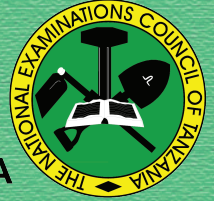


THE UNITED REPUBLIC OF TANZANIA  
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY  
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



**CANDIDATES' ITEM RESPONSES ANALYSIS  
REPORT ON THE ADVANCED CERTIFICATE OF  
SECONDARY EDUCATION EXAMINATION  
(ACSEE) 2025**

**COMPUTER SCIENCE**



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**(ACSEE) 2025**

**136 COMPUTER SCIENCE**

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## FOREWORD

The National Examinations Council of Tanzania is pleased to issue the Candidates' Item Responses Analysis (CIRA) report on Computer Science in the Advanced Certificate of Secondary Education Examination (ACSEE) 2025. This analysis aims to provide feedback to students, teachers, parents, policy makers and other education stakeholders on how candidates responded to the examination questions.

Generally, the candidates' performance in the 2025 Computer Science Examination was good as 96.19 per cent of the candidates passed. The analysis of performance in each topic shows that, the candidates had good performance in nine topics and weak performance in one topic. The candidates performed well in the topics of *Computer Security and Privacy, Data Communication and Networking, C++ Programming, Computer Basics, IT Environment, Data Structure and Algorithms, Website Development, Visual Programming* and *Data Representation*. The candidates' performance was weak in the topic of *Systems Development*. The weak performance in this topic is attributed to the candidates' failure in understanding the requirements of the questions, lack of knowledge about the key personnel involved in system development and their roles.

The National Examinations Council expects that the feedback provided in this report will help the education administrators, school managers, teachers, parents and students to identify proper measures for improving the candidates' performance in future examinations administered by the Council.

Finally, the Council would like to thank the examination officers and all who participated in the preparation of this report.



Prof. Said Ally Mohamed  
**EXECUTIVE SECRETARY**

## 1.0 INTRODUCTION

This report presents an analysis of the candidates' performance in the 2025 Advanced Certificates of Secondary Education Examination (ACSEE) for the Computer Science subject. The examination assessed the level of knowledge and competencies gained by the candidates during their advanced secondary education.

The examination consisted of two papers: Computer Science Paper 1 (Theory) and Computer Science Paper 2 (Practical). The theory paper had sections A and B. Section A consisted of 7 compulsory questions, each worth 10 marks. Section B had 3 optional questions, each worth 15 marks. Candidates were required to answer 2 questions. The practical paper had 3 questions, each carrying 25 marks. The candidates were required to answer 2 questions, including question one.

A total of 210 candidates sat for the Computer Science examination in 2025. Out of whom, 202 (96.19%) passed and 8 (3.81%) failed. In 2024, a total of 195 candidates sat for the examination, of which 185 (94.87%) passed and 10 (5.13%) failed. This indicates that the performance increased by 1.32 per cent.

The analysis of the candidates' performance in each question considered the question requirements, the nature of candidates' responses, and the common error made during attempting the questions. Performance was categorized into three levels based on score interval: 0 - 34 (weak performance), 35 - 59 (average performance), and 60 - 100 (good performance). These intervals represent the percentage of candidates who scored 35 percent or above of the marks allocated to different questions. The candidates' performance is also presented through charts. Under these charts, the red color denotes weak performance, yellow denotes average performance, and green denotes good performance. The Extracts from both good and weak candidate responses have been included to demonstrate actual examples of candidate performance. Finally, the report concludes with a summary of findings and relevant recommendations.

## 2.0 ANALYSIS OF THE CANDIDATES' RESPONSES PER QUESTION

### 2.1 136/1 Computer Science 1

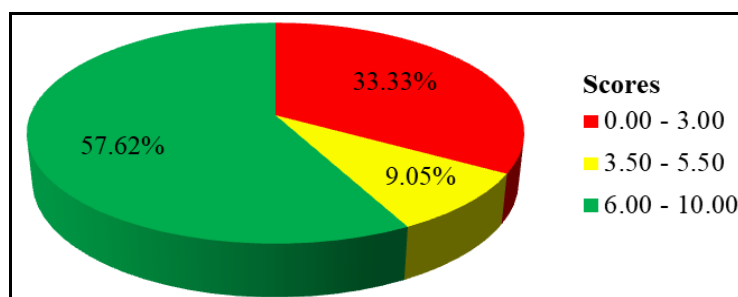
This was a theory paper which lasted for 3 hours. The paper consisted of sections A and B, with a total of 10 questions. Section A consisted of 7 short-answer questions, each carried 10 marks. Section B contained three essay/structured questions, whereas each question carried 15 marks. Candidates were required to answer all questions in Section A and any two questions from Section B, making a total of nine questions to be answered.

