

WHAT MAKE LEARNERS FAIL BIOLOGY SCENARIO BASED ITEMS.

- **Wastage of time** presenting what is not required as guided/instructed in the task that end up not part of the intended assessed competences.
- Connecting information provided in the scenario to cultural/traditional/religious/tribal explanations **instead of biological/scientific facts/concepts**, and therefore unable to apply biological responses to the task presented.
- **Failure to read and interpret all the key words** in the scenario and task. Therefore, learners respond to only part of the events/information in the task and thus **denied highest scores** for the specific item.

DON'T WORRY, DO THIS;

- **Read the entire scenario, support and the task, Underline the key words using a pencil while you read again.**
- **Summarize the scenario in your own biological understanding.**
- **Determine all the subtopics/topics needed to be included in your response. This will help you know how much content to write.**
- **Restate statements/phrases in the scenario using your own words, use a simple paragraph frame work and create your**

outline. Find evidence (some may be hidden in the scenario) to be used in your response. Explain why the evidence supports your answer/response.

- Use details from the text to explain the key biological points you listed in your outline.
- Review your response making sure that it responds to all parts in the scenario and the task. Re-read the scenario again and also read your response to find if it makes sense to the task.

THE STRUCTURE OF END OF CYCLE ASSESSMENT BIOLOGY THEORY

- The paper comprises of two sections, that is section A and section B, thus paper one is comprised of a total of 7 items. Section A is comprised of three items, all compulsory, and section B comprises of four items which are grouped into two parts: part I and part II. Both parts have two items and the test taker/item taker/candidate is required to attempt only one item from each part.
- Section A items require short but constructive responses to the structured type of task from the scenario. The tasks may be divided into two, three or even more, but assessing knowledge,

understanding and applications of knowledge in the respective tasks.

- Section B items require open essay type responses to single/block task. It also assesses knowledge, understanding and application of knowledge.

The paper consists of scenario based items divided into three parts:

-) **Biological scenario:** This contains text describing biological concept(s), results of experiment or other scientific research about circumstances taking place in the society. It triggers an item taker to biologically think about biological responses rooted in the syllabus learning outcomes.
-) **Support material:** This can be in terms of pictures, drawings, charts and or tables. A support material enables an item taker to understand more of the biological scenario. It is not necessary if the biological scenario is clearly written and understandable by an item taker/candidate.
-) **Task:** Tasks are indirect instructions which demand learners to construct responses based on the scenario given and so, responses must not deviate from the scenario as well as the task. An item taker is required to bring together and apply scientific knowledge and understanding from different areas of the subject syllabus.

SECTION A

Items set in this section require short and right on point responses.

ITEMS AND ELEMENTS OF CONSTRUCT**ELEMENT OF CONSTRUCT 2- PLANT BIOLOGY (for item 1 or 2 or 3)**

Understand how plants obtain and use nutrients to meet their requirements, during which raw materials and products are carried to and from various organs involved.

CONTENTS OR CHAPTERS EXAMINED

- General plant cells and specialized plant cells.
- Plant structures: roots, stems, leaves, flowers, fruits, seeds, etc.
- Plant viruses; cassava mosaic.
- Nutrition in plants and mineral nutrients.
- Gaseous exchange and respiration occur in plants.
- Osmosis, diffusion, and active transport.
- Absorption of water and mineral salts.
- Transpiration.
- Translocation of manufactured food through phloem and water through the xylem.
- Growth and development in plants (Germination and secondary growth).
- Sexual and asexual reproduction in plants.

Likely tasks/Bases of evaluation

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Bases of assessment	Criterion/ what to know
Organs, structures, and processes involved. Note: You must identify the structure or processes involved according to the scenario.	<i>Plant organs and structures: roots, leaves, fruits, stems, buds, flowers, and seeds.</i> <i>Processes that may be affected in plants; Photosynthesis, gaseous exchange, respiration, absorption of water, translocation of food in phloem, germination, ascent of water in xylem, transpiration, pollination, fertilization and dispersal.</i>
Roles/ functions of the structure or processes in plants.	<i>Know the simple functions and roles of plant structures like; leaves, flowers, roots, and stems, as well as the functions of processes like photosynthesis, transpiration, absorption of salts, etc.</i>
Identify the challenges the plants faced.	<i>Identify all the challenges the plants face as a result of a process or structure being stopped or destroyed.</i>
How plants overcome challenges	<i>State and clearly explain how plants overcome challenges like destruction of body parts, drought, flooding, fire, lack of light, etc. Possibly by seed dormancy, hydrolysis of stored food, minimizing transpiration in different ways, etc.</i>

HOW TO AWARD SCORES TO THE RESPONSES.

