

Aga Khan University Examination Board

Notes from E-Marking Centre on SSC II Biology Examination May 2016

Introduction

This document has been produced for the teachers and candidates of SSC Part II (Class X) Biology. It contains comments on candidates' responses to the 2016 Secondary School Certificate (SSC-II) Examination indicating the quality of the responses and highlighting their relative strengths and weaknesses.

E-Marking Notes

This includes overall comments on candidates' performance on every question and some specific examples of candidates' responses which support the mentioned comments. Please note that the descriptive comments represent an overall perception of the better and weaker responses as gathered from the e-marking session. However, the candidates' responses shared in this document represent some specific example(s) of the mentioned comments.

Teachers and candidates should be aware that examiners may ask questions that address the Student Learning Outcomes (SLOs) in a manner that requires candidates to respond by integrating knowledge, understanding and application skills they have developed during the course of study. Candidates are advised to read and comprehend each question carefully before writing the response to fulfil the demand of the question.

Candidates need to be aware that the marks allocated to the questions are related to the answer space provided on the examination paper as a guide to the length of the required response. A longer response will not in itself lead to higher marks. Candidates need to be familiar with the command words in the Student Learning Outcomes which contain terms commonly used in examination questions. However, candidates should also be aware that not all questions will start with or contain one of the command words. Words such as 'how', 'why' or 'what' may also be used.

Constructed Response Questions (CRQs)

Detailed Comments:

Question 1a

Write TWO similarities between photosynthesis and respiration.

Better responses wrote specific similarities between photosynthesis and respiration, i.e. both processes use electron transport chain/ both produce water/ both are redox reactions.

Example:

- Both involves the gaseous exchange from the atmosphere. In photosynthesis's CO_2 is taken from the atmosphere, giving out O_2 , as O_2 from the atmosphere is utilized by respiration.
- Both are the biochemical reactions that includes the oxidation and reduction of glucose. Both gases are common in both the reactions, i.e. O_2 and CO_2 .

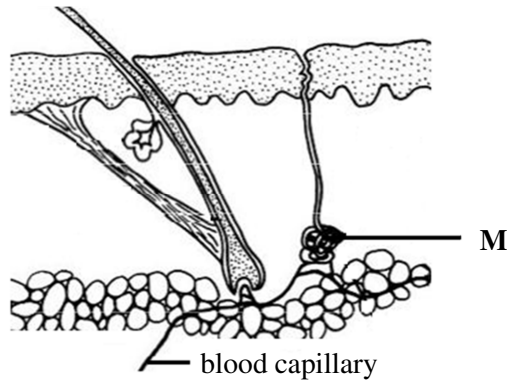
Weaker responses failed to write specific similarities between photosynthesis and respiration. They gave generalised points e.g. both occur in living organisms/ both take place in plants/ both are chemical processes/ both involve enzymes/ both are necessary processes/ in both processes glucose is present/ both are concerned with food. Candidates are advised to write relevant points while writing similarities as generalised points do not carry any marks. Examples of vague responses included: both processes form energy/ both inhale oxygen and exhale carbon dioxide/ in both processes nose is responsible/ the main by-product in both processes is carbon dioxide/ in both processes oxygen is utilised/ both take place in day time/ in both processes energy is released/ both processes occur irrespective to seasonal changes/ both are characteristics of multicellular organisms.

Example:

- ① Both are the chemical process
- ② They both formed energy (for the body)

Question 1b

The diagram shows a section of the human skin.



Briefly describe the role of the labelled structure **M** in keeping the body temperature constant.

Better responses gave correct description about the role of sweat gland in keeping the body temperature constant, i.e. sweat glands produce sweat which mainly contains excess water with dissolved salts. The sweat evaporates excess water and salts using body heat and thus keeps it cool.

Example:

Structure M is the sweat gland which produces sweat and the heat from the body is removed through evaporation which leaves a cooling effect. The removal of excess heat from the body keeps the body temperature constant.

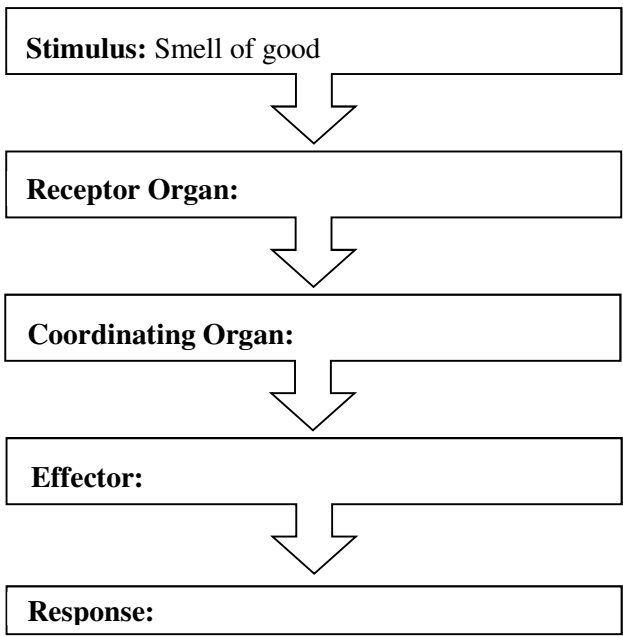
Weaker responses identified structure **M** as blood vessel and related it with the constant regulation of blood in the body to maintain temperature. Other weaker responses identified structure **M** as hair erector muscles and wrote about goose bumps. Some of the responses only identified structure **M** as sweat gland; such responses did not score any mark because the question demanded the candidates to describe the role of structure **M**. Examples of other vague responses included: it makes the human skin smooth/ it is a fat cell and provides insulation/ it regulates blood pressure in the skin.

