**FORM TP 2026–002**

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JANUARY 2026

**CARIBBEAN EXAMINATIONS COUNCIL**

**CARIBBEAN SECONDARY EDUCATION CERTIFICATE®**

**EXAMINATION**

# BIOLOGY

**Paper 02 – General Proficiency**

**HYBRID**

***2 hours 30 minutes***

**14 JANUARY 2026 (a.m.)**

**READ THE FOLLOWING INSTRUCTIONS CAREFULLY.**

1. This paper consists of SIX questions in two sections. Answer ALL questions.
2. All responses MUST be written in the answer booklet provided.
3. Your responses MUST be written in English.
4. It is an offence to share your keycode with any other candidate or to log in with another candidate's details.
5. Any attempt to change the configuration of this machine, connect external devices, connect to external networks or to in any way initiate communication with resources other than the URL provided will result in your disqualification, you being shut out of the system and the cancellation of your entire test.

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"*"Barcode Area"*"
Sequential Bar Code

## SECTION A

**Answer ALL questions.**

**Write your answers in the spaces provided in this booklet.**

**1.** (a) Name FOUR sites of food storage in plants. **(4 marks)**

(b) A biology student claims that animals and plants store carbohydrates in the same way because both need energy to survive. Use your knowledge of carbohydrate storage and energy use to explain why this claim is incorrect.

In your answer, refer to the form and location of carbohydrate storage in both types of organisms, how energy is obtained from these stores and why there is a difference in the storage methods for plants and animals. **(4 marks)**

(c) In the boxes in the answer booklet, make large, **annotated drawings** of the transverse section of an artery and a vein. Your drawings should show the **differences** in the four component structures of the artery and vein with respect to their functions. **(9 marks)**

(d) Explain the biological significance of EACH of the following commonly made statements. (A complete explanation must have TWO clear points.)

(i) Transpiration is a necessary evil since the plant loses water continuously via this process. **(2 marks)**

(ii) Phloem cells have very few organelles, yet they are able to transport organic food to all other parts of the plant. **(2 marks)**

(iii) The pulmonary artery and the hepatic artery are both arteries but they function differently. **(2 marks)**

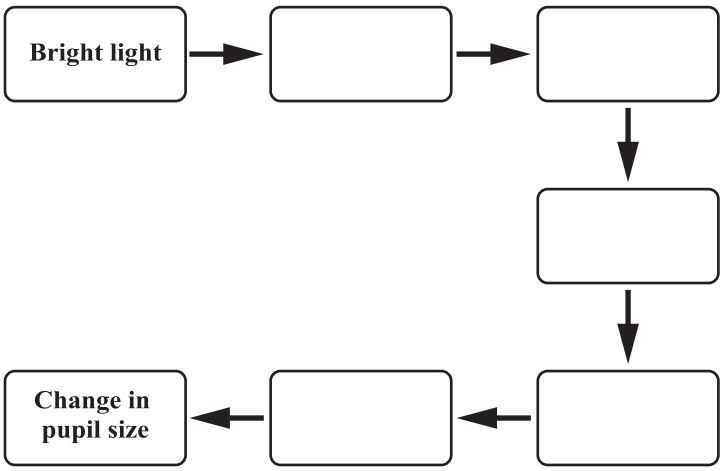
(iv) The left ventricle of the heart is much thicker than the right ventricle. **(2 marks)**

**Total 25 marks**

**2.** (a) (i) Define the term 'reflex action'. **(1 mark)**

(ii) State TWO examples of a reflex action. **(2 marks)**

(b) Complete the following diagram by outlining the reflex arc which occurs when a bright light is shone on a person's eye.




**(5 marks)**

(c) Suraj visited the doctor and when the doctor tapped on his patellar tendon, there was no visible reaction. Suggest a biological reason why there was no jerking of Suraj's knee. **(1 mark)**

(d) Explain why a person blinks when something touches his/her eye. **(2 marks)**

(e) Joy's friend told her that she is 'right brained' since she is very creative and artistic. State ONE reason why this statement is incorrect. **(1 mark)**

(f) Complete Table 1 on **page 10 in your answer booklet** by naming the MAIN part of the brain responsible for the observation outlined. An example has been provided for you.

**TABLE 1: MAIN PART OF THE BRAIN RESPONSIBLE FOR SPECIFIC OBSERVATIONS**

| Activity | Observation | Main Part of Brain Responsible |
|---|---|---|
| Example | Nadia is taking her CSEC Biology exam today. Name the MAIN part of the brain that is responsible for managing and processing what she sees on the Biology paper. | Cerebrum |
| (i) | Halley's comet last appeared in 1986 and is expected to reappear in 2061. Some astronomy students were asked to solve a complex equation of the path of the comet. Name the main part of the brain that would be used to solve the equation. | |
| (ii) | Simone Biles is the most decorated gymnast in history, with 11 Olympic medals and 30 World Championship medals. Name the main part of the brain that she is most dependent on to execute complicated routines on the balance beam. | |
| (iii) | The Panama Canal has been described as one of the largest and most difficult engineering projects ever undertaken. Name the main part of the brain that played a key role in the planning and execution of this great engineering feat. | |
| (iv) | In the human body, the initial effects of cocaine include dilated pupils, high blood pressure and increased heart rate. Name the main part of the brain that is immediately affected by cocaine. | |

**(4 marks)**

**Total 15 marks**

**3.** (a) A biologist made observations of wildlife and their feeding habits within a terrestrial ecosystem. Listed below are the organisms observed and in brackets are the organisms that they feed on.