Basis	Highest level of performance	Scores
Organs/ structures/ processes.	<i>Identifies at least 3 plant organs/structures/processes involved</i>	03 (a)
Challenges faced by plants in the context or scenario	<i>Identifies at least 3 challenges faced by plants in the scenario</i>	03 (b)
	<i>Explains roles/functions of at least 3 organs/processes/structures involved.</i>	03 (c)
How plants overcome the challenge/ problem/ deficiency.	<i>States at least 3 solutions/adaptations/adjustments involved by plants to overcome the challenges.</i>	03 (d)
	<i>Explains at least 3 solutions/adaptations/adjustments involved by plants in overcoming the challenges.</i>	03 (e)

Item 1 (worked example)

Most of the herbalists in Uganda use Budongo forest as a source of their herbal medicines. They remove barks of the trees, harvest leaves and dig out roots in order to extract their herbal medicines which have helped Ugandans so much. However, trees have started decreasing greatly.

Task:

- a) Identify the plant structures that have been affected by the herbalists. (03 scores)

Leaves. ✓^a

Roots. ✓^a

Stems. ✓^a

- b) How do the actions of the herbalists affect the processes in plants? (06 scores)

When leaves are removed, the trees fail to carryout photosynthesis, ✓^b hence cannot manufacture food. ✓^c

Removal of tree barks destroys the phloem tissues ✓^b which prevents translocation of manufactured food from the leaves to the storage sites. ✓^c

Debarking also exposes the xylem tissues hence drying of the stem. ✓^b This affects the ascent of water and mineral salts from roots to aerial parts of the plant. ✓^c

Digging out the roots destroys them, ✓^b affecting the process of absorption of water and mineral salts by the trees. ✓^c This may lead to wilting/drying of the plants. ✓^c

- c) Explain how the medicinal plant trees are able to survive despite the actions of herbalists. (06 scores)

The trees have buds at nodes and internodes ✓^d that sprout into new leaves and stem structures. ✓^e

The trees undergo mitotic cell division at the phloem and xylem tissues ✓^d to replace the removed structures. ✓^e

Some trees develop more roots ✓^d to replace those removed hence survival. ✓^e

The remaining tree roots develop numerous root hairs ✓^d for extra support and absorption. ✓^e

Item 2

Mr. Kintu's cassava garden was invaded by the neighbour's goats at the time of tuber formation. The owner of the goats has refused to compensate Mr. Kintu and Mr. Kintu claims that his

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**ELEMENT OF CONSTRUCT 4-HUMAN PHYSIOLOGY (for item 1
or 2 or 3)**

Understands how the human body coordinates various activities and adjusts to ensure normal functioning.

The topics include;

- Coordination.
- Locomotion.

TYPES OF SCENARIOS AND TASKS;

The items focus on the basics of nervous and hormonal coordination in relation to locomotion.

Learners must know the neurons and pathways of impulses, the workings of the sense organs, hormonal disorders and the functions of different hormones.

More scores and attention are put on defects, disorders, drug abuse, and addiction. They may be less biological, more of CRE, or social or common knowledge, but alcoholism, marijuana, eye defects, etc. must be clearly mastered.