#### 2.1.1 Question 1: Data Representation

This question had three parts: (a), (b) and (c). The question was as follows:  
*The Dar es Salaam Rapid Transit (DART) company wants to install a new smart system that the passenger can use coins and smart cards to get access. The planned system is expected to operate in discrete mode using two inputs either a passenger and coin or a passenger and smart card. Perform the following tasks required in designing the new DART system:*

- (a) *Create a truth table that represents the DART new smart system.*
- (b) *Use the truth table constructed in 1(a) to generate a simplified Boolean expression.*
- (c) *Draw the logic gate circuit for the simplified Boolean expression in 1 (b).*

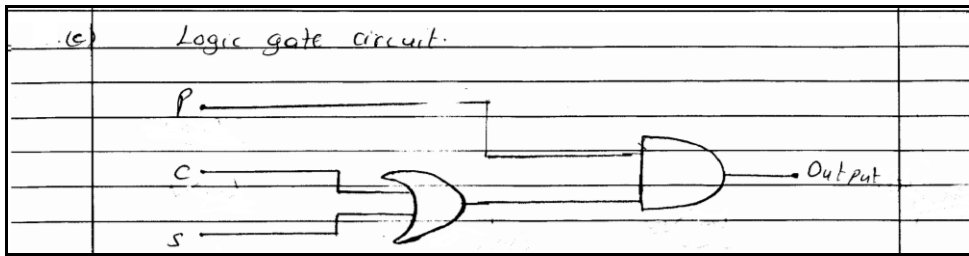
A total of 210 (100%) candidates attempted this question. Out of whom 70 (33.33%) scored from 0 to 3 marks, 19 (9.05%) scored from 3.5 to 5.5 marks, while 121 (57.62%) scored from 6 to 10 marks out of 10 marks allocated. Figure 1 illustrates the candidates' performance on this question.



**Figure 1:** *The Candidates' Performance on Question 1 of Paper 1*

The general performance on this question was good as 66.67 per cent of the candidates scored above 3 marks. The analysis done on the candidate responses showed that (57.62%) of the candidates scored high marks. These candidates correctly identified all required inputs and constructed the truth table in part (a). In part (b), they were able to generate and simplify the Boolean expression from the truth. However, a few of them, failed to apply the correct Boolean algebra laws to simplify the expression. Others faced difficulties to finish simplification of expression which led them to draw irrelative logic circuit. In part (c), some of these candidates correctly drew logic gates diagram. This shows that, these candidates had sufficient knowledge of data representation. Extract 1.1 presents a sample of the correct responses from one of the candidates.

1(a)	let p represent the passenger. c represent the coin s represent the smart card.																																														
	TRUTH TABLE:																																														
	<table border="1"> <thead> <tr> <th>P</th> <th>C</th> <th>S</th> <th>OUTPUT</th> <th></th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td></td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td></td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td></td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td></td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td><math>(P\bar{C}S)</math></td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td><math>(PC\bar{S})</math></td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td><math>(PCS)</math></td> </tr> </tbody> </table>	P	C	S	OUTPUT		0	0	0	0		0	0	1	0		0	1	0	0		0	1	1	0		1	0	0	0		1	0	1	1	$(P\bar{C}S)$	1	1	0	1	$(PC\bar{S})$	1	1	1	1	$(PCS)$	
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1	1	0	1	$(PC\bar{S})$																																											
1	1	1	1	$(PCS)$																																											
(b)	Boolean expression: $P\bar{C}S + PC\bar{S} + PCS$																																														
	$P\bar{C}S + PC\bar{S} + PCS$ $P[\bar{C}S + C\bar{S} + CS]$ - - - - - Distribution law $P[\bar{C}s + c(\bar{s}+s)]$ - - - - - Distribution law $P[\bar{C}s + c(1)]$ - - - - - Compliment law $P[\bar{C}s + c]$ - - - - - Identity law. $P[(\bar{C}+c) \cdot (s+c)]$ - - - - - Distribution law. $P[(1) \cdot (s+c)]$ - - - - - Compliment law $P[s+c]$ - - - - - Identity law																																														
	∴ The Boolean expression (simplified) is $P[C+S]$																																														



**Extract 1.1:** A sample of correct responses to question 1 of paper 1

In Extract 1.1, the candidate correctly constructed the truth table representing the DART smart system in part (a) and successfully a simplified Boolean expression in part (b). The candidate also correctly drew logic gate circuit in part (c).

