FORM TP 02025054

TEST CODE 01207020

MAY/JUNE 2025

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

BIOLOGY

Paper 02 – General Proficiency

2 hours 30 minutes

583

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions in TWO sections. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. Where appropriate, answers should be illustrated with diagrams.
5. 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.**
6. **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.**

A007

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

Copyright © 2023 Caribbean Examinations Council
All rights reserved.

0 1 2 0 7 0 2 0 0 3

SECTION A

Answer ALL questions.

1. (a) Outline FOUR activities that occur within a seed during germination.

.....

.....

.....

.....

.....

.....

.....

.....

.....

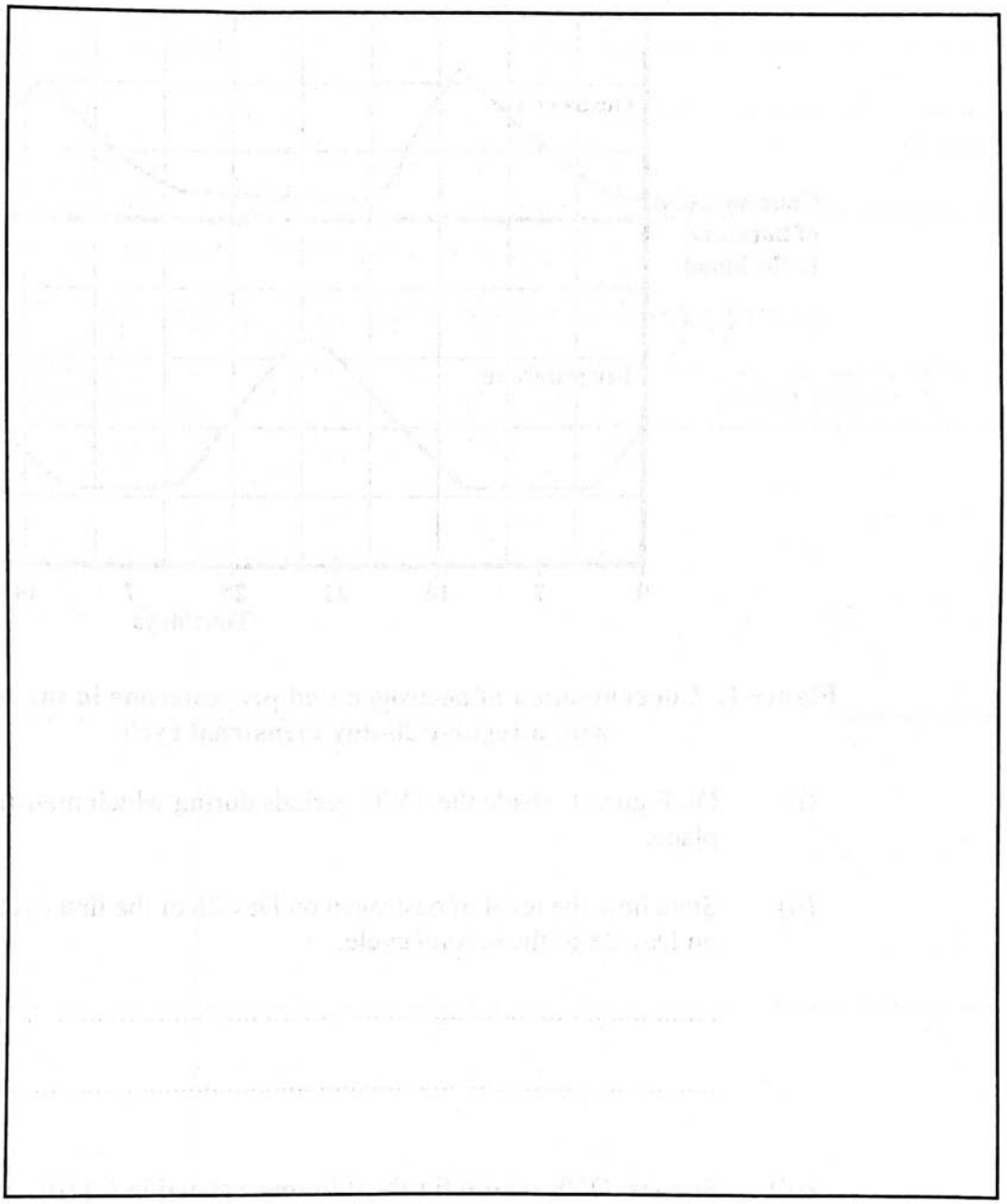
.....

(4 marks)

583

A007

(b) (i) Make a large, labelled diagram to show the internal structures of a dicotyledonous seed.