Likely tasks/ Bases of assessment

Bases	Criterion and guidelines
Structures/ processes Involved	<i>Identify all the structures involved; this may be receptor organs, effectors, motor and sensory neurons. And processes such as reflex arc,</i>

	<i>hearing, accommodation, actions of muscles and hormones.</i>
Roles of the structures involved	<i>Clearly, know the roles of structures involved in coordination in the human body: receptors, effectors, and different neurons. • Description and explanation of the roles of structure or process involved.</i>
Defects/ Disorders/ diseases/ drug abuse etc.	<i>This part affects individuals and society directly; you must know the signs, symptoms, and causes of the disorders. Strategies to avoid (prevention is better than cure), manage disorders, or solve problems.</i>

HOW TO AWARD SCORES TO RESPONSES

Basis	Highest level of performance	Scores
Description/explanation of concept/process/disorder/problem.	<i>Mentions at least 3 organs/processes/structures involved.</i>	03 (a)
	<i>Explains roles of at least 3 organs/processes/structures involved.</i>	03 (b)
Causes/symptoms/effects of the problem/disorder/drug abuse in the context/scenario.	<i>Identifies at least 3 causes/symptoms/effects of the problems/disorders in context.</i>	03 (c)
Solutions/strategies to manage/avoid the disorder/drug	<i>Identifies at least 5 solutions/strategies to manage/avoid the</i>	03 (d)

abuse/challenge or problem in the context/scenario.	disorder/challenge. <i>Explains at least 5 solutions/strategies to manage/avoid the disorder/problem.</i>	03 (e)
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Item 1 (worked example)

Marry a 60 year old woman has a neck swelling, frequent back pain and poor vision. Doctors further revealed that she has porous bones in her back bone and age-related long sightedness. Her family members may manage the condition through diet on addition to other measures the doctors gave them.

Task:

- a) Explain the cause for the Mary's health condition and the effect on normal body functioning. (06 scores)

Goitre, due to deficiency of iodine in the diet affecting thyroid hormone hence thyroid gland ✓^a expands to respond towards decreased amounts of iodine in the body.
✓^b

Osteoporosis, due to reduced oestrogen hormone after menopause leads to loss of calcium from bones, ✓^a making them weak and soft. ✓^b

Long sightedness, due to short eyeball/thin lens/taut suspensory ligaments ✓^a focusing light rays from a near object behind the retina ✓^b or so that only light rays from a far object is focused onto the retina. ✓^b

- b) Identify the challenges affecting Mary's health.
(03 scores)

Osteoporosis. ✓^c

Goitre. ✓^c

Inability to see near objects clearly. ✓^c

- c) Suggest how a suitable diet, sight defect correction and other possible strategies would manage her condition.
(06 scores)

Goiter: supplement iodine in the diet, such as iodised salt ✓^d to reverse the enlarged thyroid gland. ✓^e

Osteoporosis: diet rich in calcium and vitamin D ✓^c to increase bone strength. ✓^e

Long sightedness: use of converging lens ✓^d to converge light rays from an object onto the retina. ✓^e

Accept other correct responses. Diagrams for sight defect correction may also be included.

Item 2

Salaama, a student of Atam high school loves taking milk in the morning before she leaves for school. One day, she was cooking milk and it started to over flow as it boils. Salaama rushed to lift the saucepan but she immediately released it, slipped off and fractured her leg. When she was rushed to hospital, she was feeling back pain. The orthopedic doctor diagnosed her with osteoporosis.

Task:

Describe the events that took place in salaama's body from the time she touched the saucepan to the time she released it.

ELEMENT OF CONSTRUCT 5-INHERITANCE AND VARIATION (for item 1 or 2 or 3)

Appreciate how characteristics are transmitted in living organisms through reproduction and manifested as organisms grow.

The topics include:

- Genetics (genetic crosses and genetic disorders).
- Growth and development in man (mitosis).
- Asexual reproduction in plants.
- Meiosis, variation, inheritance, selection, and evolution.
- Reproduction in humans (antenatal care, postnatal care, breast feeding, teenage pregnancy, family planning, infertility, HIV/AIDS, and other STDs/STIs, copulation, fertilization, implantation, etc.)