Additionally, most of the candidates who scored average mark (3.5 - 5.5), correctly identified all required inputs and successfully constructed the truth table in part (a). They were also able to generate the Boolean expression from the truth table; however, they failed to simplify it correctly in part (b). In part (c), some of these candidates mistakenly drew electron circuit instead of logic gate. This suggests that they had inadequate understanding of Boolean laws and their application in logic circuit design.

Moreover, some of the candidates (33.33%) who scored low marks demonstrated limited understanding of the question requirements. In part (a), several candidates correctly identified only two inputs instead of the required three for constructing the truth table. For instance, some candidates included only “*coin*” and “*smart card*” omitting “*passenger*”. Meanwhile, others included “*passenger*” and “*coin*” but excluded “*smart card*”. A few candidates correctly identified all three inputs but failed to generate the correct output for the truth table. For example, one candidate used the OR operator instead of the AND operator to construct logical expressions. In part (b) these candidates failed to generate the Boolean expression from the truth table created. Moreover, in part (c), some of these candidates used XOR gate instead of AND and OR gate to draw logical gate circuit. The analysis shows that these candidates had insufficient knowledge of data representation. Extract 1.2 presents a sample of incorrect responses from one of the candidates.

Q1 let passenger be P  
Coin be C  
Smart card be S.

(a) TRUTH TABLE:

P	C	S	Q
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

(b)

$$(P\bar{C}S) + (PC\bar{S})$$

$$(P.C) + (P.S).$$

∴ Simplified boolean expression  
is  $Q = (P.C) + (P.S)$

(c)

from

$$Q = (P.C) + (P.S)$$

**Extract 1.2:** A sample of incorrect responses to question 1 of paper 1

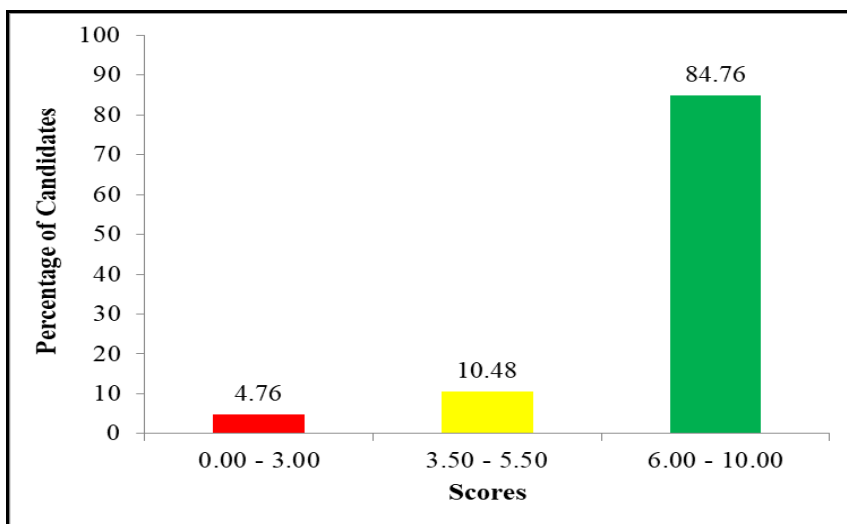
In Extract 1.2, the candidate successfully identified the three required inputs value but failed to generate an output value in part (a). In part (b), the candidate also, was unable to derive a Boolean expression from the contracted truth table and did not apply Boolean algebra laws to simplify it. Moreover, in part (c) candidate drew irrelative logic gate circuit that did not reflect the intended logical operations.

## 2.1.2 Question 2: C++ Programming

The question had two parts: (a) and (b). The question was as follows;

- (a) *Compare the following C++ programming terms and give one example for each.*
  - (i) *Formal and actual function parameters.*
  - (ii) *Pre-decrement and post-decrement operators.*
- (b) *Construct a C++ program that adds two real numbers entered by a user.*

A total of 210 (100%) candidates attempted this question. Of which 10 (4.76%) scored from 0 to 3 marks, 22 (10.48%) scored from 3.5 to 5.5 marks, and 178 (84.76%) scored from 6 to 10 marks out of 10 marks allocated. Figure 2 illustrates the candidates' performance in this question.



