

553/2
BIOLOGY
Paper 2
2024



UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY

Paper 2
Practical

SCORING GUIDE

EXPECTED RESPONSES 553/2

Qn. 1

Aim: To investigate the nutrients present in the food samples **A** and **B**.

Hypothesis: Frequent sickness of Mary's child is due to absence of required nutrients in food samples **A** and **B**.

List of Apparatus, reagents, solutions and Materials used:

- Solutions A and B.
- Iodine solution.
- Benedict's solution.
- Dilute hydrochloric acid.
- Dilute Sodium hydroxide.
- DCPIP.
- Copper(II) sulphate solution.
- Heat source.
- Test tubes and droppers.

Procedure, Observations/ data presentation

Procedure	Sample	Observations	Deductions
To 1 cm ³ of food sample add 2 drops of Iodine solution	A	Cloudy/turbid/milky solution turns black/ blue-black	Starch present
	B	Cloudy/turbid/milky solution turns black/blue-black	Starch present
To 1 cm ³ of food sample add 1 cm ³ of Benedict's solution and boil	A	Cloudy/turbid/milky solution turns blue and the blue colour persists.	Reducing sugars absent
	B	Cloudy/turbid/milky solution turns blue and the blue colour persists.	Reducing sugars absent
To 1 cm ³ of food sample add 1 cm ³ of dil HCl _(aq) and boil, cool under tap water. Add 1 cm ³ dil NaOH _(aq) followed by	A	Cloudy/turbid/milky solution turns blue and the blue colour persists.	Non reducing sugars absent
	B	Cloudy/turbid/milky solution turns blue and the blue colour persists.	Non reducing sugars absent

2 cm ³ of Benedict's solution and boil.			
To 1 cm ³ of food sample add 1 cm ³ of dil NaOH _(aq) followed by 4 drops of CuSO _{4(aq)}	A	Cloudy/turbid/milky solution turns blue and the blue colour persists.	Proteins absent
	B	Cloudy/turbid/milky solution turns blue and then purple.	Proteins present
To 1 cm ³ of DCPIP add the food sample dropwise until in excess	A	Deep blue colour was discharged <i>(if the cassava was very fresh from the garden)</i> OR	Vitamin C present
		Deep blue colour persists <i>(if the cassava not very fresh e.g. from market)</i>	Vitamin C absent
	B	Deep blue colour persists	Vitamin C absent

Conclusion / Nutrients present in the baby's food are:

Option 1: Starch (carbohydrate), Proteins, and Vitamin C.

Option 2: Starch (carbohydrate), proteins.

Recommendations and Advice

Option 1: the child's food has all the required nutrients. The sickness is not due to the current food nutrients provided. The child may be sick due to other causes, hence take the child for further examination by medical personnel.

Option 2: the child's food is lacking vitamin C, hence the frequent sickness is possibly deficiency of vitamin C. Provide the child with foods rich in Vitamin C e.g. oranges, mangoes, passion etc. so as to boost the child's immunity.

Qn. 2

a)

i) Organism Y sensed the location of the classroom and possible food source using its compound eyes and antennae respectively. It used its wings to fly and entered the classroom. It survives by using its proboscis to feed on liquid food available in the classroom.

Organism X sensed the location of food/wood in the classroom block using its antennae. It used its mandibles to dig barrows to access the classroom block and feed on the wood.

ii) Organism X is responsible for the damage caused.

Because it has hard and strong pair of mandibles that are capable of cutting the timber/wood in the classroom block. It can feed on solid materials such as wood

b) A drawing of the head of specimen X