(6 marks)

(ii) Annotate the diagram drawn in (b) (i). **(3 marks)**

(c) Figure 1 shows the levels of two hormones involved in the human menstrual cycle over a two-month period.

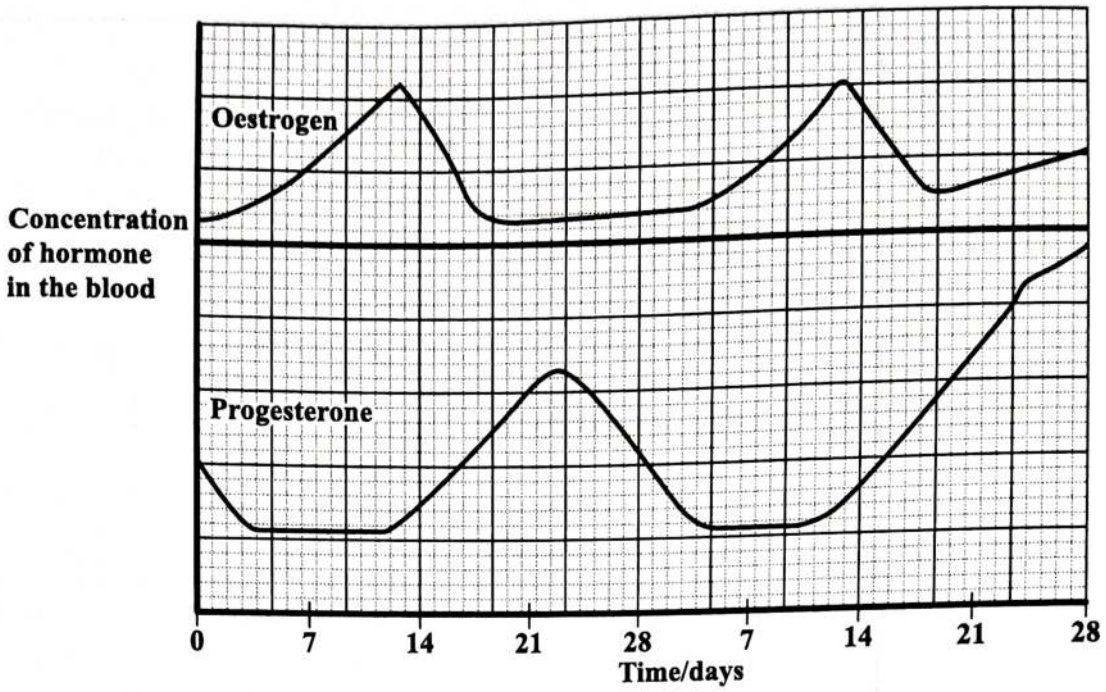


Figure 1. Concentration of oestrogen and progesterone in the blood of a woman with a regular 28-day menstrual cycle

(i) On Figure 1, shade the TWO periods during which menstruation is likely to take place. **(2 marks)**

(ii) State how the level of oestrogen on Day 28 of the first cycle differs from the level on Day 28 of the second cycle.

.....

.....

(1 mark)

(iii) Suggest ONE reason for the difference stated in (c) (ii).

.....

.....

.....

(1 mark)

GO ON TO THE NEXT PAGE

0 1 2 0 7 0 2 0 0 6

(iv) State how the level of progesterone on Day 28 of the first cycle differs from the level on Day 28 of the second cycle.

.....

.....

(1 mark)

(v) Using Table 1 below, compare the two cycles by outlining FOUR comparisons that account for the difference stated in (c) (iv).

TABLE 1: COMPARISON OF THE TWO CYCLES

Comparison	First Cycle	Second Cycle
1		
2		
3		
4		

(4 marks)

GO ON TO THE NEXT PAGE

(d) The following occurrences may take place in the human reproductive system.

(i) Mary's corpus luteum failed to develop after fertilization of her ovum.

(ii) Eight-year-old Ruth had her ovaries removed.

(iii) Bryan's vas deferens was severed.

Complete Table 2 below by suggesting ONE consequence of EACH occurrence.

TABLE 2: OCCURRENCES IN THE HUMAN REPRODUCTIVE SYSTEM AND CONSEQUENCES

	Occurrence	Consequence
(i)	Mary's corpus luteum failed to develop after fertilization of her ovum.	
(ii)	Eight-year-old Ruth had her ovaries removed.	
(iii)	Bryan's vas deferens was severed.	

(3 marks)

Total 25 marks

2. (a) Jan, a high school student, spent several hours each day browsing Facebook and TikTok. She felt increasingly pressured to become as thin as the people she admired while browsing, so she began to take diet pills constantly.

(i) List THREE **social** effects of the abuse of diet pills.

.....

.....

.....

.....

.....

.....

