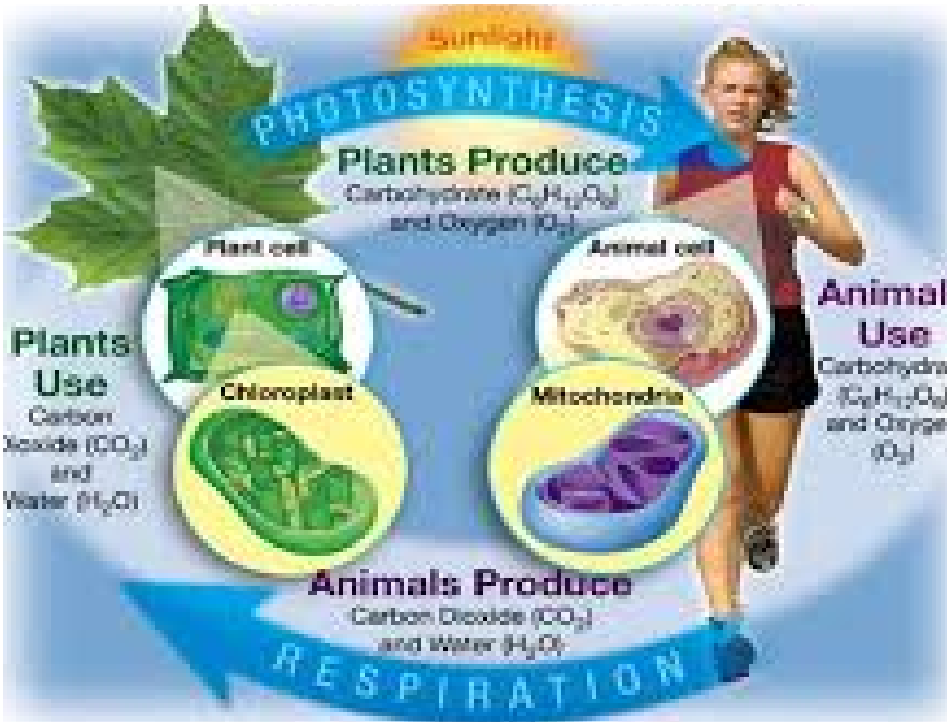
HOW TO PASS NEW CBC

BIOLOGY IN ONE DAY

2024



STUDENT'S NAME;.....

CLASS.....

SCHOOL.....

Pass without cramming

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TABLE OF CONTENTS;

Page

HOW TO PASS NEW CBC BIOLOGY IN ONE DAY
BY DANIEL KAGIRI SERIES 2024

Rationale;
This manual is enriched with easy to understand study skills for passing the new competency based curriculum biology. It covers wide areas of concern that prepare a new curriculum O'level candidate for end of cycle assessment.

Summary;
The manual covers a thorough breakdown of the following;

- ✔ Biology Paper structure; both paper 1 and paper 2
- ✔ Elements of construct in biology papers 1 and 2
- ✔ Topics, sub topics and content assessed in each element of construct
- ✔ Item approach for both paper 1 and 2
- ✔ Sample items in biology paper 1 and 2

👉 **FOOD FOR THOUGHT**; In the new competency based curriculum, a learner MUST have a lot of information i.e must read wide / research more.

Biology is set in EC -Elements of Construct (areas of examination) In paper 1 and 2

PAPER 1
- Has 5 elements of construct; EC 1, 2, 3, 4, and 5 across both sections A and B.

Section A
-Items set require short and right on point responses. Section A consists of three (3) elements of construct i.e EC 2, EC 4 and EC 5.

Element of Construct 2 (EC 2)
Plant science - plant cells, nutrition in plants, transport in plants, gaseous exchange and respiration in plants, movement in and out of a plant cell, germination reproduction in plants

HOW TO WRITE A GOOD ESSAY / APPROACH TO ITEMS FROM EC 2

-Plant structures and organs and processes
- description, explanation of plant processes e.g transpiration, translocation, germination, absorption, fertilisation, pollination, photosynthesis, respiration etc
- plant challenges, deficiencies, diseases and disorders e.g water stress, wilting, chlorosis
- how plants overcome challenges, e.g increasing mitotic division

Element of construct 4 (EC 4)

Coordination in man and locomotion in man - nerves, reflex arc, hormones (plant and animals), receptor organs, skeletons, bones, action of muscles, disorders.