NOTE: The scenarios and tasks with expected responses focus on:

- *Structures, with their roles being well explained.*
- *Identification of causes and symptoms of disorders or diseases.*
- *Strategies to manage a disorder or solve the challenge.*
- *Full explanation of the strategies to manage the disorder or challenge.*

HOW TO AWARD SCORES TO RESPONSES

Basis	Highest level of performance	Scores
Description/ explanation of the concept/process/ disorder/problem.	<i>Mentions at least 3 organs/processes/structures involved.</i>	03 (a)
	<i>Explains at least 3 roles of organs/processes/structures involved.</i>	03 (b)
Causes/symptoms/ effects of the problems/disorders/ problems	<i>Identifies at least 3 causes/symptoms/effects of the problems/disorders in the context/scenario.</i>	03 (c)
Strategies to manage/ avoid the disorder/ Challenge/problem.	<i>Identifies at least 5 solutions/strategies to manage/avoid the disorder/challenge/problem</i>	03 (d)
	<i>Explains at least 5 solutions/strategies to manage/avoid disorder/challenge/problem.</i>	03 (e)

Item 1 (worked example)

After John and Marry gotten married, they gave birth to a baby who was an albino yet the two, have normal skin colour.



The family relatives to John have rejected the baby claiming that Marry could have conceived from another man who is probably an albino. The family suspects so because the first born to the couple had normal skin colour. The baby has been further neglected and denied proper baby care.

Task:

- a) Show your working to explain to the family relatives, the father of the child. (06 scores)

Let A represent allele for normal skin colour. ✓^a

Let a represent allele for albino. ✓^a

Both parents could be heterozygous.

Parental phenotype: Normal man X Normal woman ✓.

Parental genotype:

Aa

\times

Aa ✓

Meiosis:

Gamete:

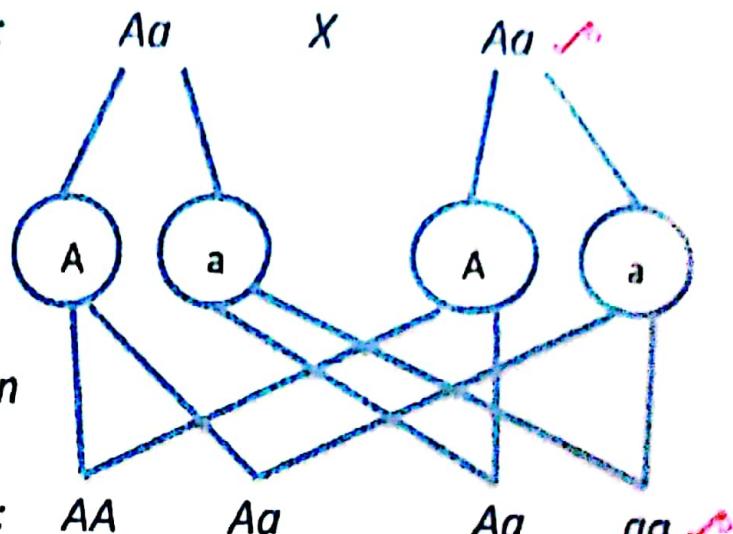
Random fertilization

Offspring genotype: AA

Aa

Aa

aa ✓



Offspring phenotype: 1 normal, 2 carriers, 1 albino

There is $\frac{1}{4}$ chance of producing an albino child hence the baby inherited gene that causes albinism from the parents. ✓

John and Marry have normal skin colour because they are carriers for allele that causes albinism and therefore, John is the father of the child. ✓

- b) Identify the likely effects of this trait to the baby and negligence of the baby care to his health. (03 scores)

Impaired vision. ✓

Skin damage by ultraviolet rays. ✓

Stigmatization. ✓^c

Discrimination by society. ✓^d

Poor hygiene and neglecting vaccinations can increase the risk of infections and diseases. ✓^e

- c) Suggest possible solutions on how to manage the child's health. (06 scores)

Provide sunglasses to the child ✓^d so as to provide protection against UV light. ✓^e

Take the child for annual eye and skin examinations ✓^d to catch any problem that may arise earlier. ✓^e

Use protective eyewear like glasses or goggles ✓^d to prevent eye injuries. ✓^e

Genetic counseling ✓^d to understand the type of albinism and potential health risks. ✓^e

SECTION B**WRITING AN EXTENDED ESSAY FOR PART 1 RESPONSES**

- In biology, don't introduce yourself, your school, tribe, religion, etc. Don't even greet the examiner. No scores for them.
- The essay must have the identified challenges, an explanation of the challenges, the resources affected, the benefits of the natural resources, and a solution to the problems.
- Don't waste time giving too many points in one area only. Just explain the problem very well. Definition is not explanation.
- You are free to use paragraphs, including three bases of evaluation, or handle one challenge at a time.
- Remember, problems and challenges may not come out clearly in the scenario. We think critically to identify the possible challenges.
- Advice and solutions can be mentioned last, but challenges must be mentioned and explained first.