(3 marks)

(ii) Explain ONE way in which the constant use of diet pills may be harmful to Jan's health.

.....

.....

.....

.....

(2 marks)

(b) Name FOUR illegal substances that may be abused by teenagers and young adults.

.....

.....

.....

.....

(4 marks)

GO ON TO THE NEXT PAGE



(c) A study was conducted to investigate the use of diet pills by people in a Caribbean country. The data from the study is shown in Figure 2 below.

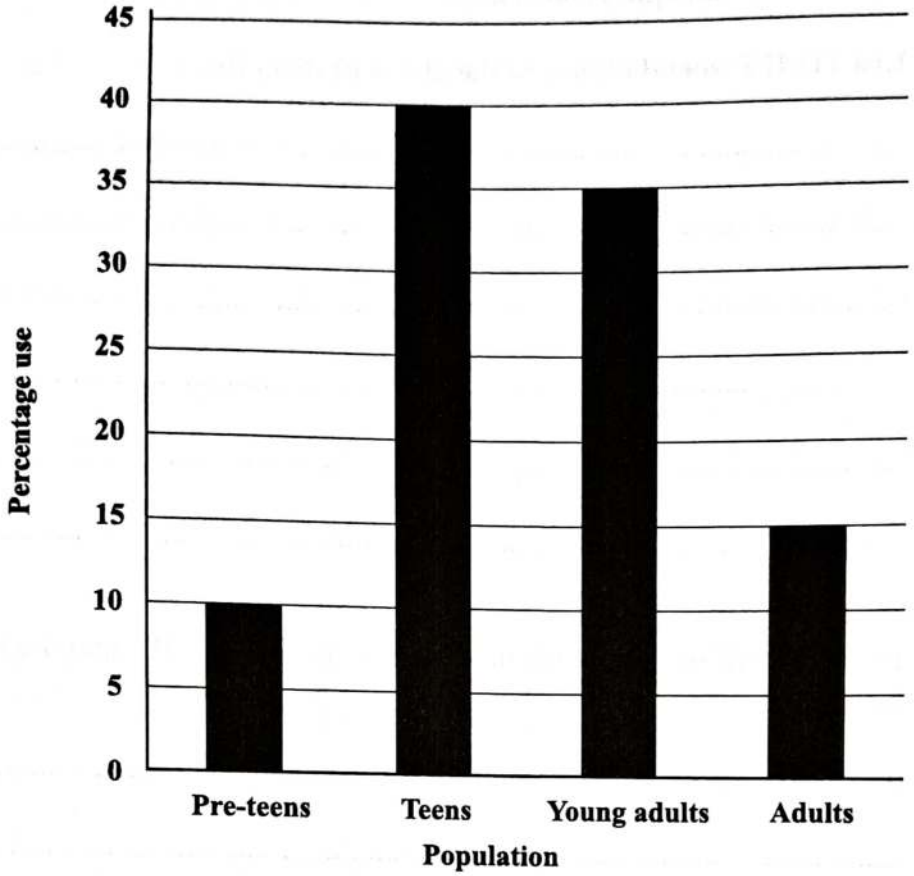


Figure 2. Use of diet pills in a Caribbean country

(i) With reference to Figure 2, which population abused diet pills the MOST?

.....

(1 mark)

(ii) Suggest TWO reasons why the population identified in (c) (i) showed the greatest abuse of diet pills.

.....

.....

.....

.....

(2 marks)

(iii) The Caribbean Community (CARICOM) is concerned about the abuse of diet pills in the Caribbean. Suggest THREE measures that could be put in place to reduce the frequency of use of diet pills in the Caribbean.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(3 marks)

Total 15 marks

3. (a) (i) Name THREE organelles which are ONLY found in plant cells.

.....

.....

.....

(3 marks)

(ii) State the function of any TWO organelles named in (a) (i).

.....

.....

.....

.....

.....

.....

(2 marks)

(b) Outline how the structure of a mitochondrion is suited to its function.

.....

.....

.....

.....

.....

.....

(2 marks)

583

A007

(c) Complete the table below by

(i) describing the expected observations if the indicated cells are placed in EACH of the given types of solution **(4 marks)**

(ii) providing an explanation for the expected observations given in (c) (i). **(4 marks)**

TABLE 3: OBSERVATIONS AND EXPLANATIONS

Cell Type	Solution Type	Expected Observations	Explanation
Animal cell	Concentrated sugar solution		
	Distilled water		
Plant cell	Concentrated sugar solution		
	Distilled water		

Total 15 marks

SECTION B

Answer ALL questions.

4. You are a member of an environmental team that is visiting a landfill that is reaching its capacity for the garbage it can store. The operations manager of the landfill is interested in creating a plan to increase the space and decrease the negative environmental impact of the landfill.

