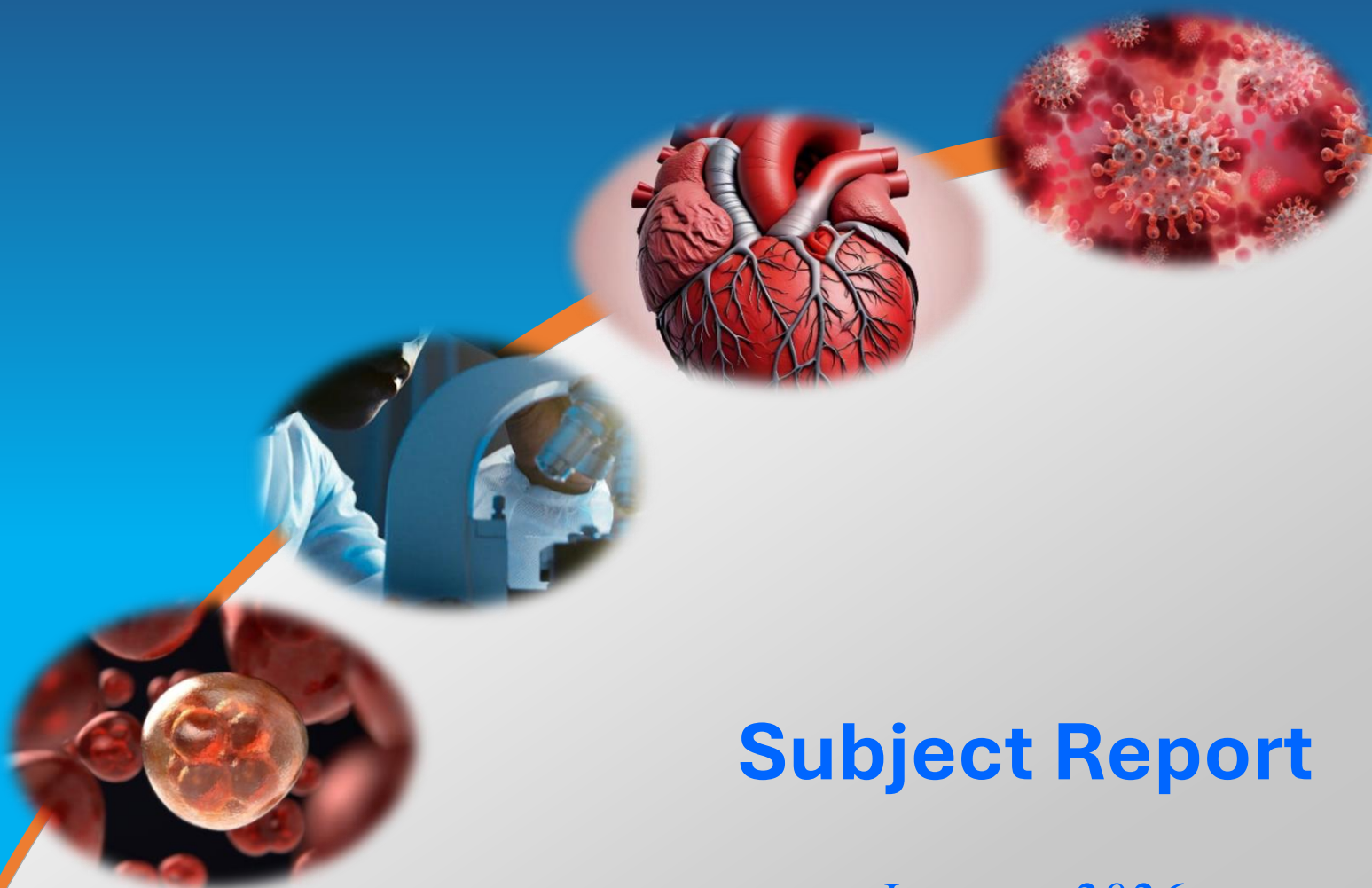




**CARIBBEAN
EXAMINATIONS
COUNCIL**

**CSEC® HUMAN AND SOCIAL
BIOLOGY**



Subject Report

January 2026

C A R I B B E A N E X A M I N A T I O N S C O U N C I L

**REPORT ON CANDIDATES' WORK IN THE
CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION**

JANUARY 2026

**HUMAN AND SOCIAL BIOLOGY
GENERAL PROFICIENCY**

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Table of Contents

INTRODUCTION	1
PAPER 01 — MULTIPLE CHOICE	2
PAPER 02 — STRUCTURED/ESSAY QUESTIONS.....	3
Question 1	3
Question 2	5
Question 3	7
Question 4	9
Question 5	11
Question 6	12
PAPER 032 — ALTERNATIVE TO SCHOOL-BASED ASSESSMENT (SBA)	13
Question 1	13
Question 2	14
Question 3	15
Question 4	16
Question 5	17
Question 6	18
Question 7	19
Question 8	20
Question 9	21
Question 10	22
Question 11	23
Question 12	24
Question 13	25
Question 14	26

INTRODUCTION

This guide has been compiled using candidates' responses to the January 2026 CSEC Human and Social Biology examination. This sitting represented the fourth January administration of the revised syllabus. A total of 584 candidates sat the examination in January 2026, reflecting a decline when compared with 694 candidates in 2025 and 696 in 2024. Of those registered for the examination, 37.49 per cent were absent.

The examination comprises the following papers.

- Paper 01 — Multiple Choice
- Paper 02 — Structured/Essay Questions
- Paper 031 — School-Based Assessment (SBA)
- Paper 032 — Alternative to SBA (private candidates)

Overall, candidate performance declined in 2026, with approximately 40 per cent of candidates achieving acceptable grades (Grades I–III). This represents a decrease when compared with 65 per cent in 2025 and 47 per cent in 2024.

Performance on Profile 1 (Knowledge and Comprehension) showed marginal improvement. The mean score was 43 per cent compared with 41 per cent in both 2025 and 2024. In contrast, a decline in performance was observed for Profile 2 (Use of Knowledge). The mean score was 31 per cent, down from 36 per cent in 2025 and 33 per cent in 2024.

