THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/2A **BIOLOGY 2A**

(ACTUAL PRACTICAL A)

(For Both School and Private Candidates)

Time: 2:30 Hours **ANSWERS** **Year: 2001**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You have been provided with paste S_1.

(a) Record your experimental work as shown in Table 1:

Test	Procedure	Observations	Inference
Starch	Add iodine solution to the paste	Blue-black coloration	Starch is present
Reducing sugar	Add Benedict's solution, heat in a water bath	Brick-red precipitate forms	Reducing sugar present
Protein	Add Biuret solution and shake gently	Purple coloration appears	Protein is present
Lipid	Mix with ethanol, shake, then add water	Milky emulsion appears	Lipid is present

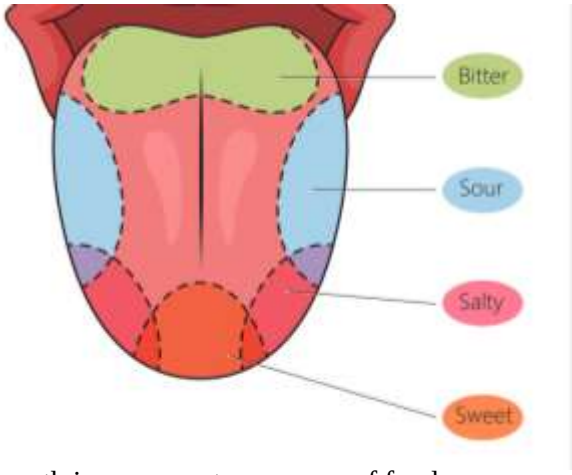
(b) Name the nutritional problems a child is likely to suffer if fed with a diet deficient/lacking the food substances you have identified. Give reasons.
- Lack of protein may cause kwashiorkor, characterized by stunted growth, swollen belly, and muscle wasting
- Lack of carbohydrates can lead to energy deficiency, tiredness, and poor brain development
- Lack of fats can cause poor insulation and vitamin deficiency (A, D, E, K)

(c) Give two natural sources of each of the food substances you have identified in S_1.
- Starch: Maize, rice
- Reducing sugar: Honey, ripe banana
- Protein: Eggs, beans
- Lipid: Groundnuts, avocado

2. (a) Name the different sensory organs visible.
- Tongue
- Eyes (visible in mirror)
- Ears (partially visible)
- Skin (lips and inner mouth)

(b) What are the functions of each sense organ observed?
- Tongue: Detects taste and temperature
- Eyes: Detect light, allow vision
- Skin: Detects pressure, temperature, and pain
- Ears: Detect sound and maintain balance

(c) Draw and label the sense organ you saw in the mouth. In your diagram show the location of the sensory structures associated with the various named stimuli.



(d) Name the fluid secreted in the mouth in response to presence of food.
Saliva

(e) State two functions of the liquid named in (d) above in digestion.
- Moistens food to ease swallowing
- Contains salivary amylase which starts the digestion of starch

3. (a)(i) Identify specimens A and B using their common names.
A: Cactus
B: Water lily

(ii) Name the habitats of specimens A and B.
A: Desert or arid region
B: Aquatic environment (ponds, lakes)

(iii) Briefly explain how the different structures observed on A and B adapt the plants to their habitats.
- A (Cactus): Has thick succulent stem to store water, reduced spines instead of leaves to minimize water loss
- B (Water lily): Broad leaves to float, long flexible stalks, and air spaces for buoyancy

(iv) What term is used to describe these plants in relation to water economy?
A: Xerophyte
B: Hydrophyte

(b)(i) Identify specimens C and D.
C: Mushroom
D: Fern

(ii) To which kingdoms do specimens C and D belong?
C: Fungi
D: Plantae

(iii) In which way(s) is specimen C similar and yet different from specimen D?
Similarities: Both reproduce via spores, both lack flowers

Differences: C has no chlorophyll and absorbs nutrients from organic matter, while D has chlorophyll and carries out photosynthesis. C is a saprophyte, D is autotrophic.