Example:

The structure **M** shows the blood vessels, and blood vessels play a vital role keeping the body temperature constant by regulating blood in the body. While regulating the blood, blood vessels expand and contract and by expansion and contraction they keep the temperature of body constant.

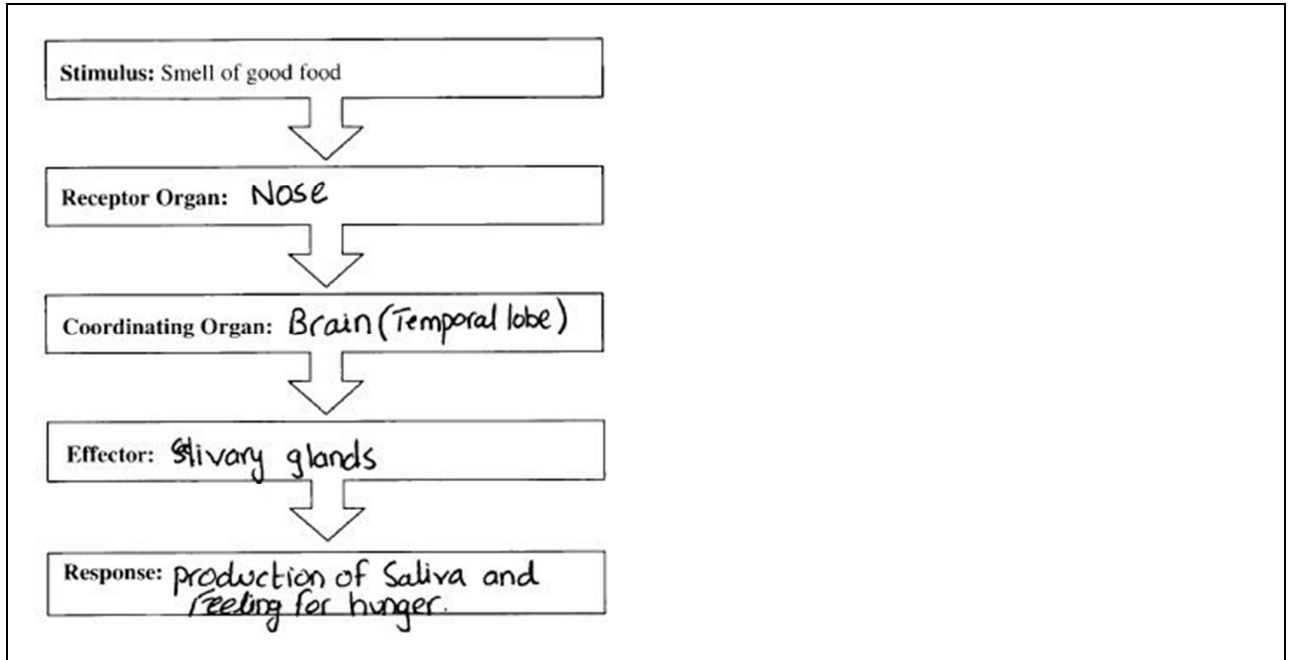
Question 2

Complete the given flow chart with reference to the structures involved in the given example of nervous coordination.