PAPER 01 — MULTIPLE CHOICE

This paper consists of 60 multiple-choice items taken from the three profiles of the syllabus. Paper 01 is worth 30 per cent of the total examination score.

In January 2026, there was a marginal decline in candidates' performance on Paper 01. The mean score was 35.19 out of 60 marks, compared with 35.61 in 2025.

PAPER 02 — STRUCTURED/ESSAY QUESTIONS

This paper comprised a total of six compulsory structured/essay-type questions. Four questions were drawn from Section A and two from Section B. Paper 02 accounts for 50 per cent of the total examination score.

Overall, there was a decline in candidates' performance on this paper. The mean score was 22.07, compared with 32.10 in 2025.

Question 1

Part (a)

In Part (a) (i), most candidates were unable to correctly define the term *genetic engineering*. Many of them described it as 'a process involved in reproduction' while others confused the term with diseases. Some candidates associated genetic engineering with diabetes, suggesting that it provides a cure for the disease. However, they failed to explain that *genetic engineering involves the deliberate modification of an organism's genetic material*.

A few candidates also correctly indicated that genetic engineering involves *altering characteristics by inserting a gene from one organism into the DNA of another*. Overall, candidate responses revealed significant misconceptions regarding both the definition and the process of genetic engineering.

In Part (a) (ii), most candidates were unable to clearly outline how genetic engineering benefits individuals with diabetes. Many candidates demonstrated misconceptions, including the belief that 'genetic engineering reverses or cures the disease' or that it 'provides safer food for diabetic patients'. Although a few candidates attempted to link genetic engineering to the production of insulin, they were unable to accurately explain the process by which this is achieved.