**Figure 2:** *The Candidates' Performance on Question 2, Paper 1*

The general performance in this question was good because 95.24 per cent of the candidates scored above 3 marks. Statistics shows that 84.76 per cent of the candidates scored high marks (6–10). These candidates demonstrated a strong understanding by correctly comparing C++ programming terms and gave one example for each term in part (a) (i) and (ii). In part (b), most of the candidates correctly constructed a C++ program that adds two real numbers entered by user. Other candidates failed to declare variable properly which led them lose some marks. Analyses show that these

candidates had sufficient knowledge of C++ programming. Extract 2.1 presents a sample of correct responses to question 2.

2a) i)	<p>Formal function parameters are the parameters that are in the function definition section and are used to declare the variables</p> <p>Example: <code>int sum(int x, int y)</code></p> <p>while</p> <p>Actual function parameters are used to call the function that was previously declared to perform a certain activity. Example: <code>Sum(num1, num2)</code></p>
ii)	<p>Pre-decrement operators are the operators that performs the activity of decreasing a value before displaying the result.</p> <p>Example, if given: <code>a = 5;</code></p> <p><code>cout &lt;&lt; --a &lt;&lt; endl;</code></p> <p>The value displayed will be 4.</p> <p>while</p> <p>Past decrement operator are the operators that performs the process of decreasing a value after displaying the result.</p> <p>Example, if given: <code>a = 5</code></p> <p><code>cout &lt;&lt; a-- &lt;&lt; endl;</code></p> <p>The value displayed will be 5.</p>
2b)	<pre>#include &lt;iostream&gt; using namespace std; int main () {     int a, b, sum;     cout &lt;&lt; "enter two real numbers to be added: " &lt;&lt; endl;     cin &gt;&gt; a &gt;&gt; b;     sum = a + b;     cout &lt;&lt; "the sum of two real numbers is " &lt;&lt; sum &lt;&lt; endl;     return 0; }</pre>

**Extract 2.1:** A sample of correct responses to question 2 of paper 1

In Extract 2.1, the candidate correctly compared the given C++ programming terms and provides appropriate examples for each in part (a). In part (b), the candidate successfully constructed a C++ program that adds two real numbers entered by a user.

The analyses results showed that 10.48 per cent of the candidates scored average marks. The majority of these candidates were able to compare only one pair of C++ programming terms in part (a) but did not provide relevant example. In part (b), some candidates correctly included the library header and demonstrated understanding of C++ functions, but failed to declare variables properly. Conversely, other candidates were unable to compare the C++ programming terms provided in part (a). However, they correctly wrote lines of codes that add two real numbers with few syntax errors such as incorrect variable declaration, repetition of line of codes and others mixed up the use “cout<<” and “cin>>” in part (b). Additionally, these candidates failed to declare variable, assign equation of adding two real numbers, and providing proper initialization of the program which led them to lose some marks.

Few candidates (4.76%) scored low marks on this question. Analysis indicated that these candidates failed to compare the given C++ programming terms in part (a). However, some managed to compare at least one pair of C++ terms. In part (b), the candidates were unable to; use the correct library name, declare variables, accept numbers from the user, display the output on the screen, and terminate the program properly. These shortcomings reflect insufficient knowledge of C++ programming concepts. Extract 2.2 presents a sample of incorrect responses to question 2.

Q. (a)	
(i) Formal parameters :	Are the type of parameters in which are performed in sequence.
(ii) Actual function parameters :	These are the types of parameters in which their functions might run but not in sequence.
(iii) Pre decrement operators :	This are the codes in which they are not complete to be run due to some error in it.
	Post decrement operators : Are the operators which are completely to be read by the computer program easily.

b	<code>&lt;include iostream&gt;</code>	
	<code>;</code>	
	<code>&lt;using namespace std&gt;;</code>	
	<code>int main = i;</code>	
	<code>int a &lt;= 9;</code>	
	<code>int b &lt;= 9;</code>	
	<code>int a + int</code>	
	<code>a + b ; &lt;&lt;endl</code>	
	<code>Return 0;</code>	

**Extract 2.2:** A sample of incorrect responses to question 2 of paper 1

In Extract 2.2, the candidate failed to compare given C++ programming terms in part (a), but managed to construct two lines of code correctly. However, in part (b), the candidate did not declare variables, and wrote incorrect code to perform calculation, input and output operation.