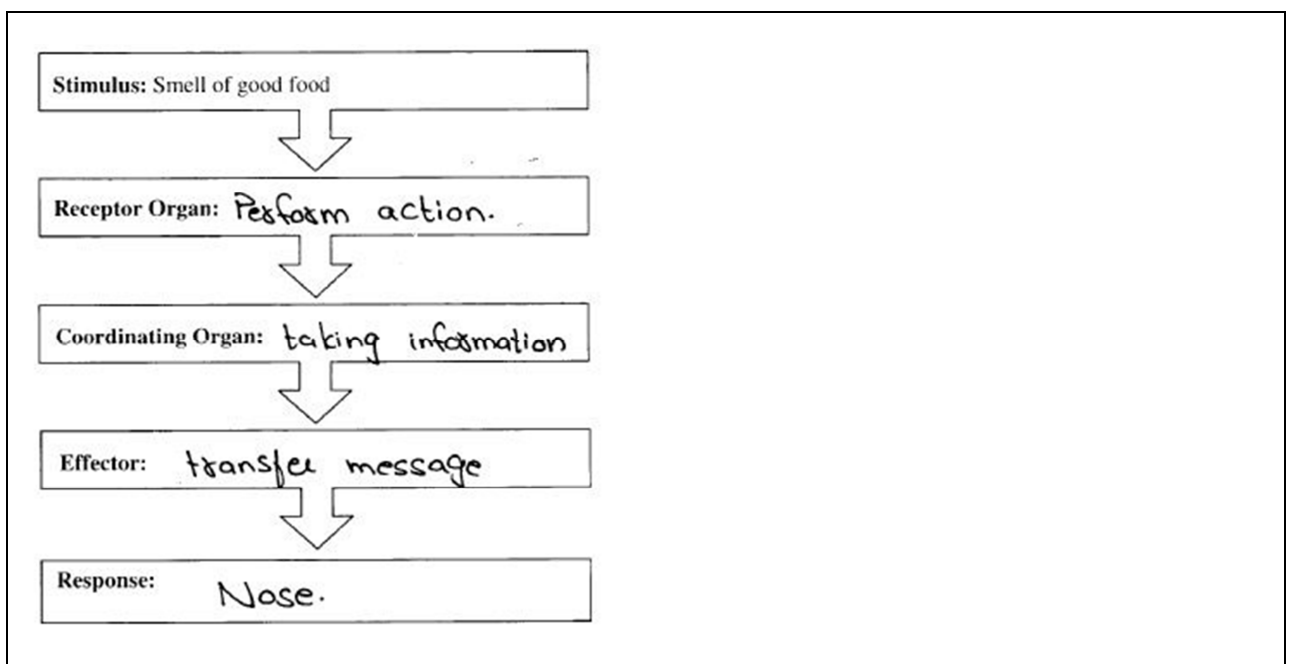
Better responses understood the stimulus clearly and named correct organ/ muscles/ glands, e.g. nose, brain/ spinal cord, salivary glands/ bicep muscles and production of saliva/ pick up the food/ walk towards the food/ eat the food.

Example:



Weaker responses described the role of each structure of the nervous coordination. For example, receptor organ: it checks the smell and sent it to coordinator, coordination organ: it sends message to effector. Others wrote irrelevant answers like coordination organ: understanding while effector: information. Responses writing hands or feet in effector were not given marks because instead of organ these responses should have written biceps/ hand muscles or thigh muscles.

Example:



Question 3a

Briefly describe the working of ball and socket joints.

Better responses displayed correct understanding of the word 'working' and described it as the ball-shaped surface of one rounded bone fits into the cup-like depression of another bone allowing movement in all directions/ allowing movement forwards, backwards and sideways/ allowing 360° movement.

Example:

In Ball and Socket joint one joint acts as a socket while the other joint fits into the socket like a ball, due to which it allows movements in every direction. i.e. Ball and socket joints can in each direction e.g. Shoulder joints.

Weaker responses failed to understand the meaning of the term 'working' in the question. The term working expected candidates to describe how do ball and socket joints work instead of merely giving the function of ball and socket joints. Such responses lost one mark. Other weaker responses only stated the examples of ball and socket joints in the body which was not the demand of the question. Examples of vague and incorrect responses included: it works in back and forth position/ it works good on body and help maintain body shape/ it is a connective tissue/ it allows slight movement/ which allow muscles to contract and relax/ maintain blood and calcium of the bones/ ball is immovable while the socket is moveable.

Example:

Ball Joints:- Ball and Joints are the types of Joints which allow the muscles to contract and relax.
Socket Joints:- Socket Joints are the types of Joints which are responsible for movement of the Joints.

Question 3b

Name the type of connective tissue present in the human body to join:

Muscles to bones

Bones to bones

Better responses correctly identified both types of connective tissue as tendons and ligaments respectively.

Example:

Muscles to bones Tendons

Bones to bones Ligaments

Weaker responses either swapped tendon with ligament or gave vague identification of the structure. For example, cartilage/ hard connective tissue/ skull bones/ leg bones/ epidermal connective tissue/ skeletal tissue/ hyaline cartilage/ fibrous cartilage/ filament/ joints/ vertebral column/ arm joint/ nervous tissue/ biceps/ radius/ spongy tissue/ bone marrow.

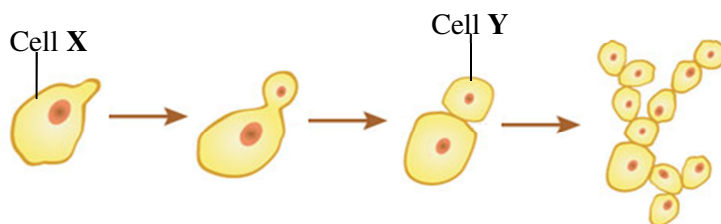
Example:

Muscles to bones Ligaments

Bones to bones Tendons

Question 4a

The diagram below shows a type of reproduction in an organism.