- Leaves, fruits and seeds
- Caterpillar (Leaves, fruits and seeds)
- Grasshopper (Leaves, fruits and seeds)
- Hawk (squirrel, iguana)
- Iguana (Leaves, fruits and seeds)
- Great crested flycatcher (grasshopper, caterpillar)
- Squirrel (Leaves, fruits and seeds)

(i) Based on the list above, identify TWO primary consumers. **(2 marks)**

(ii) Using the seven organisms observed, draw ONE food web. **(4 marks)**

(iii) Based on the list of organisms provided and the food web drawn in (a) (ii), identify ONE carnivore. **(1 mark)**

(iv) State ONE role of the plant material in the food web. **(1 mark)**

(b) Based on the list given in (a), draw ONE food chain consisting of THREE organisms. **(1 mark)**

(c) (i) Name TWO abiotic factors, **other** than soil moisture and carbon dioxide, that impact living organisms. **(2 marks)**

Abiotic factors play a critical role in the balance of an ecosystem. A biologist recorded the values, from low to high, for two abiotic factors — soil moisture content and carbon dioxide concentration — present in a terrestrial ecosystem over a one-year period. Table 2 shows the data.

**TABLE 2: ABIOTIC FACTORS PRESENT IN THE TROPICAL FOREST**

| | **Soil Moisture Content (% by volume)** | **Carbon Dioxide Concentration (Parts per million)** |
|---|---|---|
| Low | 1 | 390 |
| Normal | 15 | 400 |
| High | 45 | 410 |

(ii) Use the information in Table 2 to explain what would be the result if soil moisture levels were consistently recorded at 62% by volume over a three-week period. **(2 marks)**

(iii) Use the information in Table 2 to explain what would be the result if carbon dioxide levels were consistently recorded above 410 parts per million over a three-week-period. **(2 marks)**

**Total 15 marks**

## SECTION B

**Answer ALL questions.**

**Write your answers in the spaces provided in this booklet.**

**4.** (a) Define EACH of the following terms.

(i) Genetic engineering **(1 mark)**

(ii) Artificial selection **(1 mark)**

(iii) Mitosis **(1 mark)**

(b) State THREE ways in which genetic engineering is used. **(3 marks)**

(c) Explain ONE way in which mitosis is important to living organisms. **(2 marks)**

(d) Farmers visit your biotechnology company to discuss the possibility of producing corn species capable of withstanding drought conditions. They are unsure if they should use artificial selection or genetic engineering for this process.

(i) State ONE way in which genetic engineering and artificial selection are similar. **(1 mark)**

(ii) Complete Table 3 in the answer booklet by providing TWO differences between genetic engineering and artificial selection so that the farmers can make an informed decision. An example has been provided for you.

**TABLE 3: COMPARISON OF GENETIC ENGINEERING AND ARTIFICIAL SELECTION**

| Genetic Engineering | Artificial Selection |
|---|---|
| Genetic engineers create desired traits via gene manipulation to produce the new corn species. | Humans will use corn species that are drought tolerant (capable of withstanding drought conditions) to produce the new corn species. |

**(4 marks)**

(iii) Explain to the farmers ONE ethical **or** ONE ecological implication that they should consider if they decide to use genetic engineering. **(2 marks)**

**Total 15 marks**

**5.** (a) State THREE differences between animal and plant cells **other** than the presence of mitochondria and chloroplasts. **(6 marks)**

(b) A group of researchers discovered a mutation that reduces the number of functional mitochondria in plant cells. Explain how this mutation would affect the function of the plant cell. **(2 marks)**

(c) (i) Explain THREE ways in which diffusion is important to the processes that occur in living organisms. **(6 marks)**

(ii) Outline ONE way in which active transport is important to the processes that occur in living organisms. **(1 mark)**

**Total 15 marks**

**6.** (a) Outline the function of THREE different components of blood. **(6 marks)**

(b) Janice, a nine-year-old girl, cried uncontrollably after she fell off her bicycle while riding. Her outfit was bloodstained due to her having many cuts and bruises.

(i) Within a few minutes of the incident Janice noticed that her cuts were no longer bleeding. She quickly changed her clothes and resumed riding her bicycle. Discuss the biological process which limited Janice's blood loss after she received the cuts. **(4 marks)**

(ii) Janice did not receive appropriate care for her cuts after the incident. A few days later, her mother noticed that two of the cuts had become infected and that the surrounding areas were red and swollen. Suggest TWO methods that could be used to control Janice's infection, to prevent the further worsening of her condition. **(2 marks)**

(c) In 2024, the World Health Organization confirmed that there were persons in the Caribbean who were infected with the West Nile Virus, a disease primarily spread by mosquitoes. Suggest THREE implications for the Caribbean with respect to the presence of this disease. **(3 marks)**

**Total 15 marks**

**END OF TEST**

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