Part (a) (iii) required candidates to identify the vector used to transfer a DNA fragment into a new host during the process of genetic engineering. Most candidates were unable to correctly identify the appropriate vector. Instead, many of them provided inappropriate examples, including organisms such as the '*Aedes aegypti* mosquitoes', 'rats' and 'dogs'. These candidates confused general organisms and specific genetic engineering vectors. Overall, candidates showed a clear lack of understanding of both the role and definition of a vector in genetic engineering.

For Part (a) (iv), candidates were unable to correctly identify the type of protein used to cut DNA into fragments during the process of genetic engineering. Some candidates did not attempt this part while others provided incorrect responses such as 'amino acids', 'chlorophyll' and 'mitosis'. Overall, candidates' responses indicated a limited understanding of the role of enzymes in the genetic engineering process.

Part (b)

In Part (b) (i), most candidates were able to correctly identify *corn* as the crop with the highest percentage of genetically modified (GMO) plants cultivated, based on analysis of the graph provided. The graph illustrated the percentages of GMO and non-GMO crops grown in Country X. Overall, most candidates demonstrated the ability to accurately interpret graphical data and to correctly select the crop with the highest proportion of GMO cultivation.

For Part (b) (ii), most candidates successfully identified *watermelon* as the crop with the lowest percentage of genetically modified (GMO) plants after examining the graph provided. Overall, candidates demonstrated the ability to accurately interpret graphical information and to determine the crop with the smallest proportion of GMO cultivation.

In Part (b) (iii), most candidates were able to identify at least three reasons why farmers may choose to cultivate GMO crops. Common responses included *higher yields, extended shelf-life, larger produce* and *improved nutritional content*. Overall, candidates demonstrated a sound understanding of the potential agricultural and economic benefits associated with the cultivation of genetically modified crops.

In Part (b) (iv), some candidates were able to correctly identify disadvantages associated with the cultivation of GMO crops. Appropriate responses included concerns such as *herbicide resistance, reduced flavour* and *decreased consumer demand due to perceptions that GMO products may be harmful to health*. However, other candidates were unable to provide accurate disadvantages, instead offering erroneous responses such as ‘bacterial and fungal growth’ or ‘fluctuations in crop prices’, which did not directly address issues specific to genetically modified crops. Overall, responses reflected a mixed understanding of the potential disadvantages of GMO cultivation.

For Part (b) (v), many candidates were able to correctly identify the primary societal benefit of cultivating GMO crops. Common responses highlighted contributions to food security and improvements in the health and nutrition of the population. However, some candidates incorrectly identified increased profitability or financial gain as the main benefit, indicating a misunderstanding of the broader societal purpose of GMO cultivation.

Question 2

Part (a)

Although the instructions for Part (a) (i) specified that responses should include letter labels only, a few candidates provided the names of the organs. In addition, some candidates struggled to correctly identify the organ responsible for the secretion of fight-or-flight hormones.

For Part (a) (ii), despite similar instructions requiring letter labels only, a few candidates again responded by providing the names of organs. However, in comparison with Part (a) (i), more candidates were able to correctly identify the organ associated with the production of hormones responsible for the development of secondary sexual characteristics.

Part (b)

In Part (b) (i), many candidates struggled to identify valid similarities between the two systems. Some candidate responses were too broad or vague to be credited. For example, candidates mentioned both systems being part of the human body or that both involved the brain.

In Part (b) (ii), candidates generally demonstrated an understanding that the two systems were different; however, many experienced difficulty using a single criterion to express a difference. Instead, some candidates described differences by referring to separate criteria for each system, rather than making a direct comparison. The speed of response was the criterion most frequently used to distinguish between the two systems.

Part (c)

For Part (c) (i), most candidates were unable to correctly identify the hormone labelled A. Candidates incorrectly identified the hormone as 'FSH' instead of *LH*. Very few candidates responded correctly to Part (c) (ii). Responses indicated that candidates did not understand the relationship between the production of Hormone B and Hormone A, as illustrated in Figure 3.

