

FORM TP 2016154



TEST CODE 02207032

MAY/JUNE 2016

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN ADVANCED PROFICIENCY EXAMINATION®

BIOLOGY

UNIT 2 – Paper 032

ALTERNATIVE TO SCHOOL-BASED ASSESSMENT

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of THREE questions. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. You may use a silent, non-programmable calculator to answer questions.
5. You are advised to take some time to read through the paper and plan your answers.
6. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
7. **If you use the extra page(s), you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

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

Copyright © 2014 Caribbean Examinations Council
All rights reserved.

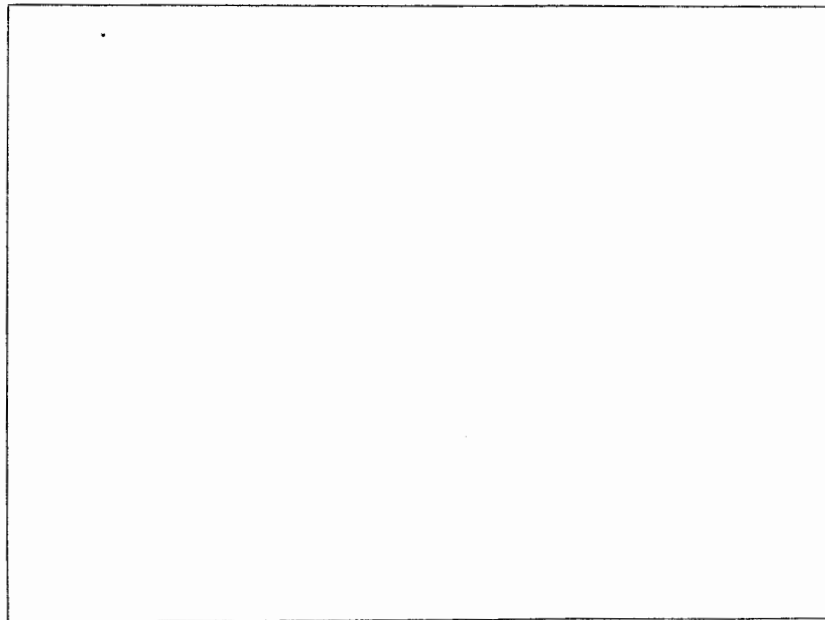
Answer ALL questions.

Write your answers in the spaces provided in this booklet.

1. (a) You are provided with the following apparatus and materials which can be used to investigate whether light is a limiting factor on the rate of photosynthesis.

- 1 beaker, 500 cm³
- 1 funnel
- 1 test tube
- Distilled water
- Pieces of pondweed (*Elodea*)
- A pair of scissors
- Electric lamp
- Stop clock
- Hand-held tally counter
- Spatula
- Sodium hydrogen carbonate powder (sodium bicarbonate)

(i) Assemble the apparatus and materials to conduct a simple experiment to investigate whether light is a limiting factor on the rate of photosynthesis of the pondweed, *Elodea*. In the box below, make a sketch of your experimental set-up.



[3 marks]

GO ON TO THE NEXT PAGE

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

(b) Figure 1 is a diagram showing the structure of a mitochondrion.

(i) Identify the structures labelled X, Y and Z and for EACH state its main function.

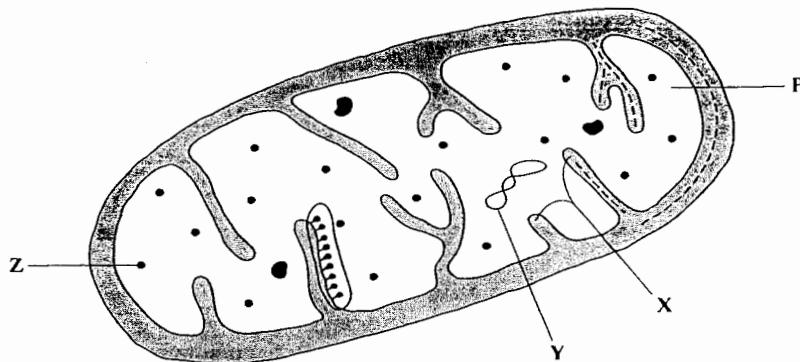


Figure 1. Diagram of a mitochondrion

X

Function

.....