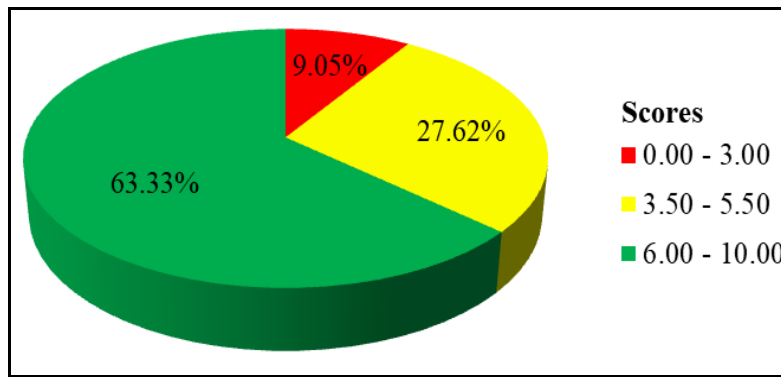
### 2.1.3 Question 3: IT Environment

This question had four parts namely: (a), (b), (c) and (d). The question was stated as follows;

*The Computer Research Institute (CRI) disposes its electronic waste (e-waste) on landfills without taking any precautions.*

- (a) *What are the two major environmental effects caused by the CRI actions?*
- (b) *Which safest disposal method can be used by the CRI?*
- (c) *Why CRI is advised to use proper electronic waste? Explain by giving four reasons.*
- (d) *Describe two health hazards that can be linked to poor e-waste management.*

The analysis of candidates' performance shows that out of 210 (100%) candidates who attempted this question, 19 (9.05%) scored from 0 to 3 marks and 58 (27.62%) candidates scored from 3.5 to 5.5 marks. The candidates who scored from 6 to 10 marks were 133 (63.33%) out of 10 marks allocated. Figure 3 illustrates the candidates' performance in this question.



**Figure 3:** *The Candidates' Performance on Question 3, Paper 1*

Generally, this question had a good performance because 90.95 per cent of the candidates scored above 3 marks. The analysis showed that 63.33 per cent of the candidates who scored high marks correctly identified the environmental effects caused by CRI actions in part (a), and the safest disposal method used by CRI in part (b). However, many of these candidates struggled to provide all four correct reasons for the benefits of proper e-waste management in part (c). Some repeated similar reasons as separate points. In part (d), these candidates correctly described two health hazards linked to poor e-waste management. Overall, this demonstrates that these candidates had a sufficient understanding of the improper e-waste disposal, environmental health-related impact. Extract 3.1 presents a sample of correct responses to question 3.

3 a)	Resource depletion - some of the e-wastes take a long time to replenish hence destructs the environment for a long time.	
ii)	Land pollution - some e-wastes cause pollution and can cause the risk of hurting people, this is through broken devices.	
3 b)	Donating to a non profit organization	
	Refurbishment of IT devices.	
	Choosing a reliable vendor for disposing the e-wastes.	
	Selling of the old computer hardware.	

3c)	To avoid land and air pollution.	
	when the electronic wastes are properly disposed, there will be less wastes in landfills thus the environment will be protected from pollution.	
ii)	To prevent health hazards that are related to the improper disposal of electronic wastes such as injuries which can be acquired when one steps on pieces of breakable computer parts.	
iii)	To prevent global warming, which can be caused for instance a person decides to burn down the electronic wastes thus the smoke affects the atmosphere.	
iv)	To prevent the increase in green house effects. The smoke from burning the electronic wastes lead to the accumulation of greenhouse gases that can cause increase in greenhouse effect.	
3d)	Injuries which are physical, these can be caused by disposal of breakable wastes that can cause injuries.	
	Lung cancer due to smoke that result from burning the electronic wastes which may interfere with the respiratory processes.	

**Extract 3.1:** A sample of correct responses to question 3 of paper 1

In Extract 3.1, the candidate correctly identified the environmental effects caused by CRI's action in part (a), as well as safest disposal methods used by the CRI in part (b). The candidate also correctly explained the benefits of proper e-waste management in part (c) and health hazards linked from poor ICT waste disposal in part (d).

Further analysis of candidates' responses revealed that (27.62%) of the candidates who scored average marks correctly identified two environmental effects caused by CRI action in part (a), and the safest disposal method in part (b). However, most of these candidates provided only one or two correct benefits of proper e-waste management in part (c). In part (d), some of the candidates described only one correct health hazard related to poor e-waste management while others repeated the same hazard

in a different word. For example, one candidate wrote “*it causes skin cancer, and it causes skin disorder*”. These responses indicate that the candidates had inadequate understanding of the environmental and health consequences of improper e-waste disposal.