Is cell Y genetically different from cell X? Give ONE reason to support your answer.

Better responses stated that cell Y is not genetically different from cell X and supported it with correct reasons such as it is a bud emerged out from the parent cell/ it is budding/ it is resulted from a single parent/ asexual reproduction/ single nucleus is divided into two nuclei.

Example:

NO, the cell Y has the same genetic makeup as cell X because it is an asexual type of reproduction so there is no fertilization and variation.

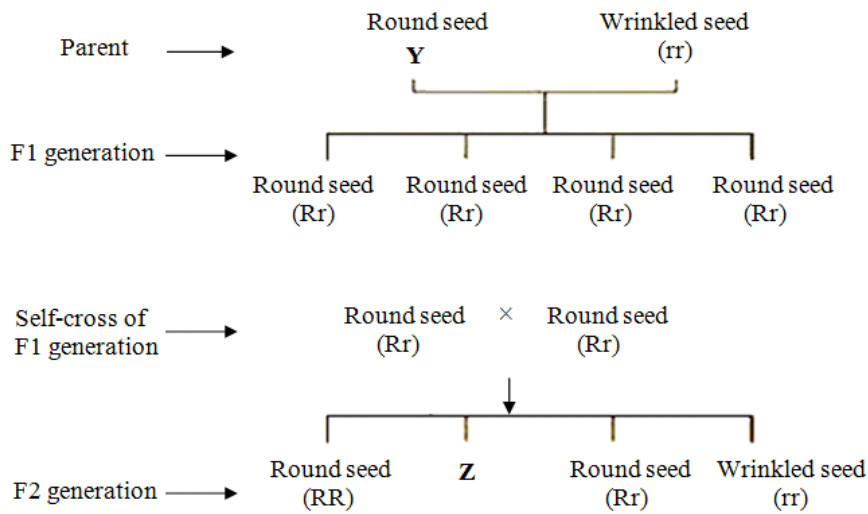
Weaker responses stated that cell Y is genetically different from cell X because cell X is a complete cell with its complete nucleus but cell Y nucleus is divided/ cell Y is having one daughter cell/ it is by the changes in the gene of the cell/ there is crossing over/ mutation occur/ cell Y is not having a mature nucleus/ environment also effects in the generation/ cell Y has two nucleus/ this is discontinuous variation/ generation of cell Y is faster than cell X/ DNA was not copied well on its replication. Such responses identified the process as binary fission/ fragmentation. Another mistake that was observed in weaker responses is the repetition of ideas. Other weaker responses wrote that cell Y is not genetically different from cell X because these are same. These responses failed to score full marks.

Example:

The above reproduction is bud formation. In the above reproduction a bud is formed on cell Y and the bud (small out growth) encloses one nucleus. Thus, cell Y contains a small out growth i.e. bud and cell X doesn't, that's why cell Y differs from cell X.

Question 4b

The flow chart below shows the results of the crosses between different seeds of a plant species.



Find out the missing genotypes Y and Z in the given case.

Genotype Y:

Genotype Z:

Better responses found out correct genotypes **Y** and **Z** as RR and Rr respectively.

Example:

Genotype Y: RR

Genotype Z: Rr

Weaker responses failed to understand the stimulus or the meaning of genotype. These responses either gave wrong genotypes or right phenotypes. The questions demanded candidates to find out the missing genotypes, hence, candidates writing correct phenotypes did not score any marks. Examples of incorrect responses included: 100% homozygous/ 75% homozygous and 25% heterozygous/ 50% homozygous and 50% heterozygous/ genotype **Y** is Rr or rr whereas genotype **Z** is RR or rr/ round seed/ allele R is missing/ wrinkled seed/ heterozygous.

Example:

Genotype Y: 100% homozygous

Genotype Z: 50% homozygous and 50% heterozygous

Question 5a

Why is the flow of energy considered as non-cyclic in an ecosystem?

Better responses described correctly the irreversible flow of energy as when moving from one trophic level to another; most of the energy is lost in the environment as heat which cannot be used again.

Example:

The flow of energy^{is} considered as non-cyclic in an ecosystem because the energy liberated by a system cannot be again use by the body. E.G: Once heat energy is released, it can't be reuse again.

Weaker responses failed to understand the term non-cyclic in the question. They failed to describe the fate of heat energy in the environment, i.e. lost and thus cannot be reused. Weaker responses wrote that if the energy is flowed from a plant to a rabbit so the rabbit will consume that energy. Here, consumption of energy by the rabbit is not an example of non-cyclic unless indicated that the rabbit will lose energy during respiration and excretion which cannot be regained. Other weaker responses wrote that it is non-cyclic because energy comes from outside and energy pools do not occur on earth/ it ends up after the decomposition/ it is just for producers, primary consumers most of the animals or humans are not involved/ it can never be destroyed/ it changes into fossil fuels/ it is not in sequence, it is spread all around the ecosystem. Few of the responses described the meaning of non-cyclic.