PART 1.**BIOLOGY OF THE ENVIRONMENT, ELEMENT OF CONSTRUCT 1.**

Appreciates the diversity of living things and the sustainability of natural resources.

Topics;

- Introduction to Biology in s.1
- Classification and the five kingdoms
- Viruses: Ebola, influenza, COVID-19, except cassava mosaic, and HIV.
- Soil, especially the fertility, exhaustion, and pollution.
- Insects with economic and ecological roles.
- Ecology, interrelationships, chains, and webs.
- Man and the natural environment; natural resources and pollution

Types of scenarios, tasks, and responses for Part 1, Section B

- This part focuses on conservation biology. Candidates are assessed on the biology of the ecosystem in relation to conservation and sustainable use of natural resources.
- Likely scenarios are about forests, wetlands, and national parks.
- Give attention to pollution of the air, water, soil, etc.
- Know how human activities are connected to pollution and environmental challenges. Urbanization, road construction, industrialization, use of fertilizers, burning of charcoal, poaching, etc.

BASES OF ASSESSMENT WITH TIPS FOR MAXIMUM SCORING

Bases Problem/	Criteria and tips
	<ul style="list-style-type: none"> ➤ Identify the environmental challenges

challenge identification	<p><i>Caused by the actions or activities in the scenario.</i></p> <ul style="list-style-type: none"> ➤ <i>The challenges are normally hidden; don't just copy and paste a statement from the scenario.</i> ➤ <i>E.g., settling near forests in large numbers can cause deforestation, poor waste disposal, the spread of diseases, etc.</i>
Explanation of the problem/challenge.	<ul style="list-style-type: none"> ➤ <i>Explain all the problems and challenges identified.</i> ➤ <i>Remember, explanation is not definition.</i> ➤ <i>Explain deforestation as a challenge, not its definition.</i>
Identify natural resources being affected	<ul style="list-style-type: none"> ➤ <i>Mention all the natural resources being affected, both living and non-living. But start with, and write more of the living natural resources. E.g. Two living and one non-living.</i>
Conservation/Sustainability/Solution	<ul style="list-style-type: none"> ➤ <i>Suggest solutions or conservation measures to the different challenges identified.</i> ➤ <i>What is the solution to deforestation and the destruction of vegetation?</i> ➤ <i>Don't talk about a solution without stating the problem.</i> ➤ <i>What are the solutions to deforestation, Algal blooms, waterborne diseases, etc.?</i>
Benefits of Conservation/Values of conserving natural resources.	<ul style="list-style-type: none"> ➤ <i>Mention the benefits of the natural resources Or life forms conserved. Consider all the living natural resources first.</i> ➤ <i>Give biological answers first not geography and Entrepreneurship; e.g. tourists attraction, foreign exchange etc.</i>

HOW TO AWARD SCORES TO RESPONSES

Basis	Highest level of performance	Scores
Problem/ challenge identification from the context	<i>Identifies at least 3 problems/challenges in the scenario/context.</i>	03 (a)
	<i>Explains at least 3 problems/challenges in the scenario/context.</i>	03 (b)
Natural resources being affected.	<i>Mentions at least 3 natural resources being affected in the context.</i>	03 (c)
Conservation/ sustainability/ solution	<i>Suggests at least 5 solutions or conservation measures to the different challenges/problems identified in the context.</i>	03 (d)
Benefits of Conservation	<i>Mentions at least 5 benefits of natural resources or life forms conserved.</i>	03 (e)

Item 1 (worked example)

The Ugandan government gave a piece of land to a local investor to establish an industry.



Task:

Explain to the residents in the area how the environmental challenges came about and how to reduce on the effects of the challenges. Explain why the environment in this area should be conserved.

