Item 1

SCORING SCHEME

Hotline: 0776/0754958643

SCORING GRID

Element of construct	Basis of assessment	Scoring criteria			
		Evidence/skills/ability exhibited [Justification]	**Code**	**Score/collection [Max.score]**	**Total score**
Experimentation and processing. [Science process/inquiry skills in biology]	Title	Gives the title of the experiment, indicating the variables. **01**	a	1a	30
	Aim	Provides the aim of the experiment **01**	b	1b	
	Hypothesis	States the hypothesis, either null or alternative; indicating both variables **02**	c	1c	
	Variables	States the variables; ✓ Independent **01** ✓ Dependent **01** ✓ Controlled. **03**	d	3d	
	Apparatus/materials	Lists requirements 6	e	3e	
	Procedure(s)	Outlines a procedure; ✓ Relevant to the experiment. **04** ✓ Coherent to the experiment. **04** Manages the controlled variables. **02**	f	10f	
	Results/ presentation of data	Presents accurate/correct data logically [table] **09**	g	4g	
	Analysis/Discussion (explanation)	Explains/interprets the data **05**	h	3h	
	Conclusion	Concludes basing on the data. **03**	i	2i	

	Recommendations	Gives relevant advice & suggests the food supplements required **03**	j	2j	

SUGGESTED RESPONSES

(a) **Title:** Investigation of the effectiveness of food sample T in treating child health conditions[a]

(b) **Aim:** To identify the food nutrients in food sample T responsible for treating child health conditions[b]

(c) **Hypothesis:** Food sample T contains all food nutrients[c] required by the body [c].

(d) **Variables:**

Independent variable: Food sample T[d]

Dependent variable: Food nutrients(availability/concentration) [d].

Controlled variables:

- Concentration of reagents[d], pH[d], amount/size of T[d] used (time for boiling, temperature [for some test])

(e) **Materials**

- Specimen T[e], Iodine solution[e], Benedict's solution[e], copper(II) sulphate solution[e], aqueous sodium hydroxide solution[e], droppers (10) [e], dilute hydrochloric acid[e], ethanol[e], DCPIP solution[e], 6 test tubes[e], 1 boiling tube[e], knife[e], mortar and pestle[e], distilled water[e], measuring cylinder(10ml) [e], tripod stand[e], wire gauze[e], heat source[e] (Bunsen burner/stove), thermometer[e], stop clock[e].

(f) **Procedure**

In separate test tubes, the following tests were carried out on food sample T;

Iodine test

- To $1cm^3$ of food sample/ solution T in a test tube, added 2 drops of Iodine solution[f].

Benedict's test

- To $1cm^3$ of food sample/solution T in a test tube, added $1cm^3$ of Benedict's solution and boiled for 1 minute[f].

Hydrolysis test

- To $1cm^3$ of food sample/solution T in a test tube, added $1cm^3$ of dilute hydrochloric acid and boiled for 1 minute[f]. Cooled under tap (cold) water and then added $1cm^3$ of dilute sodium hydroxide solution followed by $1cm^3$ Benedict's solution and boiled for 1 minute[f].

Biuret's test

- To $1cm^3$ of food sample/solution T in a test tube, added $1cm^3$ of dilute sodium hydroxide solution followed by 2/3 drops of copper (II) sulphate solution (and shaken vigorously) [f].

DCPIP test

- To $1cm^3$ of DCPIP in a test tube, added the food sample/solution T drop by drop(dropwise) [f].

Emulsion test

- To $1cm^3$ of the food sample/solution T in a test tube, added $1cm^3$ of ethanol followed by 2 drops of distilled water and shaken[f].

(g) **Results**

OBSERVATIONS	DEDUCTIONS
Iodine test: The turbid solution turned to black solution[g].	Much starch present[g].
Benedict's test: *The turbid solution turned to a pale blue solution then to green solution, yellow precipitate, orange precipitate and finally brown precipitate on boiling*[g].	*Much reducing sugar present*[g].
Hydrolysis test: The turbid solution turned to pale blue solution that persisted on boiling[g].	Non-reducing sugar absent[g].
Biuret's test: The turbid solution turned to violet/deep purple solution[g].	Much protein present[g].
DCPIP test: The deep blue solution turned colourless solution[g]	Vitamin C present[g]
Emulsion test: No white emulsion formed[g]	Lipid absent[g].

ACC: Ignore much/quantity under deductions.

(h) **Analysis/discussion**

- T contains much starch, much reducing sugar which are oxidized to provide energy in the body and prevents marasmus[h], much proteins for building the body (formation of body structures)/prevents kwashiorkor[h], vitamin C which boosts immunity/prevents scurvy[h]. However, it lacks lipids for provision energy[h] but this can be provided by the much starch and reducing sugar present[h].