In Part (c) (iii), although many candidates were unable to correctly identify Hormone B, many of them still attempted to describe the effects of the hormone on the reproductive system when it is produced in insufficient amounts. Among candidates who correctly identified Hormone B, *oestrogen* was the most frequent response. The most commonly stated effect of insufficient oestrogen was an *irregular menstrual cycle*. Some candidates, however, lost marks for describing effects on pregnancy or for stating effects associated with normal hormone levels rather than the effects of insufficient levels.

Part (d)

Part (d) (i) was poorly done, as many candidates were unable to recognize Figure 4 as a complete ovarian cycle ending in menstruation. A common incorrect response was 'ovulation', indicating confusion regarding the stages of the ovarian cycle.

Part (d) (ii) was also poorly done. Many candidates incorrectly stated that fertilization had occurred, often reasoning that implantation was about to take place or that the egg had met the sperm. Even among candidates who correctly stated that fertilization had not occurred, explanations were frequently unrelated to the information presented in Figure 4. Additionally, some candidates mistakenly identified the corpus luteum as an ovum.

Question 3

Part (a)

In Part (a) (i), many candidates demonstrated accurate recall of the required term, *excretion*. This suggests that candidates possess a sound understanding of fundamental biological terminology related to waste removal, with only minimal misconceptions observed.

For Part (a) (ii), most candidates correctly identified either the *skin* or *the lungs* as organs involved in the removal of metabolic waste. Some candidates provided incorrect responses, including organs not directly involved in excretion. Overall, responses to this question indicate that most candidates understand that multiple organs contribute to the removal of metabolic waste.

In Part (a) (iii), candidates who selected the skin demonstrated an understanding that *sweat contains small amounts of metabolic waste such as urea and mineral salts*. Those who selected the lungs showed awareness that *carbon dioxide, a metabolic waste product of respiration, is removed from the body through exhalation*. Additionally, some candidates correctly identified the *kidney* as an excretory organ and stated *urea* as its primary excretory product.

Part (b)

In Part (b) (i), candidates were generally able to correctly identify at least one of the labelled structures. Candidates were better able to identify Structure X (glomerulus) than Structure Y (distal convoluted tubule). While candidates demonstrated a basic understanding of major nephron structures such as the glomerulus, there was limited familiarity with more specific components, particularly the distal convoluted tubule. The use of vague terminology, such as 'second tubule', suggested partial recognition of the structure rather than precise anatomical knowledge.

In Part (b) (ii), most candidates were unable to provide accurate or complete explanations. Some responses were vague or unrelated and did not directly address the process occurring at X. This indicates limited understanding of ultrafiltration and how the process is influenced by changes in blood pressure.

In Part (b) (iii), many candidates used acceptable synonymous terms such as *increase*, *be greater* or *rise*, all of which were credited. Some candidates either left the question unanswered or provided vague responses that did not clearly indicate an increase in filtrate volume. A few candidates appeared uncertain about the relationship between blood pressure and filtration rate. Overall, responses suggest that most candidates understood the effect of high blood pressure on glomerular filtration.

Part (c)

Overall, performance on this question was poor. Very few candidates provided a comprehensive explanation that addressed the required changes. Consequently, the maximum score attained was two out of the four available marks. Some candidates who earned marks for the question correctly referred to *the secretion of antidiuretic hormone (ADH) and indicated that increased ADH secretion results in greater reabsorption of water in the kidney tubules*. However, many candidates experienced difficulty linking environmental conditions, such as excessive sweating, to hormonal control mechanisms and the resulting physiological responses.

Part (d)

In Part (d) (i), many candidates were unable to provide the correct response. Very few accurately identified *renal dialysis as the procedure used to perform the major functions of the kidney when it is diseased*. The most common incorrect response was ‘kidney transplant’. These responses suggest that while candidates may be generally aware of treatment options for kidney disease, they lack a clear understanding regarding the specific function of renal dialysis. Additionally, confusion was evident with respect to the surgical replacement of an organ (transplant) and a medical procedure that artificially carries out kidney functions (dialysis).