Loss of natural habitats ✓^a since trees ✓^c are cut down to provide space for industrial construction and settlement of the workers, causing wild animals ✓^c to attack human life. ✓^b

Loss of biodiversity ✓^a due to loss of forest which is the habitats for wild animals. ✓^b

Global warming ✓^a as trees are cut down for construction of industrial structures. This result into accumulation of carbon dioxide, a greenhouse gas that traps heat in the atmosphere hence increase in the temperature. ✓^b

Industries discharge their wastes into water body, ✓^a hot effluents increase the temperature of water ✓^c which kills aquatic organisms ✓^b such as fish. ✓^c

Settlement of workers of the industry may cause congestion ✓
leading to outbreak of diseases that affect life of man ✓

Solutions/remedies:

Treatment of industrial wastes before discharge in to water body. ✓

Planting trees that mature faster in the area. ✓

Relocating the industry to another area free from swamps and forest. ✓

Controlled disposal of human wastes from the industry workers and the community. ✓

Benefits of conserving the environment:

Trees reduce air pollution/global warming by absorbing carbon dioxide from the atmosphere. ✓

Trees release oxygen for aerobic respiration by animals. ✓

Water body provides water for domestic and industrial use. ✓

Water body is a habitat for aquatic animals like snakes, fish, frogs and crocodiles. ✓

Water body contains animals like fish which is food for man. ✓

Item 2

Many human activities that take place to meet human needs in Uganda can often be harmful to ecosystems. This affects several natural resources and hinders attainment of sustainability in Uganda as planned by 2030.

Task:

Discuss the negative impacts of the possible activities and suggest how Uganda would benefit if suitable practices are used in conserving the natural resources.

Item 3

In order to promote tourism in Murchison national park, the Uganda wild life authority decided to increase on the number of lions and these were transferred from Queen Elizabeth national park to the area. The lion population in Murchison falls national park grew bigger, and coincidentally the number of antelopes decreased drastically. With time, the park increasingly became busy and the game warden decided to use fire to control the

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bushes. During periods of burning, thick smoke covered the atmosphere for the greater part of the day. The national wild life body is now concern over the challenges in the national park.

Task:

Explain to the relevant authorities the origin of the problems in the Murchison falls national park, show how they can be worked upon and sensitize them on the relevancy of the natural interactions that go on in such communities.

Part II

ANIMAL BIOLOGY (ELEMENT OF CONSTRUCT 4)

Understand how animals obtain and use nutrients to meet their energy requirements, during which raw materials and products are transported to and from various organs involved.

Topics included;

- *Animal cells and specialized animal cells, except sperm cells and neurons.*

- Food nutrients and nutrition in man.
- Transport in animals; blood circulatory system; and lymphatic system.
- Excretion in humans.
- Respiration and gaseous exchange

KEY AREAS

Items focus on responses, which include many body organs, processes, and those that tackle societal issues. These may include:

- Feeding, respiration, gaseous exchange, respiratory waste product formation, and elimination of the waste.
- Sources of food nutrients, digestion, and deficiency diseases with their symptoms.
- Sources of nutrients and feeding requirements for children, physical workers, and mental workers like bankers, pregnant mothers, and elders.
- Feeding habit in relation to high blood pressure and heart diseases, with physical exercises as a solution.
- Sources of food nutrients, assimilation of the food nutrients, and diabetes and their causes and treatments.
- Calculation of body mass index and feeding disorders (Binge, Bulimia, and Anorexia Nervosa) with their symptoms and solutions, including body-shaping pills.
- Diseases and disorders with their causes, symptoms, management, treatment, and prevention must be mastered.

Examples include disorders and diseases of the circulatory system, respiratory system, and kidney.

BASES OF EVALUATION

Bases	Criterion and tips for maximum scores.
Organs/ structure/ Processes involved.	<ul style="list-style-type: none"> ➤ Mention organs/structures and the processes involved. ➤ Describe the processes, stating the location where they occur.
Explain the roles or functions of the processes involved.	<ul style="list-style-type: none"> ➤ Roles/functions of different structures/processes. Know the functions of body processes; Mastication, chemical digestion, absorption, blood circulation, respiration, gaseous exchange, deamination, excretion, etc
Identification of products of the activities from the organs/ processes involved.	<p><i>Identify the products of the activities in the structures/processes.</i></p> <p><i>Know the products of the above processes: the useful products and waste products, especially digestion, excess food nutrients, and respiration.</i></p>
Diseases/ deficiency/ disorders/ physiological challenges in the context.	<ul style="list-style-type: none"> ➤ Identify challenges/diseases/deficiency according to the scenario given. • Master the challenges posed by excess nutrients like glucose and amino acids. • Know deficiency diseases of food nutrients. ➤ Challenges caused by respiratory and Excretory wastes (lactic acid, excess heat, carbon dioxide, etc.)
How the	<p><i>Explain how human body/organs overcome</i></p>