(a) State FOUR challenges associated with the recycling of manufactured products.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

(b) Bacteria present at the landfill break down biodegradable material. Explain ONE possible environmental issue which may occur as a result.

.....

.....

.....

.....

.....

.....

(2 marks)

(c) There is a plan to open an unused section of the landfill. Before trucks begin dumping garbage in the landfill, it is recommended that a study be conducted to identify the species of plants and insects present in the area and also determine how they are distributed.

(i) Suggest ONE technique which may be used to conduct the study.

.....

(1 mark)

(ii) Explain how the technique suggested in (c) (i) may be used to identify the species of plants and insects in the unused section of the landfill.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(3 marks)

583

A007

(d) The plot of land next to the landfill is sloped and a traditional farm is located there.

(i) Name TWO techniques which may be implemented on the farm to reduce soil erosion.

.....

.....

(2 marks)

(ii) Explain to the owner of the farm how ONE named organic farming practice could improve the quality of soil on the farm.

.....

.....

.....

.....

.....

.....

(3 marks)

Total 15 marks

5. (a) Define the following terms.

(i) Allele .....

.....

(ii) Gene .....

.....

(iii) Chromosome .....

.....

(iv) Deoxyribonucleic acid (DNA) .....

.....

(4 marks)

(b) Jamal is a professional dog breeder. He mates selected dogs with the intention of producing dogs with specific characteristics. He recently mated two dogs to produce dogs with desirable coat types. Coat type in dogs is determined by a single gene with two alleles. The straight coat allele is dominant and the silky coat allele is recessive.

(i) Name the process which leads to the production of dogs with desirable coat types.

.....

(1 mark)

(ii) Use a genetic diagram to show the possible offspring which may be produced from a cross between a pure straight coat and pure silky coat dog.

In the box, provide the following information.

Define the alleles. .....

.....

Parents' phenotype .....

Parents' genotype .....

.....

Cross

Outcome

.....

.....

.....

(7 marks)

GO ON TO THE NEXT PAGE

(iii) Dog breeding may not always be advantageous to Jamal. Suggest ONE disadvantage of dog breeding.

.....

.....

.....

(1 mark)

(c) While watching a documentary, Jamal observed that some giraffes in the episode had long necks while others had shorter necks.

(i) Name the process which, over time, led to the appearance of long-neck giraffes.

.....

(1 mark)

(ii) Suggest ONE advantage that the long-neck giraffes would have over those with shorter necks.

.....

.....

.....

(1 mark)

Total 15 marks

6. (a) Figure 3 below is a diagram of the respiratory system. Name the parts labelled A to F.

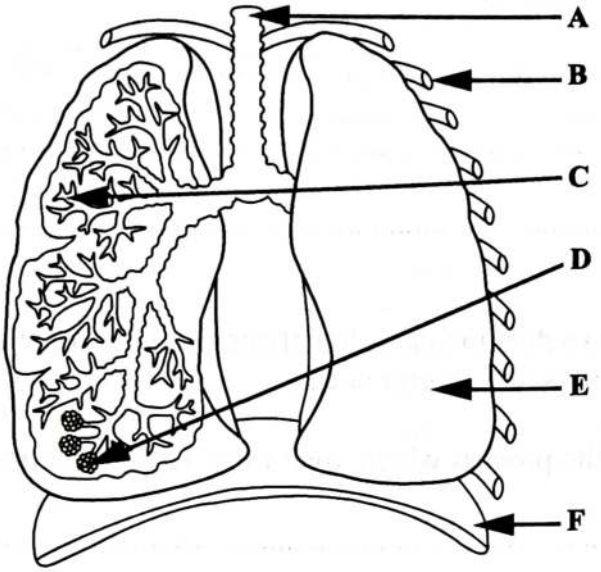


Figure 3. Respiratory system

A .....

B .....

C .....

D .....

E .....

F .....

(6 marks)

(b) Simon has been a smoker for the last five years. He tried to stop smoking last year but was not successful. He recently attended a health fair where he learnt about the negative effects of smoking. He decided to make an appointment with his family physician to discuss what he needed to do to stop smoking.

(i) Outline ONE possible way in which Simon's health may be negatively affected by EACH of any TWO named substances found in cigarettes.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

GO ON TO THE NEXT PAGE

(ii) Suggest ONE reason why Simon may have been unsuccessful when he tried to stop smoking.

.....

.....

.....

(1 mark)

(c) Human beings can exchange oxygen and carbon dioxide because they possess an efficient gaseous exchange surface. Explain how TWO characteristics of the gaseous exchange surface in humans allow for the efficient exchange of oxygen and carbon dioxide.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

Total 15 marks

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.