In Part (d) (ii), most candidates demonstrated a basic understanding of risk factors associated with kidney disease, with some correctly identifying at least one valid factor — *smoking*. However, many candidates incorrectly cited insufficient water intake as a major cause of kidney disease. This suggests an incomplete understanding of the distinction between general health practices and clinically recognized long-term risk factors for chronic kidney disease.

Question 4

Part (a)

In Part (a) (i), it was evident that there were misconceptions regarding the differences between Type 1 and Type 2 diabetes. Candidates focused primarily on blood glucose levels rather than on whether insulin is produced by the pancreas. As a result, only a few candidates were able to correctly distinguish the fundamental causes of each condition. In particular, candidates showed limited understanding that *Type 1 diabetes results from the body's inability to produce insulin whereas Type 2 diabetes is primarily due to insulin resistance or the ineffective use of insulin by body cells.*

In Part (a) (ii), most candidates were able to correctly identify common signs and symptoms of diabetes, including excessive thirst, frequent urination, fatigue, slow wound healing and elevated blood glucose levels. However, none of the candidates identified the presence of glucose in the urine as a symptom, indicating a gap in understanding. Additionally, some candidates listed both weight gain and weight loss without clarification, resulting in contradictory responses and suggesting uncertainty about how symptoms may vary depending on the type and progression of the disease.

In Part (a) (iii), most candidates were able to identify lifestyle diseases, with common responses including cardiovascular diseases such as *heart attacks, obesity and certain types of cancer.* However, very few candidates recognized *cirrhosis of the liver resulting from excessive alcohol consumption as a lifestyle-related disease.* Some candidates also confused risk factors, lifestyle practices and diseases, indicating a lack of clear understanding of the distinction between causes and resulting medical conditions.

Part (b)

In Part (b) (i), most candidates were able to state that *a heart attack results from a clot in an artery, leading to reduced blood flow to the heart muscle.* However, candidates rarely used appropriate biological terminology, such as *atherosclerosis* or *arteriosclerosis*, in their explanations. While some candidates mentioned plaque deposition in the arteries, they did not adequately explain the underlying causes of plaque formation, such as the accumulation of cholesterol and fatty substances on the arterial walls. This indicates a superficial understanding of the pathological process leading to a heart attack.

In Part (b) (ii), most candidates were able to recognize that *damage to sensory neurons would affect the transmission of pain impulses from the heart.* However, responses were often incomplete, as candidates failed to explain the role of relay neurons in transmitting impulses within the central nervous system for interpretation. Many candidates failed to state that damage to the sensory neuron would prevent the impulse from being transmitted to the brain, thereby preventing the interpretation and perception of

chest pain. Candidates' responses indicated limited understanding of the coordinated roles of different neurons in the transmission and interpretation of nerve impulses.

Part (b) (iii) was generally well answered, with most candidates correctly identifying appropriate measures to reduce the risk of a subsequent heart attack. Acceptable responses included *regular exercise, reducing the intake of salt, sugar, and fatty foods, and attending regular medical checkups*. Some candidates lost marks for providing vague responses such as 'improve lifestyle' or 'make better lifestyle choices', which were not credited. Candidates were required to state specific and practical measures. Such responses highlighted the need for greater emphasis on precision and detail in responses.

Question 5

Part (a)

In Part (a) (i), most candidates were unable to correctly outline one difference between active and passive transport. An acceptable response was that *active transport requires energy and involves movement from an area of low concentration to an area of high concentration*. Many candidates incorrectly stated that ‘active transport occurs constantly while passive transport occurs passively’, demonstrating a misunderstanding of the processes involved.

In Part (a) (ii), very few candidates correctly identified that *the characteristics necessary for efficient gaseous exchange include a thin, moist membrane, a large surface area to volume ratio and a rich blood supply*. While some candidates mentioned a large surface area, they failed to explain its relationship to volume, which is essential for efficient gas exchange.