Example:

Ans) the flow of energy considered as a non-cyclic in an ecosystem b/c it can be recycle. like in other they recycle but ~~is~~ it cannot recycle that's why it includes in non-cyclic.

Question 5b

Briefly describe the process through which nitrogen is returned to the atmosphere.
(Hint: Refer to the nitrogen cycle)

Better responses described the process of denitrification for the return of nitrogen back to the atmosphere. They wrote that by the action of denitrifying bacteria, nitrates and nitrites are reduced to nitrogen gas.

Example:

Denitrification is the process by which nitrogen is returned to atmosphere. This is done by denitrifying bacteria which converts nitrates and nitrite into nitrogen.

Weaker responses described the whole nitrogen cycle instead of focusing on the step of denitrification. Some of the responses described nitrogen fixation in plants while some wrote about nitrogen released by factories or acid rain. Examples of vague responses included: nitrogen is released in the atmosphere from decomposers in the form of gas/ through decay of bacteria and assimilation of animals/ through exhaled air/ by using fertilisers, pesticides or in the form of oxides of nitrate/ by burning fossil fuels.

Example:

Nitrogen is returned to the atmosphere by the help of nitrogen fixing bacteria. These bacteria convert the nitrites from the urea to the nitrates which are then used by the plants from their soil.

Question 6a

Briefly describe the process of fermentation by bacteria.

Most of the *better responses* wrote about the conversion of pyruvic acid into lactic acid. Very few responses wrote about absence of oxygen.

Example:

Bacteria (eg: Lactobacillus) is used in lactic acid fermentation. When added to the substrated they convert pyruvic acid into Lactic acid. For eg: the milk is fermented into yoghurt by just adding mass culture of bacteria (found in yoghurt).

Weaker responses described the process of fermentation as in this process carbon dioxide is removed/ fermentation by bacteria is yeast/ we give heat to bacteria to growth/ worm is cut into 8 to 9 pieces and that pieces form new worm/ firstly the cell wall is made and second the nucleus becomes divided/ preparing food with low cost and quickly/ a fermenter is used in the process/ bacteria dissolves in the form of farming/ incomplete oxidation-reduction of glucose/ growth of bacteria is very rapid and product is in large amount. Most of the weaker responses described the steps of conversion of milk into yogurt.

Example:

In fermentation by bacteria is done to convert milk into yoghurt. A bacteria is added to warm ~~heat~~ milk and the protein in milk will coagulate and form yoghurt.

Question 6b

Given below is a set of drugs.

Mescaline Aspirin Diazepam Psilocin

Identify hallucinogens and sedatives from them.

Hallucinogen	Sedative

Better responses categorised mescaline and psilocin as hallucinogens whereas diazepam as a sedative.

Example:

Hallucinogen	Sedative
Psilocin	Diazepam
Mescaline	

Weaker responses categorised diazepam as a hallucinogen whereas psilocin and mescaline as sedatives.

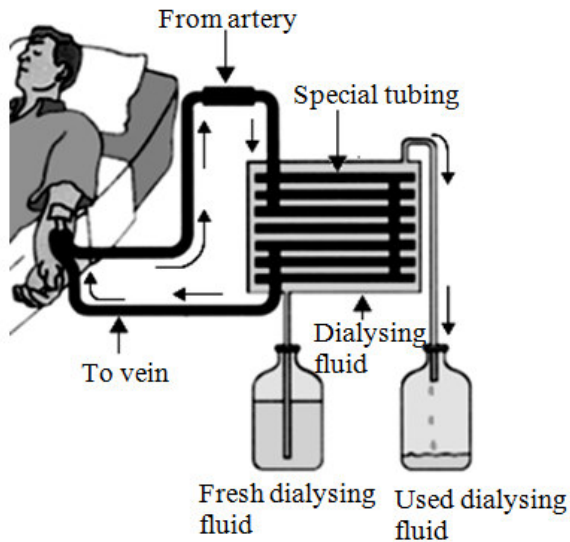
Example:

Hallucinogen	Sedative
Diazepam	Aspirin
	Psilocin
	Mescaline

Extended Response Questions (ERQs)

The following questions offered a choice between part **a** and **b**.

Question 7a



- Name the type of dialysis shown in the diagram.
- Dialysis machine is considered to be an artificial kidney. Describe the features of a dialysis machine on the basis of which it can substitute the functions of different parts of the nephron.