Y

Function

.....

Z

Function

.....

[6 marks]

(ii) Name the major biochemical pathway occurring in the region labelled P.

.....

[1 mark]

Total 16 marks

GO ON TO THE NEXT PAGE

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

2. (a) Figure 2 is a photomicrograph of xylem vessels.

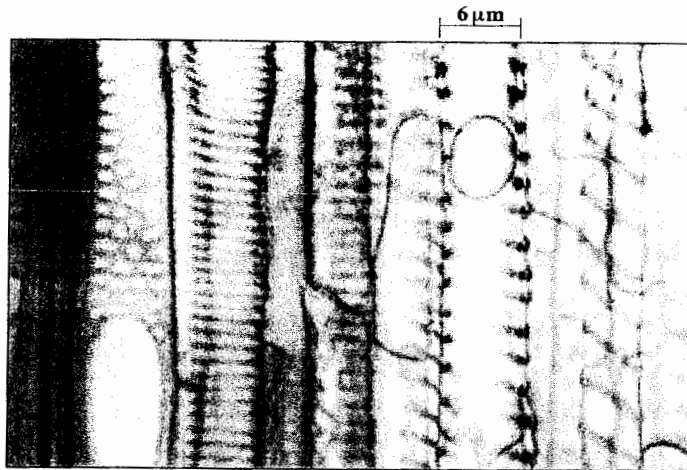


Figure 2. Longitudinal section of xylem vessels

- (i) On Figure 2, use an arrow labelled X to identify a xylem vessel with pitted thickenings, and an arrow labelled Y to identify a vessel with rings or spirals of wall thickenings. [2 marks]
- (ii) State TWO roles of xylem vessels and comment on the importance of the wall thickenings in relation to the stated roles.

Roles

.....

.....

Importance of thickenings

.....

.....

[4 marks]

GO ON TO THE NEXT PAGE

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

- (iii) Examine Figure 2 and comment on ONE **other** observable feature which **may** be considered an adaptation to the roles stated in (a) (ii).

.....

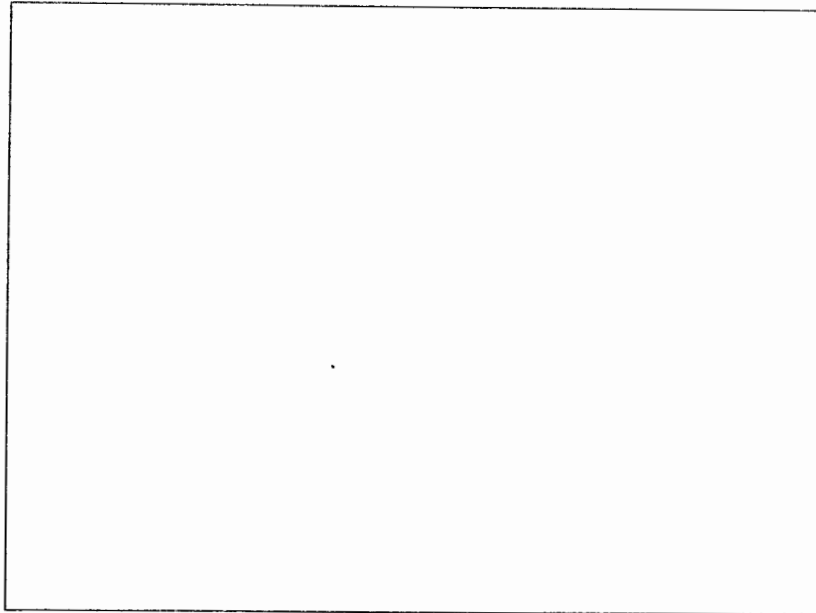
.....

.....

.....

