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FORM TP 2006004

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CARIBBEAN EXAMINATIONS COUNCIL

**SECONDARY EDUCATION CERTIFICATE
EXAMINATION**

BIOLOGY

Paper 04/2 – Alternative to SBA

General Proficiency

2 hours

In addition to the 2 hours, candidates are allowed 10 minutes in order to read through the entire paper. Writing may begin during the 10-minute period.

REFERENCE

READ THE FOLLOWING DIRECTIONS CAREFULLY

- 1. Answer ALL questions.**
- 2. Use this answer booklet when responding to the questions. For EACH question, write your answer in the space provided and return the answer booklet at the end of the examination.**

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

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01207042/JANUARY/F 2006

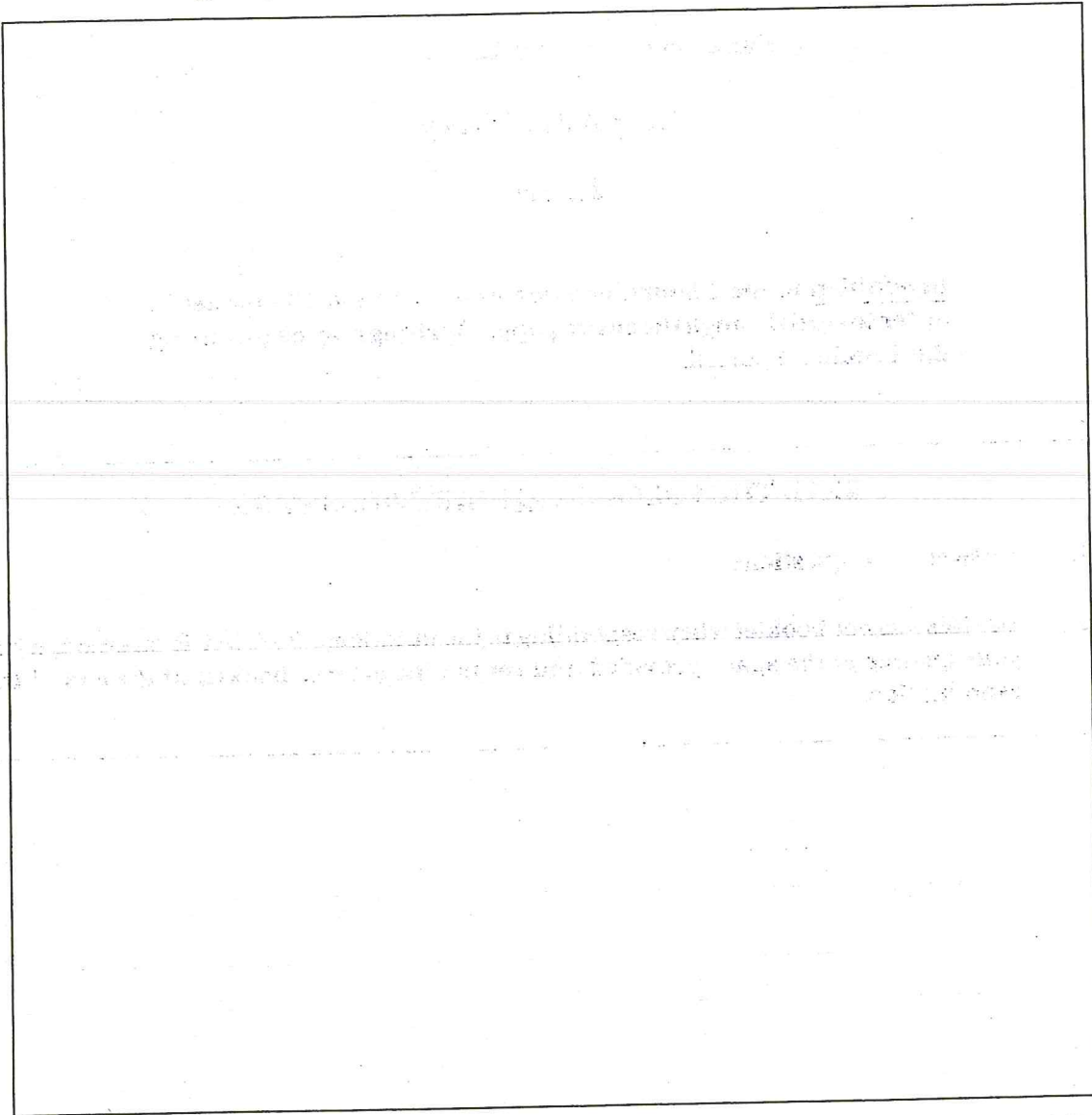
You should NOT spend more than 30 minutes on Question 1.

1. You have been provided with a flower of the hibiscus plant.

(i) Measure the length of the entire flower and record the length.