Better responses identified the given type of dialysis as haemodialysis. These responses related the working of different parts of a dialysis machine with each part of the nephron to justify the given statement that the dialysis machine is considered to be an artificial kidney. The description in these responses included: the walls of the tubing are partially permeable. This allows small molecules, like urea and other waste products, to diffuse out of the tubing. Blood cells and large proteins cannot pass through the tubing. The function is like glomerulus and loop of Henle. The dialyzing fluid consists of essential salts of the correct composition. This allows selective reabsorption like loop of Henle and removal of excess salts. The dialyzing fluid does not contain any urea/ uric acid so that it is completely removed from blood like the overall function of nephron. The tubing is long and narrow like loop of Henle to allow maximum reabsorption.

Example:

i) The above diagram is showing the ~~haemodialysis~~ haemodialysis. This is a type of dialysis in which ~~dialysis fluid~~ ~~is~~ ~~pump~~ the human blood is pumped by an apparatus called dialyser. All the extra waste diffuses into the dialysis fluid and then cleaned blood is released back into the body.

ii) Dialysis fluid is considered to be an artificial kidney because it functions much like nephron. The semi permeable membrane is present in the dialysis machine which helps in the process of diffusion. The extra nitrogenous waste are removed by it and so like nephron. ~~neph~~ All the parts of nephron e.g Bowman's capsule, loop of henle etc works for the excretion of metabolic waste from body by urine formation thus it is known as ~~ex~~ excretory unit of kidney.

iii) The dialysis machine contain long, narrow, coiled ~~tub~~ tubings which increases the surface area to volume ratio and speed up rate of exchange. In nephron, the tube becomes coiled as well when it comes to distal convoluted tube in cortex.

iv) The dialysis ^{machine} contain equal numbers of glucose, amino acid and in the form of dialysis fluid so that it prevents to blood ~~to~~ safe from entering any of the glucose or amino acid in blood and this fluid further helps in cleaning of blood. same like nephron. when blood enters into kidney by renal artery it dividedes ~~it~~ into arterioles and enters into glomerulus but is forced out of glomerulus ~~ca~~ capillaries because of high pressure and concentration ^{of waste material} and enters in bowman's capsule and travel onwards until the blood is cleaned.

v) The loop of henle and collecting duct absorb water and D.C. ^{are} absorb sodium salt and in dialysis machine, ~~fluid~~ ~~also~~ All these ~~are~~ removed by dialysis fluid.

Weaker responses identified the type of dialysis as peritoneal, artificial dialysis. These responses gave a description of the events as shown in the diagram. For instance, blood comes out from artery, enters into special tubing, passes through dialysing fluid and goes back to body through vein. Here, the labels were given to direct candidates towards the distinguishing features of dialysis so that they can relate it to the function of different parts of the nephron. Most of the weaker responses gave a general description of the process and that it takes place twice in a week. Other weaker responses wrote that it helps patient to survive even when a kidney is failed/ it is a long size machine/ oxygenated blood is transported into the body by vein/ it is very expensive but protectful process/ we go to hospital for it because it cannot be done at homes/ it takes about 2-3 hours. The question is constructed on an understanding based SLO which demands candidates to understand the functioning of different parts of the dialysis machine. Unfortunately, most of the candidates rote memorised the process of dialysis and regurgitated it in the exam paper.

Example:

It is type of dialysis name -
the peritoneal dialysis which the simple process of dialysis.
In dialysis machine the blood is carry
from the body then it is pass from
the artery then it is send into the
tubing in which blood is cleaned with
the microorganism and such disease which all
involve in blood then the fluid which
un-used it down in the un-used fluid beaker
while the fresh fluid is mixed with blood
are it send back in the body through
the veins. It is also done in the
homes. The body which is suffering from
the kidney disease that patient's body is
applied to the dialysis which is the
last stage of kidney disease. dialysis is
help them to clean the blood of the
body because kidney is not do the function
of clean the blood. So the dialysis
machine is also considered as the artificial
kidney because dialysis machine do the
function of kidney.

Question 7b

Select ONE example each of nervous and chemical coordination from your daily life and describe them to highlight the significance of coordination in the body.

Better responses chose one example in each case, nervous and chemical, and described it with the coordination among two to three body organs and the way this coordination helps in the accomplishment of the task. Hence, these responses scored full marks.

Example:

Nervous coordination is brought about by nervous system, where as, chemical coordination is brought about by endocrine system.

~~As~~ ^{An} ~~an~~ example of nervous coordination is withdrawal of hands when touching a hot object. This type of coordination is brought about by spinal cord as it is a reflex action. Heat stimulates the pain receptors in our skin. As a result, a nerve impulse is generated which is carried by sensory neuron to the inter neuron in the spinal ^{cord}. Inter neuron transmits the nerve impulse through its axon to the cell body of motor neurons ^{inside the spinal cord}. Motor neurons carry this to the effectors i.e the muscles. As a result, muscle contracts and we remove our hand from the object. The nerve impulses are also transmitted to brain to make the person aware of pain and what happened. With the help of this co-ordination we are able to respond to such stimulus ^{and} ^{from injury} ^{at safe} ^{ourselves}.

