

# **BIOLOGY THEORY 553/1**

## **FACILITATION**

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# Paper format

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- This paper consists of two sections A and B. Duration is 2 hours and 30 minutes
- Section A is made up of scenario items broken down into simpler tasks, while section B is made up of scenario items each with one block task/essay. Section B has two parts each with two items.
- A task taker is expected to attempt five questions in all. Including three from section A and two from section B.
- All items of section A are compulsory. Attempt one item from each part of section B.

# Paper composition

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- The items are set from groups of topics with related body of knowledge known as elements of construct. Therefore each element of construct is responsible for a single item.
- This means that there are **five elements of construct**; from which five items are set. The following are the different elements of construct;

# Elements of construct

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- The learner appreciates **diversity of living things** and sustainability of the **natural resource**. This involves *classification* and *ecology*-especially natural resources. Item 4/5
  - The learner Understands how plants obtain and use nutrients to meet their requirements during which raw materials and products are carried to and from various organs involved.//**plant physiology**. Item 1
  - Understands how mammals obtain and use nutrients to meet their energy requirements during which raw materials and products are carried to and from various organs involved. //**animal physiology**. Item 2

# Elements of construct –cont'd

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- The learner appreciates how human body coordinate various activities and adjust to ensure normal functioning of body systems. //Item 2
- The learner appreciates how characteristics are inherited in living organisms passed to generations through reproduction and manifested as organisms grow. //**inheritance/genetic, reproduction, cell and division, growth and development.** Item 3

# Basis of Assessment

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**For all items;** codes are Understanding (U) and Application (A)

(a) For example **For element of construct one.**

- **Understand** the importance of the natural resource in context. (U)
- **Apply** biology for sustainable use of a natural resource in life forms. (A)

**NB.** *Much emphasis should be natural resources as most of classification will be assessed in practical.*

However these levels of achievement can be broken down more into several tasks. For example two or more tasks of section A may require just Understanding.

# Basis of assessment –cont'd

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**(b) For second element.**

- Understand the role/function of organ/structure/processes in plants.
- Apply the knowledge of plant biology to explain how plants obtain/use/processes to overcome challenges experienced.

**(c) For the third element.** Every basis is just as in element two.

**(d) For the fourth.**

- Understand the concept/process/disorder/challenge in context or/and understand the causes/effect/symptoms/disorder and appreciates strategies to manage them.

# Basis of assessment –cont'd

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## (e) From the fifth element.

- Understand genetics, variation, reproduction growth and development
- Apply genetics, variation and reproduction to manage diseases/disorder how to manage challenges/problems.

# Success criteria

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(a) **The following is the success criterion for item one.**

- Associate to the named natural resource most of which should be to life forms
- Explain solutions to challenges/problems identified or/and explain the benefits of natural resources concerned most of which should be for life forms.
- The reason should be a correct explanation. No score for one who just outlines, when the task says explain.

# Success criteria –cont'd

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## (b) For the second element of construct

- Explains the roles of structures/organs/processes involved.
- Explains/describes roles of plant processes involved to demonstrate how to overcome challenges.

## (b) For the third element. Just as in the second element.

## (c) For the fourth element.

- Explains/describes role of structure/processes involved or explain causes/effects/symptoms of disorder/problem.
- Explain strategies to manage/avoid disorder/problem/challenges.

# Success criteria –cont'd

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## (e) For the fifth element of construct.

- Describe/explain roles of structures/concepts/processes involved and explain symptoms/problems/causes of disorders.
- Explain the strategies to manage/avoid the challenges/problems.

# Sample scenario item

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1.

David cleared a large piece of wetland for growing crops. The animals that were previously common in the wetland moved away and started disturbing the nearby communities. Recently following heavy rains the wetland flooded and affected the community. After two weeks, the flooded dirty water reduced but left small ditches which retained water for many weeks. Around this time many sick people were seen in nearby healthy centers. The environmental officer attributes the observations to David's activities.

# Sample scenario cont'd

## + scoring grid

### TASKS

- 
- (a) Explain to David how the used farming activities in the area caused observations in the scenario. Suggest what can be done to minimize the effects.
  - (b) Why should the environment used by David be conserved.

### Success criteria

- The reasons given should be for **only** life forms and in line with scenario.
- Every point given (01 score); should be explained (01 score).
- At least three quarters of the expected responses: from observations in scenario = 04 scores, then 03, 02, 01, 00 according to the given responses.

# Scoring grid cont'd

- ## • Understanding;

By listing, UL

By explanation,      UE

Three quarters and above of points explained = 04 scores (**Maximum scores**)

Two quarters of points explained = 03 scores

A quarter of the points explained = 02 scores

Point(s) not explained = 01 score

# Scoring grid -cont'd

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**(b) For example.** Water catchment; that reduces flooding; //or acting as habitat for aquatic animals, birds.

- One reason for different observations. This may reduce total score due to some points not explained.
- More than one reasons for the same observation. This is okay as long as the required points have all got explanations.
- All these should be given basing on observations made in the scenario.
- Criteria changes when very many points are given due to applying of  $\frac{3}{4}$  of points.

# Special considerations in genetics

- A letter identified together with the phenotype it represents; (01 e)
- Parental phenotypes identified with a crossing sign in between them; (01 e)
- Genotypes identified correctly with a crossing sign in between; (01 e)
- Showing meiosis and how it occurs, is necessary but doesn't score.
- Gametes separated enclosed in circles and with/without crossing sign; (01 e)
- Random fertilization/just shown and resulting genotypes; (01 e)
- Phenotypes of offspring identified correctly; (01 e)

# Closing remarks

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- In explanations one can use drawings but they should be talking/communicating drawing. Such as correction of eye defects. As long as everything is descriptively labelled/annotating.