Part (b)

In Part (b) (i), few candidates were able to identify regions other than the small intestine where nutrient absorption occurs and to provide appropriate examples of nutrients absorbed in these regions. Many candidates were unable to state that *the stomach absorbs substances such as glucose and that the large intestine absorbs water, B vitamins and minerals*.

In Part (b) (ii), most candidates were unable to explain how the small intestine is adapted for the efficient absorption of nutrients. Many responses failed to mention *the presence of finger-like projections called villi, on which microvilli are found, both of which serve to increase surface area for absorption*. Few candidates noted that the thin wall of the villus facilitates easier absorption. Instead, most candidates gave general descriptions of nutrients entering the bloodstream without explaining how the structural adaptations of the villi support this process.

In Part (b) (iii), most candidates were unable to discuss the importance of a system other than the small intestine in the transport of materials. Candidates were expected to refer to the circulatory system and the substances it transports, such as *nutrients, gases, hormones, metabolic wastes, white blood cells and platelets for blood clotting*. Many candidates discussed other systems, including the respiratory, nervous, or excretory systems, focusing only on their general functions rather than their role in material transport.

Question 6

Part (a)

Most candidates performed poorly on Part (a) (i). The question required them to identify the initial process that was occurring in a water treatment plant. Candidates frequently misidentified the process as 'sedimentation' or 'filtration' rather than *screening*.

Performance on Part (a) (ii) was extremely poor. Many candidates confused the process of aeration with sedimentation or seemed to misunderstand the purpose of aeration. There was rarely any mention of the role of bacterial activity and only a few candidates earned marks for correctly stating that *oxygen is introduced into the aeration tank*.

In Part (a) (iii), very few candidates were able to accurately identify the by-products of the wastewater treatment process. Most candidates simply stated 'gas' and 'sludge' for By-product 1 and By-product 2 respectively. Many other responses were vague or lacked the required level of specificity.

Part (b)

In Part (b) (i), most candidates were able to identify at least two of the three negative impacts that the introduction of sewage would have on the marine ecosystem. However, many candidates experienced difficulty explaining how sewage caused the negative effects identified. Terms such as 'pollution' and 'toxin' were frequently used in reference to chemical poisoning rather than the biochemical processes involved in eutrophication or pathogenic infection.

In Part (b) (ii), most candidates performed well, correctly identifying at least two of the three measures that the government could implement to protect beach users and the ecosystem. Candidates performed best on this part of the question.

FURTHER COMMENTS

Candidates are encouraged to consult the syllabus and to pay close attention to the specific objectives outlined for each topic.

PAPER 032 — ALTERNATIVE TO SCHOOL-BASED ASSESSMENT (SBA)

Paper 032, the Alternative to School-Based Assessment (SBA), is an examination offered to private candidates. The examination attempts to simulate the skills tested in the SBA. This is achieved through the use of compulsory questions based on a case study. The mean score for this paper was 14.27 compared with 19.84 in 2025.

Question 1

Generally, candidates failed to provide a complete statement of the problem. While many of them were able to identify that the students were overweight, they did not correctly state the probable cause of the condition observed. Additionally, several candidates did not identify a problem statement.

Question 2

Candidates were unable to correctly state the aim of the investigation. Many did not effectively use the information provided in the case study to identify the research objective. While some candidates recognized that the investigation involved body mass index (BMI), they failed to link BMI with the consumption of chicken and chips, which was central to the investigation.

Question 3

Most candidates were unable to correctly identify the sample based on the information provided in the case study. Many incorrectly identified methods of data collection as the sample. Although some candidates recognized that the sample involved a group of students, they were not sufficiently specific, failing to indicate that *the students were drawn from the fifth form year group*.

Question 4

Candidates were unable to correctly identify the method of data collection used in the investigation. Many of them incorrectly stated that the method involved 'questionnaires', 'interviews', or 'research', rather than recognizing that data were collected through measurements of height and weight.

