

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

133/3B

**BIOLOGY 3B
ALTERNATIVE B PRACTICAL
(For Both School and Private Candidates)**

Time: 3 Hours

Monday 13 May 2002 a.m.

Instructions

1. This paper consists of **THREE (3)** questions.
2. Answer **ALL** questions.
3. Read each question carefully before you start answering it.
4. The mark allocation is indicated at the end of each question.
5. Cellular phones are **not** allowed in the examination room.
6. Write your Examination Number on each page of your answer booklet.

This paper consists of 3 printed pages.

1. Dissect specimen S₁ provided in the usual way to display the spinal nerves. Note that it is important to remove the stomach, lungs, heart and the floor of the mouth as well as the kidneys. Take care not to cut the aorta.

(a) Make a large drawing of your dissection.

(b) Label on your drawing the following:

- (i) hypoglossal nerve
- (ii) branchial nerve
- (iii) sympathetic nerve
- (iv) sympathetic ganglion
- (v) ramus communicans
- (vi) spinal nerves no. 5, 6, 7, 8, 9 and 10
- (vii) sciatic plexus
- (viii) sciatic nerve.

- (c) (i) What are spinal nerves and what is their general function?
 (ii) What does the following statement mean? "All spinal nerves are mixed nerves".
 (iii) **LEAVE YOUR DISSECTION WELL DISPLAYED FOR ASSESSMENT.** (20 marks)

2. (a) Label five test-tubes 1 – 5 and in test-tube 5 collect saliva as follows:

- (i) Rinse the mouth with water to remove food residues
- (ii) Chew a rubber band to stimulate the flow of saliva
- (iii) Collect about 30 cm³ saliva.

(b) Using a graduated pipette, place 5 cm³ of 2 % solution Y in test-tubes 1 – 4.

(c) Rinse the pipette and draw up 4 cm³ saliva. Place 2 cm³ in each of test-tubes 2 and 3 and shake the test-tubes to mix the contents. Leave the test-tubes for 5 minutes and copy the table below into your answer booklet.

(d) After 5 minutes, add 3 drops of iodine solution to test-tubes 1 and 2.

(e) Use the graduated pipette to add 3 cm³ Benedict's solution to test-tubes 3 and 4 and place both test-tubes in the water bath for 5 minutes.

(f) Compare the final colours in the test-tubes and complete the table of results.

TEST-TUBE	CONTENT	TEST WITH	RESULTS	INTERPRETATION
1	2 % solution Y	Iodine solution		
2	2 % solution Y + saliva	Iodine solution		
3	2 % solution Y + saliva	Benedict's solution		
4	2 % solution Y	Benedict's solution		

Answer the following questions:

- (i) Test-tube 2 contained a food substance present in solution Y at the beginning of the experiment; how do you explain the reaction with iodine solution at the end of the experiment?
- (ii) What food substance is Benedict's solution a test for?
- (iii) Was this food substance present in test-tube 3 or 4 at the **BEGINNING** of the experiment?
- (iv) What evidence have you to support your answer?

- (v) What evidence is there to suggest that this food substance was present in test-tube 3 at the END of the experiment?
 - (vi) What chemical change could have taken place in test-tubes 2 and 3 after adding saliva, which would explain the results in these tubes after applying the iodine test and Benedict's test?
 - (vii) What part could saliva have played in this chemical change?
- (g) (i) Name the natural food sources for the food substance contained in solution Y.
- (ii) Georgina has been diagnosed by Dr. Issa that she has hypertension (high blood pressure) as a result of her heavy weight and heavy deposition of fat around the heart and in blood vessels. Suggest giving reasons which among the above mentioned food sources in 2. g (i) Georgina should be advised to eat in order to reduce the high blood pressure to normal. (15 marks)
3. (a) Study specimen K provided:
- (i) State the common name of specimen K
 - (ii) State the kingdom to which specimen K belongs
 - (iii) State animal like characteristics exhibited by members of the kingdom to which specimen K belongs
 - (iv) Draw a large diagram to represent the reproductive structures of specimen K.
- (b) (i) Study specimen L, carefully
- (ii) Draw the floral diagram and write down the floral formula of specimen L.
- (c) Study specimen M:
- (i) Give the phylum and class of specimen M
 - (ii) Draw a well labelled diagram of specimen M
 - (iii) Name the structures in specimen M which are involved in locomotion. (15 marks)