HOW TO WRITE A GOOD ESSAY / APPROACH TO ITEMS FROM EC 4

- description, explanation of the structures e.g nerves, receptors; processes e.g reflex arc, hearing, accomodation, action of muscles and hormones
- identification of symptoms, causes, effects of the disorder, disease, challenge e.g hormonal imbalances, goitre, osteoporosis, diabetes , muscle cramps
- how to manage; either behavioural or physiological

Element of construct 5 (EC 5)
Reproduction in man, growth and development in animals, genetics, variation and selection

HOW TO WRITE A GOOD ESSAY / APPROACH TO ITEMS FROM EC 5
- description, explanation of the structures e.g vagina, organs e.g testicles, concepts e.g genetic crosses(these must be worded as much as possible), processes e.g corpulation, fertilisation, implantation, meiosis, mitosis,
- symptoms, causes, effects of disorders e.g hormonal imbalances, diseases e.g haemophilia; challenges e.g albinism
- how to manage, either behavioural or physiological e.g avoiding cold, going for medical treatment

Section B

It consists of two (2) parts i.e part 1 and 2

Part 1 contains two (2) items from EC 1 where a learner attempts only one (1)

Part 2 contains two (2) items from EC 3 where a learner attempts only one (1)

👉NB; All items require open essay responses and all items have 1 block task unlike in section A, where a single scenario can have one or more tasks

👉Stick on the scenario, it will direct you what to write as your responses to avoid writing irrelevant.

👉More of what is required is required is RELEVANT, but more of what is not required is IRRELEVANT

A BREAKDOWN OF SECTION B

It contains two (2) elements of construct/ areas of examination. I.e EC 1 and EC 3

Element of construct 1 (EC 1)

Diversity and sustainability of natural resources (ecosystem) - destruction of ecosystem by either natural factors or human influence

HOW TO WRITE A GOOD ESSAY / APPROACH TO ITEMS FROM EC 1

Organised in 3 stages i.e

STAGE 1 - Paragraphs indicating
- problem identified
- problem explained
- 3 examples of natural resources affected by the problem 2 must be living

STAGE 2 - paragraphs explaining
- conservation measures/solutions to problems identified

STAGE 3 - paragraphs explaining
- benefits of conservation ; introduce a breaker e.g start with "however, ...

👉**NB** - Never give less than 5 paragraphs
👉 - A good essay MUST not contain a candidate's name, religion, village, school, age, parent's job and names etc

Element of construct EC 3
Cells, Nutrition in Man, transport in Man, gaseous exchange and respiration and excretion

HOW TO WRITE A GOOD ESSAY / APPROACH TO ITEMS FROM EC 3
- Structure, organ and process involved
- description explanation or function of the above
- Identification of challenges, problems, disorders or deficiencies
- explanation of stragies to manage the above - only behavioural or physiological e.g going for medication, surgery, changing diet

👉**NB** focus - what enters the organ, what happens to it (process) and what is formed/ product/ what comes out

👉Logical flow important e.g start with mouth to stomach then to duodenum if digestion was asked
👉what food eaten, nutrient contained, it's digestion (site, enzyme and product), it's absorption and it's assimilation.
👉talk about one nutrient at a time

GENERAL APPROACH TO INTEGRATIONS

To avoid writing irrelevant and remain on track, the following two steps should be put into consideration whenever attempting an integration or a SBTI - Scenario based test item.

- ✔ **Identification of the problem;** > involving stating, describing and explaining the problem.
- ✔ **Solving the problem**; > involving stating, describing and explaining the solution(s).

However, another approach can be opted for, in substitute for the above approach. It is called the **5W's + H,** and these are questions a learner has to ask him/ herself after reading a scenario twice and before writing any responses from which a fine piece of responses can be obtained without writing the unnecessary information. In details, the **5W'S+ H,** stands for;

1) **What** > stating the problem
2) **Why** > cause of the problem
3) **Where** > site of occurrence of the problem
4) **When** > time of occurrence of the problem
5) **Who** > one affected by the problem
6) **How** > way forward/ solution (s)

Questions 3 and 4 (where and when) may be applicable in some areas and not all, commonly applied in areas involving physiology(body processes).

👌**NOTE**; All responses to the above questions should be detailed in terms of, stating, describing and explaining the response to each question hence a 3×3×3 score criteria which allows a learner to maximise scores from a given item.

SAMPLE PAPER ONE TEST ITEMS

Item 1

Scenario

John's mother dropped out of school when she was in primary two (P.2), got married and produced John. With all the little money she had from selling porriadge, John managed to attend school and he is now in Senior two (S.2), John's head teacher punishes John wherever he speaks vanacular and now John speaks much of the English most times even when at home. One day John came singing about cells, and the mother became unhappy thinking John was a busing her. Another day John told his mother that she has very many types of cells and that they parts that enable them do their functions in her body. With a lot of anger, thinking it was too much, John's mother is planning to remove John out of school and they sell porriadge together.