Flower length: _____ (1 mark)

(ii) Make a drawing of the hibiscus flower in the space provided below. (Do NOT label the drawing).



Title: _____

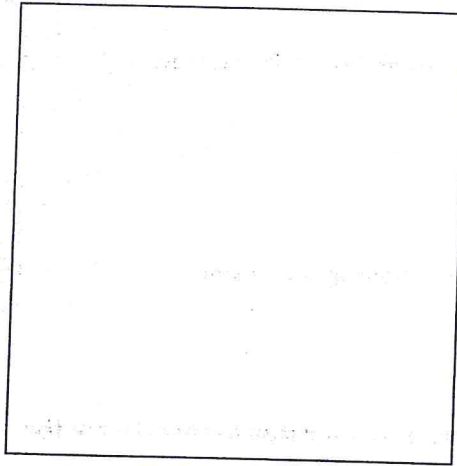
Magnification: _____

(7 marks)

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- (iii) Carefully remove all the petals, sepals and bracts to expose the essential parts of the flower. Use the dissecting needle to split the stamen tube to expose the ovary. Remove and cut across the ovary to show the arrangement of the ovules.

In the box below, make a drawing of a cross-section of the ovary as seen in the dissection. (You may use the hand lens. Labels, magnification and title are NOT required).



(3 marks)

- (iv) Describe the fruit that would be produced from the ovary you dissected.

.....
.....

(2 marks)

- (v) Describe a test to show that **leaves of the hibiscus** are organs of photosynthesis. Explain ONE precaution to be taken in conducting the test.

Test:

.....
.....
.....
.....
.....

(5 marks)

Precaution:

.....
.....

(2 marks)

Total 20 marks

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2. The apparatus in **Figure 1** below is set up to investigate the role of an enzyme.

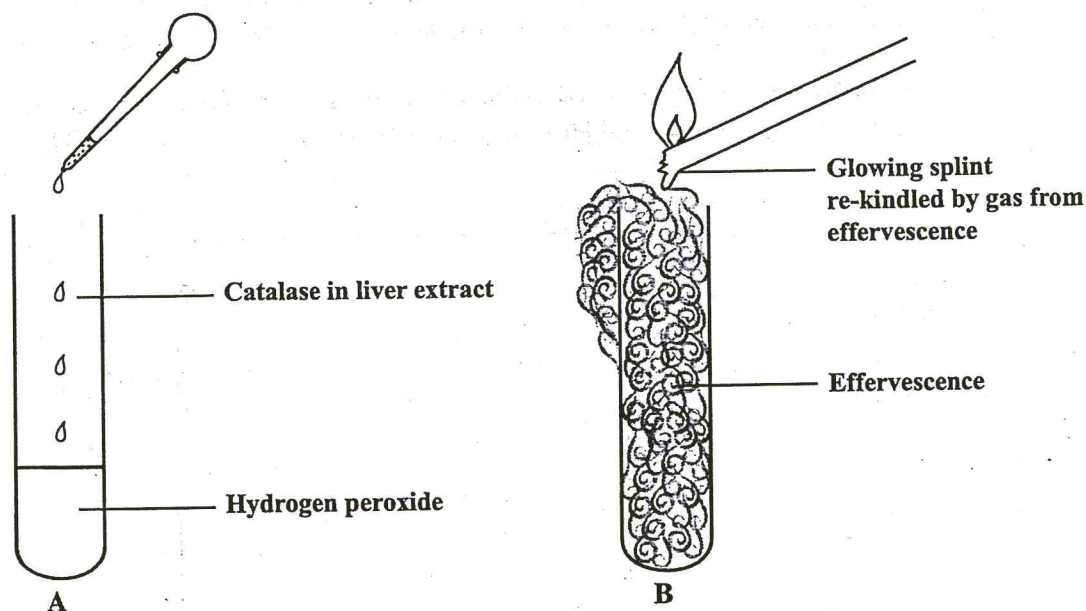


Figure 1. Apparatus to investigate the role of an enzyme

(a) (i) Suggest the specific aim for the investigation in **Figure 1** above.

.....
.....

(2 marks)

(ii) Catalase reacts with hydrogen peroxide to produce a gas which causes the effervescence shown in **Figure 1 B**.

(a) Identify the gas given off in **Figure 1 B**.

.....

(1 mark)

(b) Give ONE reason for the importance of the reaction illustrated in the investigation in **Figure 1**.

.....

(2 marks)

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- (iii) Catalase, the enzyme used in the investigation, was present in the extract obtained from the liver tissue of a mammal.

Suggest how the liver extract might have been prepared for use in the investigation.

.....
.....
.....

(2 marks)

- (iv) Indicate ONE precaution that should be taken in obtaining pure, active liver extract.

.....
.....