[2 marks]

- (b) Specimen A is a mammalian heart dissected to show its internal anatomy. **In the box below**, make a labelled drawing of the internal structures of the heart.



[5 marks]

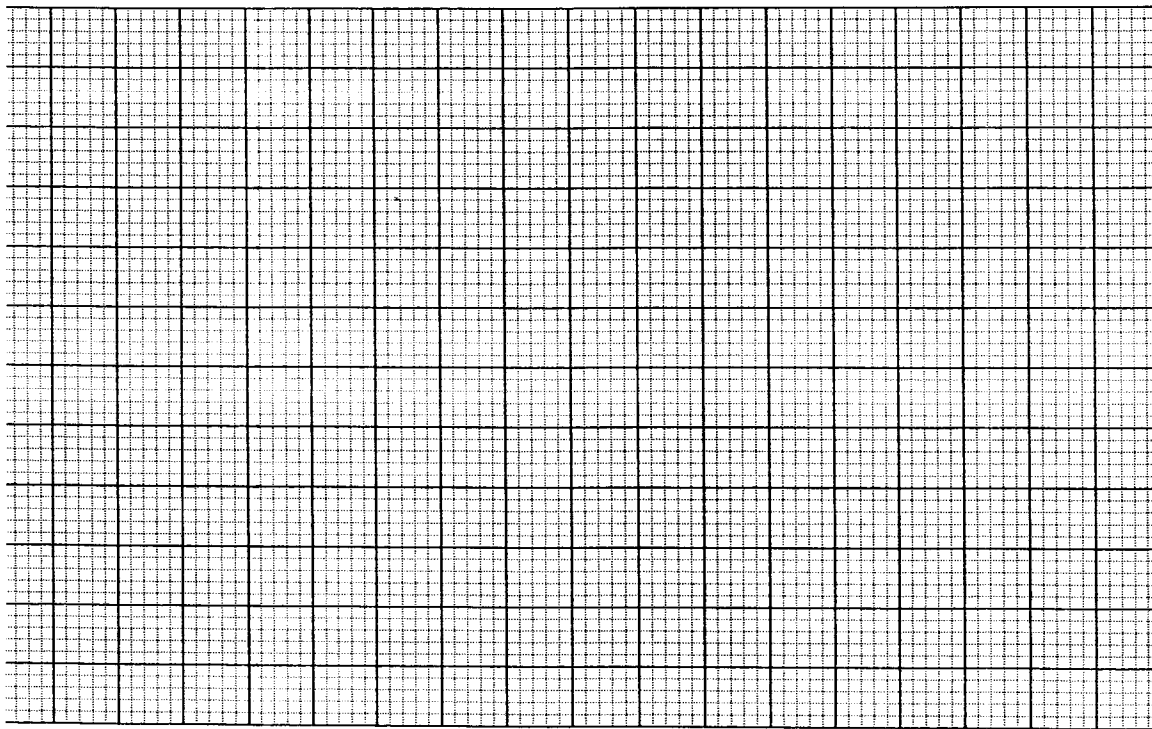
Total 16 marks

3. (a) Table 1 shows the prevalence of obesity in relation to death due to diabetes, for selected Caribbean countries.

TABLE 1: OBESITY PREVALENCE AND MORTALITY RATE FOR DIABETES IN SELECTED CARIBBEAN COUNTRIES

Country	Obesity % Prevalence	Diabetes % Mortality
Trinidad and Tobago	17.5	7
Jamaica	22.5	6
Guyana	22.8	4.5
Belize	28	5
St Kitts and Nevis	30	10

- (i) On the grid provided below, plot a bar graph for the data given in Table 1.



[6 marks]

GO ON TO THE NEXT PAGE

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(ii) Briefly describe the overall trend for the prevalence of **obesity** in the **countries** in Table 1.

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

[2 marks]

(iii) Comment on the nature of the relationship between obesity and **diabetes**, and suggest **TWO** key lifestyle factors associated with the relationship.

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

[2 marks]