Task;

Assuming you are John's biology teacher, write a speech you would deliver to John's mother to address the situation.

Item 2

Scenario

Tendo is a 15 year old girl at Kayera primary school. Her Auntie used to complain about her that she had started sleeping away from home. As much as the Aunt complained, Tendo did not change her behaviours. It is now 3 months and she rarely sleep at home. One day Tendo developed mild fever, mouth lips became re, and dry, lymph nodes became swollen, lost appetite and body weight and body was generally weak. In a lot of fear, Tendo now went back home and on first sight, Aunt asked what had happened. Tendo replied that it was the porriadge served at school that caused her all such signs and symptoms. This annoyed the Aunt to the extent of coming to school with a police officer to arrest the Director, head teacher and all the teachers; for serving porriadge that caused Tendo the above sings.

Task;

Having called by the director, as a specialized medical officer, write a piece of advise you would give Tendo's Aunts.

Item 3

Scenario

It is now a month without electricity in Buzibwera B many residents have now resorted to using of firewood for cooking. One day an old lady went to a nearby shrub, where she cut several trees down on stems. After 14 days, she went back to check on the firewood, only finding the tree stumps releasing watery substances from where she cut. It came to her surprise to see such and thought that parts of trees that remained in the soil after cutting the upper stem were urinating. She gathered the whole village to have a look at a tree urinating. On reaching that scene, village members came to agree that the woman might have ran mad. Immediately the chairman solicited some funds to take the lade to Butabika hospital, which the lady she resisted. The woman added that she is ready to remove all the clothes to whoever says that she is mad and the village members claim that the woman can do it because she once did it.

Task;

Assuming the police was notified and hired you as an expert in Botany, write a speech you would deliver in Buzibwera B to address the situation.

Item 4

Scenario

Akwakor is a 5 year old girl who is known to eat a lot. One day Akwakor's mother prepared posho which they ate for lunch with water. Akwakor became confused that every after eating she could become more energetic and satisfied. Her mother was also not sure on what is contained in posho that could make Akwakor to get satisfied and more energetic, the process through which it is formed, equation for the process, importance of the process and how energy was formed. When the mother consulted, the LC1 chairman , he told Akwakor's mother that she should not bather so much after all it might be the hold spirit that entered Akwakor's stomach and cause he to get satisfied and energetic. This confused Akwakor's mother the more.

Task;

Suppose you are the District Nutritionist, write an essay to explain to both the LC1 chairman and Akwakor's family about the truth of the issue at hand.

BIOLOGY PRACTICAL (PAPER TWO 553/2&3)

To score highly in a biology practical, the following skills have been proved to work for any candidate;

- Structure and approach of practical items
- How to present responses
- How to gain confidence

STRUCTURE OF THE BIOLOGY PRACTICAL PAPER

- Paper has One section
- Paper consists of two compulsory items
-The duration is 2 hours and 15 minutes or 30 minutes
- All items set in a scenario format and the scenarios do not contain a parameter a learner will be tasked to investigate e.g if a learner is tasked to carry out an investigation on starch, starch will not be talked about anywhere in the scenario.
- You work alone

ELEMENTS OF CONSTRUCT

Biology practical is set covering two (2) elements of construct/ areas of examination. I.e

Element of construct 1 (EC 1) - Involving Scientific skills, discovery and processes. Requires extended responses.

Element of construct 2 (EC 2) - Involving structure and function of living things. (Plants and animals)

Biology practical paper has two test items i.e number 1 and number 2

INTERPRETING ITEM 1 (REQUIRING SCIENTIFIC SKILLS)

- know it's a scenario
- know there's a real life problem/ challenge
- know that a problem needs an explained solution
- know that solution only through scientific investigation is required
- write a report

Element of construct 1 (EC 1)

This covers;

- food tests, enzyme activities, soil experiments, osmosis

🤔 Question? what is a scientific investigation?

✍ Response; a set of practical procedures to solve a certain problem

SKILLS AND METHODS INVOLVED;

- food tests
- observation
- incubation (enzyme)
- effect of solutions of different concentrations on living tissues..
- reading instruments
- recording results.

SAMPLE ITEM 1

Scenario;

5 year old son falls sick frequently; thin muscles; poor hair quality; doctor recommended to change diet. Sample of the food that constitute the main diet of the child has been provided before you.