(2 marks)

- (b) Salivary amylase is a digestive enzyme that is found in the mouth. Pepsin is a digestive enzyme found in the stomach.

- (i) What are the different conditions in the mouth and stomach, required for maximum activity of amylase and pepsin respectively?

Condition in mouth:

Condition in stomach:

(2 marks)

- (ii) Identify ONE OTHER factor in the mouth and in the stomach that allows salivary amylase and pepsin to function optimally.

.....

(1 mark)

- (iii) Design an experiment to show that different conditions are required by pepsin and amylase for optimal reaction rate. Indicate all materials and apparatus required and fully describe your method.

Apparatus and materials:.....

.....

.....

(2 marks)

Method:.....

.....

.....

.....

.....

(4 marks)

- (c) In another investigation conducted to demonstrate that a gas is a product of respiration in small organisms, the following pieces of apparatus were used.

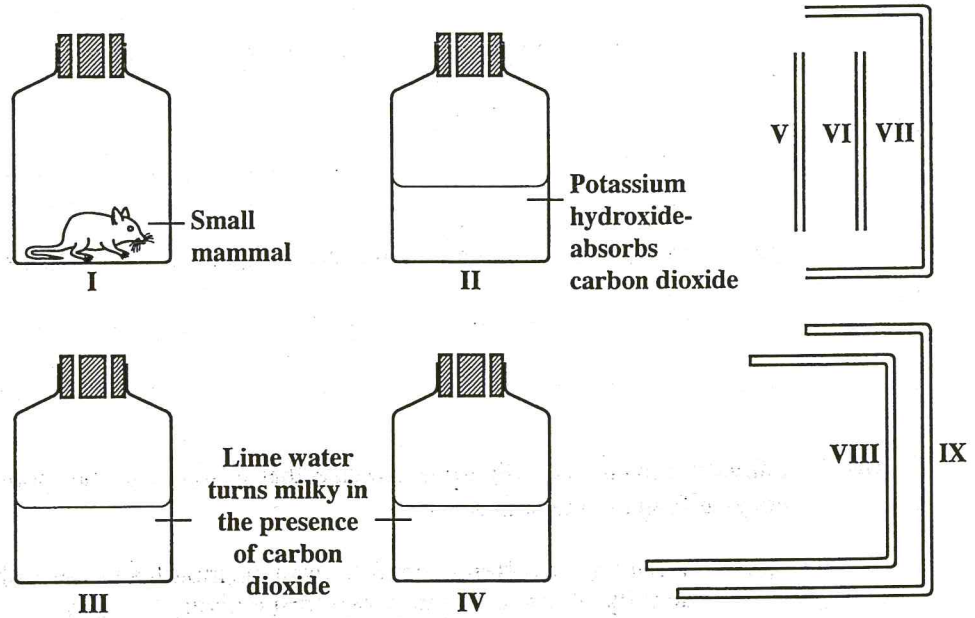


Figure 2. Apparatus and materials used to investigate respiration in a small mammal

- (i) In the space provided below, draw a diagram to illustrate how the nine pieces of apparatus shown in Figure 2 were assembled for the investigation.

(4 marks)

GO ON TO THE NEXT PAGE

- (ii) Suggest an additional piece of apparatus required for the investigation.

.....
(1 mark)

- (iii) Explain the purpose of including potassium hydroxide in the investigation.

.....
.....
(2 marks)

- (iv) Write an aim for this investigation.

.....
.....
(2 marks)

Total 27 marks



The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author details the various methods used to collect and analyze the data. This includes both primary and secondary sources, as well as the specific techniques employed for data processing and analysis.

The third part of the document presents the results of the study. It shows that there is a significant correlation between the variables being studied, which supports the hypothesis. The data indicates that as one variable increases, the other also tends to increase, though there are some fluctuations.

Finally, the document concludes with a summary of the findings and offers some recommendations for future research. It suggests that further studies should be conducted to explore the underlying causes of the observed trends and to test the results in a different context.

The following table provides a summary of the key data points from the study.

Table 1: Summary of Key Data Points

The data shows a clear upward trend in the first variable over the period studied. This is consistent with the theoretical model proposed in the introduction. The second variable shows a similar but slightly less pronounced trend, suggesting a strong but not perfect correlation.

The analysis also reveals that there are several factors that can influence the relationship between the variables. These include external market conditions and internal organizational factors. Understanding these influences is crucial for developing a more comprehensive model.

The results of the study have several practical implications. They suggest that organizations should focus on optimizing the first variable to achieve the best possible outcomes.

In conclusion, the study has provided valuable insights into the relationship between the variables. The findings are robust and support the theoretical framework.

The author would like to thank the following individuals for their assistance and support during the course of the research.

I am also grateful to the funding agency for providing the resources necessary to complete this study.

The author's contact information is provided below for any inquiries.

Thank you for your attention.

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