(i) **Conclusion**

- Food formula T contains (much) starch[i], (much) reducing sugars[i], (much) proteins and vitamin C[i].

(j) **Recommendations**

- Mr. Bukenya should encourage mothers in the village to include T in their babies' diet[j] and also supplement it with fish/liver and vegetables/dairy products like milk to supply lipids[j] and more minerals to permanently solve such challenges[j].

COMMENTARY

- **Ignore quantity in each case.**

Item 2

SCORING GRID

Element of construct	**Basis of assessment**	**Scoring criteria**			
		Evidence/skills/abilities exhibited [Justification]	**Code**	**Score/collection [Max. score]**	**Total score**
Application of biological knowledge in identification, grouping and physiology etc.	Identification	Gives the **identity** of the specimen using observables. **01**	a	1a	30
	Classification	**Classifies** the specimen at least up to order level. **04**	b	3b	
	Ecology & mode of life	States the **habitat** of the specimen. **01** State the **adaptations** of the specimen to its habitat. **03** Provides the **habits** of the specimen; ✓ Feeding. **01** ✓ Diet with a reason. **02** ✓ Locomotion **01**	c	7c	
	Role in crop destruction	States the dangerous effect of the specimen **02**	d	6d	
	Adaptability to crop destruction	States the adaptations of the specimen to crop destruction **04**			
	Drawing skills in biology and labelling (support)	Makes a well labelled drawing of the head showing jaws as evidence Biological skills required; ✓ Title **01** ✓ Magnification **01** ✓ Outline **01** ✓ Accuracy **01** ✓ Neatness **01** ✓ Correct labelling of jaws parts. **02**	e	7e	
	Remedies	Suggests control measures **08**	f	6f	

SCORING GUIDE

Specimen M is responsible for the damage[a].

Identity: Insect[a]

Classification

Kingdom: Animalia[b]

Phylum: Arthropoda[b]

Class: Insecta[b]

Order: Isoptera[b]

Ecology & mode of life

- **Habitat**: Terrestrial mainly in termitarium/termite mound/ant hill[c].

Adaptations to the habitat/to its mode of life

- Has two (2) strong, pointed mandibles for piercing predators/defense[c].
- Possess a brightly coloured head to scare away predators[c].
- Has a large head to provide strong biting force[c].

Habits:

- **Feeding**: Feeds on solid substances like wood[c].
  Diet: Wood/plant materials[c]
- **Reason**: Has hard, sharp/pointed mandibles for cutting wood/plant materials[c].
- **Locomotion**: Locomotes by walking and running very fast[c].
- Destroys crops/plants [d] by eating on roots of crops[d].

Adaptations/Adaptability to crop destruction

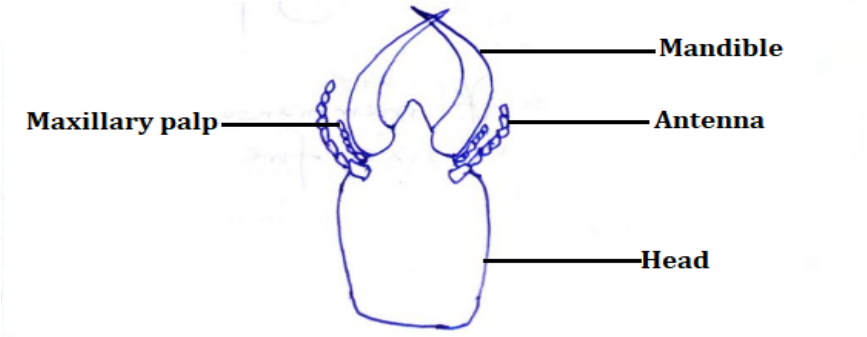
- Has sharp, hard mandibles [d] for easy cutting of plant roots/stems [d].
- Has a large head [d] to provide strong biting force [d].

Dangerous effect of specimen M

- Bits/eats/chops plant roots, stem making holes in them (thus destroying crops)[d].

Support/evidence

A drawing showing the head of specimen M in a dorsal view [e].



Control measures

1. Spraying with insecticides/termiticides [f].
2. Practising crop rotation to disrupt feeding patterns of specimen M [f].
3. Regular inspection for signs of damage [f].
4. Installing physical barriers like treated wooden stakes around the garden perimeter to prevent entry of specimen M [f]
5. Applying soil barriers to prevent access of specimen M to crops [f].
6. Using repellents to repel of specimen M [f]
7. Applying integrated pest management for effective control of specimen M [f.]
8. Biological control, using natural enemies of specimen M like army ants, fire ants and beetles to feed on the specimen [f].

END