~~The~~ Endocrine glands work through feedback mechanism. In this, the process is regulated by the output of the process. In negative feedback, the output of the process inhibits the rate of process. For example when our blood glucose concentration rises pancreas secrete insulin which causes the liver to convert excess glucose to glycogen. As a result, blood glucose level falls. The decrease of blood glucose level to a normal set point inhibits the production of insulin. Similarly, when blood glucose level falls, pancreas secrete glucagon. It causes the liver to convert glycogen to glucose and so blood glucose level rises. The rise in the blood glucose level to a normal set point inhibits the production of glucagon. So we can say that the output of the process i.e blood glucose level inhibits the secretion of insulin ^{and} glucagon.

Nervous coordination helped us to respond quickly ^{without} getting hurt and causing damage to our selves. where as, the chemical coordination helped us to maintain the level of glucose ⁱⁿ and blood and prevent ^{ourselves} from diseases such as diabetes ^{metitus}. Coordination is important as it helps in regulating processes and working together to generate responses and actions.

Weaker responses failed to understand the demand of the question. Some of the weaker responses described the differences between nervous and chemical coordination, e.g. nervous coordination is fast and has short-term effect whereas chemical coordination is slow and have long-term effect. One of the responses gave a detailed description about stimulus and ear as a receptor organ. Examples of other vague responses included: chemical coordination basically refers to the involuntary actions which are not under our control/ chemical coordination can treat many of the diseases in our body, it kill bacterial and viral diseases. Some responses described examples of nervous coordination as examples of chemical coordination, gave description about different parts of the brain or described structure and function of neurons.

Example:

Coordination mean coordinated the body organs like muscle, bones, etc. nervous and chemical coordination, when there is a reaction in our body some of few organs change their reaction and change the chemical which are found in our body due to eat medicines, and antibiotics. there is alot of significances of chemical coordination like it treat many of disease in our body- it kill bacterial and vidual disease. also kill germs in our body- nervous coordination mean which coordinates our nerve impulses. or nerves- which carry informations to body to brain, then our body or brain coordinated.

Question 8a

- i. How are hypogeal and epigeal germination different from each other?
- ii. State THREE ideal conditions which can help a seed to germinate successfully. Also describe the importance of each condition.

Better responses differentiated between both types of germination as, in hypogeal germination, the epicotyl elongates and forms the hook whereas cotyledons stay underground. In epigeal germination, the hypocotyl elongates and forms a hook, pulling the cotyledons above the ground.

These responses stated the conditions necessary for germination and described them using key words/ phrases such as, sufficient water is required to rupture seed coat/ activation of enzymes/ digestion of stored food. Adequate oxygen is required for respiration to generate energy. Optimum temperature between 25-30°C is required for maximum enzymatic activity/ to prevent enzyme denaturation.

Example:

Ans(i) In hypogeal germination, the epicotyl elongates and forms a hook, the seed remains underground. Example of hypogeal germination is maize, cotton. While in epigeal germination the hypocotyl elongates and forms a hook. The seed is pulled above the ground and the examples of epigeal germination is coconut etc.

(ii) Temperature: The optimum temperature for germination of seed ranges from 25°C to 30°C.

Oxygen: Oxygen is important for germination of seed as it allows the process of respiration.

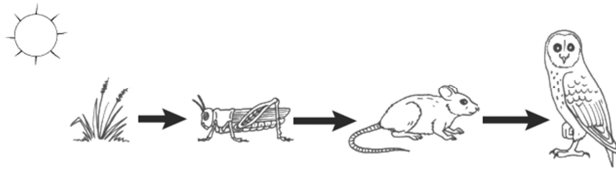
Water: Water is necessary for germination of plant because it helps in digestion of stored food and it also helps in growth of plant.

Weaker responses swapped the description of hypogeal with epigeal germination or gave wrong description such as: hypogeal germination does give the water properly and in epigeal were grown without water/ seed germinate in greater amount in hypogeal whereas seed germinates in less amount in epigeal. Moreover, these responses gave a very generalised description of role of water, oxygen and temperature. Most of the weaker responses described that water is necessary for all the living organisms/ giving water day and night is good for plant growth/ soil must be fertile and containing minerals necessary for plant growth/ without water embryo would dry up/ mostly seeds grow by sunlight/ fertilisers should be provided for fast growth/ protect seeds from insects. Responses stating air as a condition for germination were not awarded marks since air is a mixture of gases and not composed of oxygen only.

Example:

In epigeal germination seed is grown and shoot and germinate like a hook and the hook is pulled downward and in hypogeal germination the hook is pulled upward. There is must be suitable temperature, specific nutrients, minerals, fertile soil for a seed to germinate. There should be fertile soil, Temperature should be normal sufficient nutrients and a medium to grow. or to germinate. In Epigeal germination the hook is pulled and it get excessive energy from sun. Epigeal germination may be occur in cotyledons ^{seed} plants and hypogeal is dicotyledons.