Question 5

Most candidates were unable to correctly identify appropriate precautions that should have been taken during data collection. Candidates' responses were often vague and did not directly relate to the data collection process. Common incorrect responses included 'obtaining parental permission', 'concerns about students' self-esteem' and 'invasion of privacy'.

A valid response indicated that *students should have been screened for pre-existing conditions that may have contributed to them being overweight.*

Question 6

Many candidates were unable to correctly identify the limitations of the investigation, indicating a lack of understanding of what constitutes a limitation in a research context. An appropriate limitation would have been that the sample size was too small.

Question 7

Most candidates were able to correctly complete the table using the given data. However, a few candidates incorrectly used body mass index (BMI) values to complete the table. In addition, some candidates failed to transfer all the required information from Table 3 on the question paper to the blank table on the answer sheet, instead completing only the missing values.

Question 8

Many candidates were unable to score full marks for the graphical representation. Some failed to provide an appropriate title for the graph. In addition, axes were often not labelled or appropriate values were not included, which affected one or both axes.

Several candidates did not use the scale provided when constructing the bar graph. Some graphs also lacked a key to distinguish between students who ate chicken and chips and those who did not. Additionally, a few candidates incorrectly combined the values for both groups and represented them using a single bar rather than separate bars.

Question 9

Many candidates were unable to identify an alternative method of presenting the data. The most frequently suggested method was a line graph, which was not appropriate for the data provided. Some candidates incorrectly described methods of data collection rather than methods of data presentation, while others suggested presenting the data in the form of a speech. The appropriate response was that *the data could have been presented using a pie chart.*

Question 10

Candidates needed to be more specific when stating findings based on the data presented in the bar chart. Some candidates provided information not supported by the data, offering personal opinions instead. Nevertheless, most candidates were able to correctly identify at least one valid finding from the bar graph.

Question 11

Part (a)

Some candidates were unable to fully explain why the diet was considered unhealthy. While many candidates identified that the diet was *high in fats and carbohydrates*, they failed to also indicate that it was *deficient in fruits and vegetables*.

Candidates also had difficulty recognizing that not all food groups were present and that those included were not in the correct proportions. In addition, some candidates inappropriately used information that was required for Part (b) when responding to Part (a).

Part (b)

Many candidates were able to identify the effects of the long-term consumption of an unhealthy diet with respect to the development of non-communicable diseases. However, some responses indicated a lack of understanding of what constitutes a non-communicable disease.

Question 12

Part (a)

Candidates were generally able to suggest plausible reasons why a student who did not eat chicken and chips was overweight. However, many candidates incorrectly identified genetics or genes as the cause, which was not accepted.

Part (b)

Candidates were able to state valid reasons why a student who ate chicken and chips was not overweight. This part was well done, with most candidates correctly suggesting that *students who consumed chicken and chips but were not overweight may have had high metabolic rates*.

Question 13

Generally, candidates were able to identify ways in which students could be encouraged to choose healthier diets. However, some candidates focused on strategies to prevent weight gain rather than specifically addressing healthy dietary choices. Others emphasized aspects of a healthy lifestyle, such as 'exercise', instead of concentrating on the consumption of healthy foods.

Question 14

Most candidates were unable to draw a conclusion based on the results of the investigation. Instead, conclusions were often based on personal opinions rather than on the evidence provided in the case study.

FURTHER COMMENTS

Candidates require additional practice with respect to the various components assessed in Paper 032. They should be given opportunities to identify problems within their school environment and to formulate clear and appropriate problem statements based on these observations. From these problem statements, candidates should also practise developing suitable and focused research objectives.

Candidates must be able to identify different types of samples from which data may be collected. They should also be familiar with the various methods of data collection and be able to select the most appropriate method for a given investigation.

In addition, candidates should be given further practice in presenting data using different types of graphs and should be guided on the correct procedures for the construction of graphs, including appropriate scaling and the proper labelling of axes.

When drawing conclusions, candidates must ensure that their conclusions are based on the data collected and presented. They should also be guided in ensuring that conclusions are clearly linked to the stated research objectives.