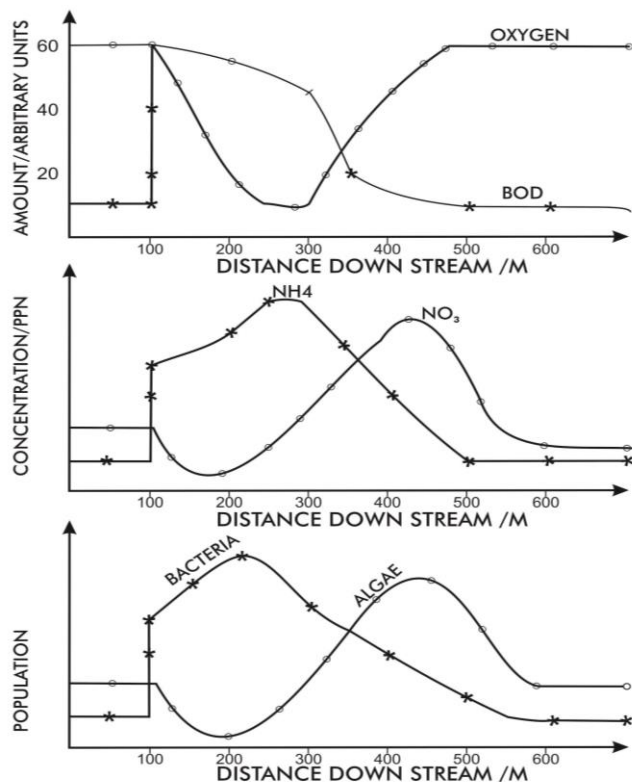
- (i) Polymorphism. (ii) Industrial melanism.
- (b) Differentiate between transient and balanced polymorphism.
- (c) Outline the causes of polymorphism in a population.
- (d) What is the importance of polymorphism in a population?
- (e) The figure shows the changes in the frequency of Peppered Moths in the U.K. recorded over a period of 200 years.



- (i) What evolutionary phenomenon is under study as shown by the graph?
- (ii) Explain the changes in frequency of peppered moth varieties over the course of study.
- (iii) Suggest possible ways how the dark form of moth came into existence.

KABOWA HIGH SCHOOL

48. The graphs below indicate the effect of sewage discharge at 100 meters of the river towards its biotic and abiotic environments. Study them carefully and answer the questions that follow.



- (a) Define the term B.O.D.
- (b) Explain the effect of sewage discharge towards;
- (i) Oxygen (ii) BOD, downstream
- (c) Account for the changes in the concentration of;
- (i) Ammonium ions, (ii) Nitrate ions, downstream
- (d) Account for the changes in the population of;
- (i) Bacteria, (ii) Algae, downstream
- (e) Suggest the likely effects of the population changes of algae to the river between 200m – 450m, when it occurs for a long period of time, downstream.

SSAKU HIGH SCHOOL