Question 8b



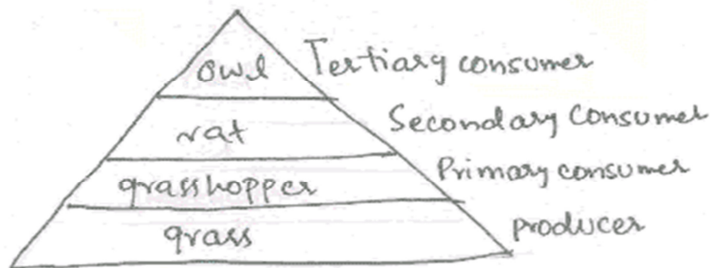
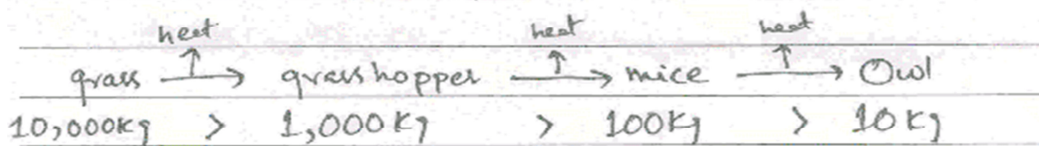
- i. Compare the flow of energy from grass to owl in the above food chain assuming that there is 10,000 KJ energy at the producer level.
- ii. Construct a pyramid of biomass of the given food chain.

Better responses described that grass/ producers to have highest amount of energy. They store this energy in their tissues and also transform it into mechanical and heat energy during their metabolic activities. This energy in producers flows to herbivores (primary consumers). Herbivores transform it into mechanical and heat energy during their metabolic activities and store the rest in their tissues. Carnivores (secondary consumers) eat herbivores and get energy. Secondary consumers will be eaten by tertiary consumers which would gain the least energy in the given food chain. Thus, in the given food chain, grass has the highest amount of energy and 90% of energy at each trophic level is lost before it reaches the next trophic level. Assuming that grass obtains 10,000KJ energy, it can be said that grasshopper would have 1000 KJ, rat would have 100 KJ and owl would have only 10 KJ of energy.

These responses also drew correct shape of the pyramid of biomass showing grass occupying the biggest volume, grasshopper/ rats occupying volume less than grass but more than owl and owl occupying the smallest volume.

Example:

Sun is the ultimate source of energy for all living organisms. Grass absorbs sun energy in the form of light rays and make organic food (glucose) by the process of photosynthesis and stores them in their tissue as in the form of energy. Assume that the energy at the producer level is 10,000 KJ. Grass hopper a primary consumer (herbivore) eats the grass and consume grass' energy in it's tissues. He lost 10% of energy in his mechanical work in the form of heat. Now the energy is 1,000 KJ. Mouse fed upon grass hopper and consume it's energy and store the energy in it's tissue. Mouse - a secondary consumer (primary carnivore) use this energy in it's mechanical work and energy is released into the environment in the form of heat and more 10% ^{energy} is lost. Now the energy remaining is 100 KJ. Owl a secondary carnivore and tertiary consumer prey ^{upon} mice and ~~consume~~ eat it. The energy stored in the tissue of mice is utilized by owls. Owls, during their mechanical work lost more 10% of energy in environment in the form of heat. Energy is stored in the tissues of owls. ~~There~~ now a energy remaining is 10 KJ. Thus at each trophic level after producer energy is decreased by 10% and lost in the environment in the form of heat during mechanical work. ~~Like~~ Likewise,



Weaker responses described the given food chain in detail as who eats who. Examples of vague responses included: the biomass will increase after producer because when primary consumer eats producer so primary consumer's energy will boost/ an owl is the forest animal which require greenery coming from grass, the grass contains green pigments which helps the owl to respire/ in grass flow of energy is constant. Moreover, these responses drew food chains or food webs instead of pyramid of biomass or drew a correct shape of the pyramid but labelled in reversed order, i.e. starting with owl at the bottom.

Example:

Flow of energy from grass to owl in the above food chain assuming that is the form of a non-cyclic flow of energy in which the grass is eaten by grasshopper and grasshopper is eaten by snake and snake is eaten by owl then owl is eaten by the other organism in which is the last they decomposes in the soil and the decomposed organism mixed with soil and soil is become with the plants this soil is used in the plants and plant used the flow of energy to make the food as producers and consumers get the energy to depend upon the producers and if consumer decomposed then decomposers get the energy to decomposed the consumer completely into soil. That three things assuming the flow of energy at producer level. Producers get energy from sun to make food. Consumer gets energy from producers to eat food. Decomposer gets the energy from consumer to decompose it on the soil.

Pyramid of biomass of the given food chain.