Human body/ organs overcome the challenges.	<p><i>the challenges created by body activities/ behavior or diseases.</i></p> <ul style="list-style-type: none"> ➤ <i>Master how body challenges are overcome.</i> ➤ <i>Challenges caused by respiratory and Excretory wastes (lactic acid, excess heat, carbon dioxide, etc.).</i> <p><i>Read about the management of different diseases and disorders.</i></p>
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Note: *Organs, raw materials, processes, and products of the processes must come out clearly in your essay responses.*

Give basic biology without unnecessary descriptive details of a process because the response covers many topics. Write a little about all the structures and processes involved.

HOW TO AWARD SCORES TO RESPONSES

Basis	Highest level of performance	Scores
Description/ Explanation of the concept/process/ disorder/problem.	<i>Mentions at least 3 organs/structures/processes.</i>	03 (a)
	<i>Explains the roles of at least 3 organs/structures/processes.</i>	03 (b)
Diseases/problem/ deficiency/ disorders/ physiological	<i>Identifies at least 3 causes of the disorder/challenge/disease/deficiency according to the scenario given.</i>	03 (c)

challenge.		
Strategies to manage/ overcome / avoid the disorder/ disease/ challenge/ deficiency.	<i>Identifies at least 5 solutions/ strategies to manage/avoid the disorder/challenge/disease/ deficiency.</i>	03 (d)
	<i>Explains at least 5 solutions/ strategies to manage/avoid the disorder/challenge/disease/ deficiency.</i>	03 (e)

Item 1 (worked example)

Mariam's father, who has been smoking for the past 20 years, has discolored teeth. Recently, he started experiencing painful gums, shallow respirations and has signs of developing stroke. Mariam took her father to the hospital and doctor's examination presented in the table below;

Condition	Patient's value	Normal value
Breathing rate per minute	28	12-18
Heart beat rate per minute	140	60-100
Blood pressure (systolic pressure) (diastolic pressure)	<u>160mmHg</u> 98 mmHg	<u>(100-120)mmHg</u> (60-80) mmHg.

Task:

Identify the affected body organs and describe how the normal body function of the patient is affected. Explain possible measures to rescue his life to normal.

Smoke from tobacco contains nicotine, which changes the normal colour of teeth ✓^a and over time discoloured teeth may also be due to failure to brush teeth regularly. ✓^c this affects digestion of food by teeth ✓^a in the mouth. ✓^b

Painful gums are as a result of smoke and failure to brush regularly which promotes accumulation of plaque ✓^c allowing bacteria to survive hence affects gums ✓^a leading to gingivitis.

His breathing rate is above normal (shallow respiration) due to effect of tar and carbon dioxide, ✓^c this affects respiratory systems mainly lungs and alveolus ✓^a hence lowered efficiency of breathing. Smoking affects respiratory organs such as bronchi, alveoli ✓^a leading to diseases such as emphysema, lung cancer and bronchitis. Lungs ✓^a are unable to take in enough oxygen ✓^b thus increase in breathing rate to force more air with oxygen from the atmosphere.

Stroke among smokers develops due to increased blood pressure. ✓ Chemicals in tobacco cause narrowing of blood vessels ✓ thus blood flows ✓ with more pressure and therefore, little oxygen reaches the brain ✓ hence stroke following long period of smoking.

Prevention and treatment measures:

Brushing teeth regularly ✓ d to prevent discolouration and damage of gums. ✓

Do physical exercise ✓ d to avoid narrowing of blood vessels. ✓

Avoid smoking tobacco ✓ d to prevent the effects of chemicals in tobacco. ✓

Eat foods with vitamin C such as vegetables ✓ d to treat painful gums ✓

Item 2

In Karamoja district, children are victims of kwashiorkor, coronary heart disease and weak bones. This is due to poor diet