

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

**133/3A**

**BIOLOGY 3A  
(ACTUAL PRACTICAL A)  
(For Both School and Private Candidates)**

**Time: 3:20 Hours**

**Year: 2023**

**Instructions**

1. This paper consists of **three (3)** questions.
2. Answer **all** the questions.
3. Question one (1) carries **twenty (20)** marks and the other two (2), carry **fifteen (15)** marks each.
4. All writing must be in **blue** or **black** ink **except** diagrams which must be in pencil.
5. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).



2

1. You have been provided with specimen **B**. Dissect the specimen in a usual way to fully display the digestive system.
- (a) Draw a large diagram of your dissection and label ten parts.
- Leave your dissection properly displayed for assessment.**
- (b) Explain five adaptations of the digestive system to its role in specimen **B**.
- (c) (i) Identify two structures of digestive system which are more developed in specimen **B** than in human being.  
(ii) What effects will specimen **B** face if the structures you mentioned at 1(c)(i) will fail to function normally?

2. You are provided with solution **Q**. Carry out the experiments in item (i) – (v), then answer the questions that follow:

- (i) Take three test tubes and label them as test tube **A**, **B** and **C**.
- (ii) Put 2 ml of the solution **Q** to each of the test tubes **A**, **B** and **C**.
- (iii) Add 2 ml of dilute hydrochloric acid to test tube **A** and warm the mixture. Then add 4 ml of Benedict's solution and observe the changes.
- (iv) Add 2 ml of dilute hydrochloric acid to test tube **B** and warm the mixture. Then add 3 ml of sodium hydroxide solution followed by 4 ml of Benedict's solution and observe the changes.
- (v) Warm the solution contained in test tube **C**, then add 2 ml of Benedict's solution and observe the changes.

### Questions

- (a) Present your observations in experiments (iii) – (v) as shown in Table 1.

**Table 1**

Experiment	Observation
(iii)	
(iv)	
(v)	

- (b) Name the type of food substance contained in solution **Q**.
- (c) Why the experiments (iii) – (v) provided different results on Benedict's test? Give two reasons for each.
- (d) Briefly explain how the following factors affect enzyme activity in experiment (iv):  
(i) Temperature  
(ii) pH.

3. You have been provided with specimens **P<sub>1</sub>**, **P<sub>2</sub>**, **P<sub>3</sub>**, **P<sub>4</sub>** and **P<sub>5</sub>**. Observe the specimens carefully then, answer the following questions:

P<sub>1</sub> ✓  
Crustacea

P<sub>2</sub> ✓  
Grasshopper

P<sub>3</sub> ✓  
Bee

P<sub>4</sub>  
Spider

P<sub>5</sub>  
Millipede

(a) Why were specimens **P<sub>1</sub>**, **P<sub>2</sub>**, **P<sub>3</sub>**, **P<sub>4</sub>** and **P<sub>5</sub>** formally placed in the same Phylum? Give two reasons.

(b) Use the following classification key to identify the specimens **P<sub>1</sub>**, **P<sub>2</sub>**, **P<sub>3</sub>**, **P<sub>4</sub>** and **P<sub>5</sub>**:

- 1a Wings present..... 2
- 1b Wing absent..... 3
- 2a Outer wings are soft..... \_\_\_\_\_
- 2b Outer wings are harder ..... \_\_\_\_\_
- 3a Have numerous similar limb ..... \_\_\_\_\_
- 3b Similar limbs absent ..... 4
- 4a The first appendage bear prehensile chelicerae ..... \_\_\_\_\_
- 4b The first appendage serves as jaw..... \_\_\_\_\_

(c) Identify the structures concerned with gaseous exchange in each of the specimens **P<sub>1</sub>**, **P<sub>2</sub>**, **P<sub>3</sub>**, **P<sub>4</sub>** and **P<sub>5</sub>**.

(d) Outline two common adaptation features for the structures you named in 3(c).

(e) Draw a large, neat and well labeled diagram of specimen **P<sub>1</sub>**.