Moreover, 9.05 % of the candidates scored low marks (0 - 3). The majority of these candidates correctly identified only one major environmental effect caused by improper e-waste disposal in part (a). In part (b), the majority of these candidates correctly identified the safest disposal method. However, in part (c), many candidates struggled to provide accurate benefits of proper e-waste management. Some incorrectly related proper e-waste disposal to cyber security issues. For example, one candidate wrote *To avoid unauthorized cyber-attack*, and another wrote *To avoid leakage of people’s property*.

In part (d), some of the candidates did not attempt the question at all. Among those who did it, some confused general diseases related to poor sanitation with health hazards specifically caused by improper e-waste disposal. For example, one candidate wrote *It causes diarrhea*, and another wrote *It causes vomiting*. Others incorrectly associated poor e-waste disposal with physical injuries. These misconceptions indicate that the candidates had insufficient knowledge of proper e-waste management and its associated health impacts. Extract 3.2 presents a sample of incorrect responses to question 3.

3.	(a)	(i) Air pollution	Skeleton effect	
		(ii) Land pollution	Bones effect	
	(b)	The safest disposal method can be used by the CRJ IS RECYCLING METHOD		
	(c)	(i) in order to maintain health safety		
		(ii) make clean environment		
		(iii) reduce the destruction of the electronic waste		
	(d)	(i) Destroy of the bones		
		(ii) Ex-skeleton effects		

**Extract 3.2:** A sample of incorrect responses to question 3 of paper 1

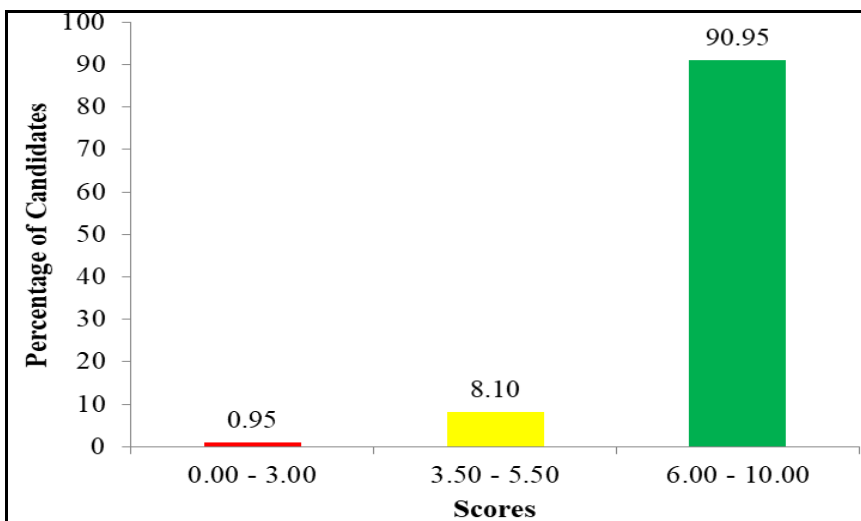
In Extract 3.2, the candidate failed to identify the environmental effects caused by CRI actions in part (a), however, correctly identified the safest disposal method in part (b). The candidate also wrote irrelative answer in parts (c) and (d).

#### 2.1.4 Question 4: Data Communication and Networking

In this question, the candidates were required to read the following scenario and answer the question that follows:

- (a) *Memo primary school plans to connect the computers to its three offices located in the same building.*
- (i) *Which type of network would you suggest to be established?*
  - (ii) *Identify three basic network components that should be used in installing the network.*
  - (iii) *Explain three advantages of the type of network identified in 4(a)(i).*
- (b) *Describe two benefits of using bounded media instead of unbounded media in connecting school network.*

A total of 210 (100%) candidates attempted this question whereas 2 (0.95%) scored from 0 to 3 marks, 17 (8.10%) scored from 3.5 to 5.5 marks and 191 (90.95%) scored from 6 to 10 marks out of the 10 marks allocated. Figure 4 summarizes the candidates' performance in this question.



**Figure 4:** *The Candidates' Performance on Question 4, Paper 1*

This question had good performance because 99.05 per cent of the candidates scored more than 3 marks. A majority of candidates (90.95%) achieved high marks. Most candidates in this category correctly identified the type of network, its advantages, and the basic network components required to install the network in part (a). They also accurately explained the advantages of identified network type in part (a) (i). However, some candidates repeated the same advantage using different wording, while others provided general benefits applicable to all network types such as “easy sharing of resources” instead of specifying the advantages to a Local Area Network (LAN). These shortcomings resulted in a minor loss of marks. In part (b), most candidates correctly described two benefits of using bounded media over unbounded media in a networked environment. This indicates that, these candidates demonstrated sufficient knowledge of networking concepts. Extract 4.1 presents a sample of correct responses.