TASK;

carryout a scientific investigation to determine the cause of the child's condition, explain and make a recommendation

✍ **Suggested response;**

Ask yourself, do i have

- any experiment i know in all the experiments, which one can solve the problems in the scenario?
- knowledge on how to write a report?

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SAMPLE ITEM 2

An old lady watered her plants with water whose source is not known, plant leaves seen bending and stems weak while others healthy with turgid leaves. The water she used is provided to you as solutions A and B.

TASK;

Carry out an investigation on solutions A and B, and advise the lady accordingly.

✍**Suggested response;**

> You can try it out with your teacher.

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WRITING A REPORT;

Components;
- aim
- hypothesis/ prediction
- materials
- variables
- procedures
- presentation/ observation and deductions
- analysis/ interpretation/ explanation/ conclusion
- recommendations

AIM

- This is not obtained from the task, but from the scenario and the cause of the problem
- should be brief and precise
- must investigate what is lacking because what is present is not the cause of the problem, and if found out, can't solve the problem because what's lacking will still cause the problem.

You can't investigate what's present because you are not sure what's contained in the food sample after all you (learners) are not the one who prepared a food sample.

HYPOTHESIS

- a guessed/ predictable cause of the problem
- is not a true and final cause of the problem
- assumed cause of the problem
- should not be a non - hypothesis e.g "calcium carbonate is not responsible for the colour of chalk " , " without light plants can not make food"
- should contain variables i.e dependent, independent and/ or controlled.

- should have cause and effect i.e " if " ..... " then "... e.g calcium carbonate is responsible for the colour of chalk.

Cause > presence of calcium carbonate

Effect > chalk being white "

Or Light affects the amount of food made by the plant.

Cause > presence of light

Effect > amount of food made

- should be testable
- E.g proteins are lacking in Jane's diet, where a buirettes test can be carried out.

VARIABLES

- what can be changed/ altered to achieve results from the investigation. Types of variables include;

- - **controlled** > one that the experimenter is able to adjust/ control/ measured e.g volume of solutions, length of specimens, duration of incubation, temperature of incubation
- - **independent variable** > known before an experiment begins, experimenter can not change and fixed e.g concentrations of solutions
- - **dependent variable** > not known before experiment is done, recorded as an outcome/ an observation/ result of the experiment and keeps on changing i.e not fixed

MATERIALS

- any tangible apparatus provided and reagents
- quantifying the apparatus/ materials is not recommended because number of apparatus required in different experiments keep on varrying.
- they have a maximum of 3 scores and they are marked based on errors made. More errors made the more reduction in scores from the 3 which is the maximum.

PROCEDURE / STEPS

- involves how to work with apparatus/ materials to produce steps rather than reproducing steps as it was in the KBC - knowledge based curriculum.
- must be coherent
- must be relevant
- must solve the problem
- volumes used must be indicated
- recorded in past tense

OBSERVATION AND DEDUCTIONS

- any chance/ results seen as a result of working with the apparatus/ materials
- results recorded in past tense
- initial, intermediate and final changes must be recorded
- colour and states (solution or precipitate) more important
- these deductions are not the final concrete conclusions, these are instead direct and instant remarks/ comments on/ about the steps taken and observations made.

DATA ANALYSIS / INTERPRETATION/ EXPLANATION/ CONCLUSION

- fact full interpretation of the hypothesis
- linking the results to solving the problem/ true cause of the problem

RECOMMENDATION

- advice to overcome the problem in the scenario

Element of construct 2 (EC 2)

How items are set;

- Scenario format

- Skills required to solve the problem are;

e.g drawing, observation, identification, functions, comparisons, and adaptations of structures of arthropods (insects), plants (roots, stems, leaves, fruits, flowers, and seeds), mammals (bones) and birds (feathers).

- involves construction of a dichotomous key to identify structures of arthropods, plants, mammals and birds
- drawings should cover at least three thirds of the drawing space.
- always your drawing is in the right view i.e dorsal, anterior, posterior, ventral, lateral, longitudinal or transverse/ cross section.
- sketching before actual drawing is not allowed.
- labelling lines should not be broken, label space (should touch part and labelling word/ name) or even bear arrow heads

QUALITIES OF A GOOD DRAWING

- Title; a word drawing should be used but not diagram
- Neatness; achieved without rubbing
- Magnification; obtained from; $\frac{\text{image length}}{\text{specimen length}}$
- Continuous and good outline
- Labelled; without labelling lines meeting each other.
- sharp HB pencil should be used

SUCCESS BEGINS AT THE END OF YOUR COMFORT ZONE