**NAME: …………………………………………. INDEX NO: ……………………………….**

**SCHOOL: ……………………………………… DATE : ……………………………………**

**CANDIDATE’S SIGNATURE: …………………..**

**231/3**

**BIOLOGY**

**PAPER 3**

**(PRACTICAL)**

**TIME: 1 ¾ HOURS**

**INSTRUCTIONS TO CANDIDATES:**

1. *Write your* ***Name*** *and* ***Index Number*** *in the spaces provided.*
2. ***Sign*** *and write the* ***Date*** *of Examination in the spaces provided.*
3. *Answer all the questions in the spaces provided.*
4. *You are required to spend the first 15 minutes of the 1 ¾ hours allowed for this paper reading the whole paper carefully before commencing your work.*
5. *Additional pages must not be inserted.*
6. *This paper consists of 4 printed pages.*
7. *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*

**FOR EXAMINER’S USE ONLY**

|  |  |  |
| --- | --- | --- |
| **QUESTION** | **MAX. SCORE** | **CANDIDATE’S SCORE** |
| 1 | 12 |  |
| 2 | 14 |  |
| 3 | 14 |  |
| **TOTAL** | **40** |  |

**SECTION A (40 MARKS)**

**Answer all questions in this section in the spaces provided.**

1. You are provided with specimen Q, which is a fresh potato, liquid R (Hydrogen peroxide) and reagents 1% copper sulphate, 2M sodium hydroxide and iodine solution. Use them to carry out the tests below.
	* + 1. Using a scalpel, cut two small cubes measuring 1cm x 1cm x 1cm from the fresh potato. Place one of the cubes in boiling water for 10 minutes, then remove the cube and let it cool. Place it in a boiling tube and label it A.

Place the fresh piece of potato cube in another boiling tube labelled B and then add equal amounts of hydrogen peroxide to each test tube at the same time. Write your observations.

**Observations:**

* + - * 1. Boiling tube A (1mk)

……………………………………………………………………………………………….

* + - * 1. Boiling tube B (1mk)

……………………………………………………………………………………………….

* + - 1. Explain your observation in (i) and (ii) above. (4mks)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

* + - 1. Crush a small piece of the remaining potato in a mortar. Add a little amount of distilled water to make a mixture. Use it to carry out food tests below. (6mks)

|  |  |  |  |
| --- | --- | --- | --- |
| **Food substance** | **Procedure** | **Observation** | **Conclusion**  |
|  |  |  |  |
|  |  |  |  |

1. Below are photographs labeled P, Q, R, S, T and U of fruits obtained from different plants. Examine them and answer the questions underneath.
	* + 1. With reasons, determine the modes of dispersal for the fruits labeled Q and R . (4mks)

Q:……………………………………………………………………………………………………..

Reasons:…………………………………………………………………………………………………………………………………………………………………………………………………….

R:……………………………………………………………………………………………………..

Reasons:…………………………………………………………………………………………………………………………………………………………………………………………………….

* + - 1. State the form of placentation in Q, S, T and U. (4mks)

Q:……………………………………………………………………………………………………

S:…………………………………………………………………………………………………….

T:……………………………………………………………………………………………………

U:…………………………………………………………………………………………………….

* + - 1. With a reason, identify the type of fruit represented by specimen P. (2mks)

Type of fruit:……………………………………………………………………………………….

Reason:…………………………………………………………………………………………….

* + - 1. Below is a photomicrograph of a certain process in reproduction. Study it carefully and answer the questions that follow.



* + - * 1. Identify the process shown in the photomicrograph. (1mk)

………………………………………………………………………………………………….

* + - * 1. Name the exact stage and place of the process shown in the photomicrograph.(1mk)

……………………………………………………………………………………………………………………………………………………………………………………………………

* + - * 1. What is the significance of the process at its completion? (1mk)

…………………………………………………………………………………………………………………………………………………………………………………………………….

1. Figure 1 represents parts of two adjacent liver cells as seen under an electron microscope. Study the micrograph and answer the questions that follow.



* + - 1. (i) Name the organelles labelled P, R, T. (3mks)

P:……………………………………………………………………………………………………

R:…………………………………………………………………………………………………….

T:……………………………………………………………………………………………………

(ii) State **one** function of each of the organelles labelled Q and S. (2mks)

Q:……………………………………………………………………………………………………

S:…………………………………………………………………………………………………….

(iii) The magnification of the cells in the micrograph is x20,000. Use a ruler to measure

 the radius of the nucleus between points X and Y in millimeters.

 Radius of nucleus:…………………………………..mm (1mk)

(iv) Calculate the actual radius of the nucleus before magnification in micrometers (µm)

 Q: (1mk)

* + - 1. Figure 2 represents different types of muscles. Study them carefully and answer the questions that follow.



* + - * 1. Identify the muscles labelled C and D. (2mks)

C:……………………………………………………………………………………………

D:……………………………………………………………………………………………

* + - * 1. Using observable features only; state **two** differences between muscles labelled B and D. (2mks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

* + - * 1. State **one** function of each of the muscles labelled B and C. (2mks)

Q:……………………………………………………………………………………………

S:……………………………………………………………………………………………/

* + - * 1. Give **one** adaptation of a muscle labelled C to its function. (1mk)

……………………………………………………………………………………………………………………………………………………………………………………………..