4.	a) i) The type of network to be established is <u>Local Area Network</u> .	
	ii) Networking components to be installed in network are	
	- Networking devices such as hubs, switches or routers for connectivity or hosting the network	
	- Networking software that is to be used to use and obtain data and information from the computers in the offices	
	- Transmission media such as twisted pair cables for connecting the computers in the building.	

4.	iii) The advantages of using Local Area Network are as follows;	
	- It is fast due to different factors such as a few number of users but also most local Area Networks use bounded media which is very fast.	
	- It is highly secure due to being limited and controlled by few people and can be accessed only when authorized by network holders	
	- It facilitates distributed processing due to centralization hence tasks can be performed from multiple computers but controlled by one hub or server	
	b) The benefits of using bounded media over unbounded media in connecting school network are as follows	
	i) Bounded media has higher speed and bandwidth to facilitate faster transmission of information in the school network. For example use of fibre optic cables enables the relay of signals at the speed of light.	
	ii) Bounded media is more secure in terms of the limit to connectivity and access to the network unless connected to the network by a cable hence prevents direct connection such as wireless or unbounded to unauthorized users.	

**Extract 4.1:** A sample of correct responses to question 4 of paper 1

In Extract 4.1, the candidate correctly identified the types of networks and the basic network components required for LAN installation in part (a), and clearly explained the advantages for choosing a LAN. In part (b), the candidate correctly described two benefits of using bounded media instead of unbounded media to connect the network.

The data analysis shows that 8.10 per cent of the candidates who scored average marks experienced difficulties in identifying the type of network to be established in a school in part (a). For example, one candidate wrote, *the type of network is geographical area network* instead of local area network. These candidates failed to explain the correct advantages because they referred to the wrong type of network identified in part (a) (i). However, some of these candidates managed to identify some components to be used for LAN installation in part (a) (ii), In part (b), some of them also failed to describe the benefits of using bounded media instead of unbounded media in connecting a network.

Additionally, while some candidates correctly identified the type of network in part (a) (i) and listed the basic components in part (a) (ii), they failed to explain the advantages of the identified network. Lastly, most of them were able to explain only one benefit of using bounded media over unbounded media.

Further analysis shows that only 0.95% of the candidates, who scored low marks, failed to identify the type of network to be installed in part (a)(i), correctly identified at least one component required to set up such a network in part (a)(ii). They also provide some advantages of the identified network in part (a) (iii), but failed to describe the benefits of using bounded media instead of unbounded media in part (b). Extract 4.2 presents a sample of an incorrect response from one of the candidates.

4a)	The type of network to be established is Wireless Network.	
ii)	Component of networks are ;	
a)	Transmission media	
b)	Sender	
c)	Receiver	
iii)	Three advantages of any network identified are ;	
a)	Easy and faster to access the data.	
b)	Low cost of transmission.	
d)	Low intra-office traffic.	

b)	Three benefits of bound media instead of unbound media in connecting school network are;	
i)	Bounded media are faster and easy to install.	
ii)	Bounded media doesn't take a lot of time in installation.	

**Extract 4.2:** A sample of incorrect responses to question 4 of paper 1

In Extract 4.2, the candidate failed to identify the type of network to be established in part (a)(i), however, identified some components required for LAN installation in part (a)(ii) and provided one valid advantage of choosing a LAN in part (a)(iii). The candidate also did not describe the benefits of using bounded media over unbounded media in part (b).

### 2.1.5 Question 5: Visual Programming

The question had three parts: (a), (b) and (c). The question was as follows;

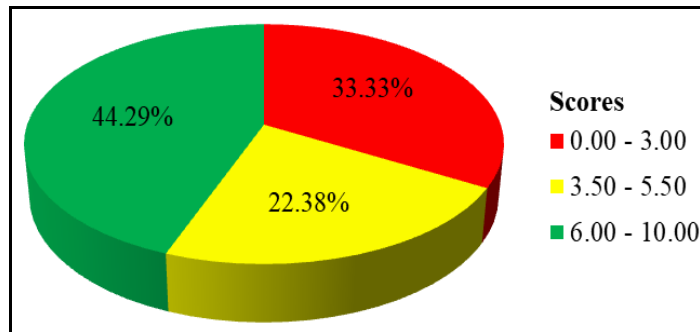
- (a) *Construct a Visual Basic program that will assist the restaurant to manage its daily sales. The program prompts a user to enter food price via a text box appeared in a form. The program also should display the type of food ordered in a message box according to the price range specified in Table 1.*

**Table 1: Price Range and Type of Foods**

<b>Price Range</b>	<b>Type of Food</b>
<i>Lager or equal to 10,000</i>	<i>Sea Food</i>
<i>Lager or equal to 5000</i>	<i>Vegetarian Food</i>
<i>Less than 5000</i>	<i>Other Food</i>

- (b) *Write a Visual Basic program that validates the application date of interview for new employees. The interview is valid if the date is today or next four days, otherwise the program displays the message "invalid date" in the message box.*
- (c) *What is the function of the following Visual Basic tools in customizing a form?*
- (i) *Option Button*
  - (ii) *Label*
  - (iii) *Timer*
  - (iv) *Combo Box*

A total of candidates who attempted this question were 210 (100%), out of whom 70 (33.33%) scored from 0 to 3 marks, 47 (22.38%) scored from 3.5 to 5.5 marks, and 93 (44.29%) scored from 6 to 10 marks out of the 10 marks allocated. Figure 5 illustrates the candidates' performance in this question.



**Figure 5:** *The Candidates' Performance on Question 5, Paper 1*

The general performance on this question was good, with 66.67% of the candidates scored above 3 marks. The analysis indicates that the majority of these candidates (44.29%) correctly constructed the Visual Basic (VB) codes in both parts (a) and (b). However, some encountered difficulties in correctly applying conditional statements as required generating accurate output. Moreover, some of these candidates gave correct functions of some VB tools in part (c). For example, one candidate wrote that the role of an option button as *to select more than one option among many options given*. It was observed that some of the candidates confused the function of an option button with that of the combo box. Extract 5.1 presents a sample of correct responses from one of the candidates.

5 a)

```
Private sub Form_Load()  
Dim X as Integer  
X = Text1.Text  
If X >= 10,000 Then  
    MsgBox("Sea food")  
Else If X >= 5000 Then  
    MsgBox("Vegetarian Food")  
Else  
    MsgBox("Other Food")  
End If  
End sub
```

5 b)

```
Private sub Form_Load()  
Dim d As Date → d = InputBox("Enter the date")  
If d >= Date And d <= Date + 4 Then  
    MsgBox("Valid date")  
Else  
    MsgBox("Invalid date")  
End If  
End sub
```

c)

i. Option Button

This is a type of control which operates when it is chosen, if it is an option you can either use it or not use it and use the other.

ii. Label

This is used to display a text that is not editable in run mode.

e.g. Label1.Caption = "Rebecca"

	iii. Timer	
	Control values that are displayed in set of interval	
	e.g Traffic lights	
	Timout time = now #	
5.	iv) Combo box	
	To display list of item or displaying thing that are suppose to be listed meaning more than one staff displayed vertically.	

**Extract 5.1:** A sample of correct responses to question 5 of paper 1

In Extract 5.1, the candidate correctly constructed a Visual Basic (VB) program in part (a) that displayed the types of food ordered in a message box based on the specified price ranges provided in the table. In part (b), the candidate also successfully created a VB program to validate the interview application date for a new employee. Additionally, in part (c), the candidate accurately explained the functions of several VB tools.

Similarly, the 22.38 per cent of candidates who scored average marks successfully constructed a VB program to assist a restaurant in managing its daily sales in part (a), and correctly explained the functions of the given VB tools in part (c). However, some candidates had difficulty declaring the variables of date in part (b). For example, one candidate incorrectly declared a date variable as an integer. Others wrote an alert code for displaying a message instead of msgBox. For instance, one candidate wrote *alert("Message to display")*. This shows that while these candidates had sufficient knowledge of Visual Basic programming, some still lacked understanding in declaring data type.

On the other hand, 33.33% of the candidates who scored low marks were able to correctly write the VB code to starting and end the program but used incorrect declarations and methods for executing variables in parts (a) and (b). Others managed to initialize variables only. However, some of these candidates failed to use the selection control structure properly. For example, one candidate wrote Dim price as String instead of Dim price as Integer.

Furthermore, some of the candidates failed to initialize variables as required. For instance, some of them wrote the conditions of food price without declaring any variables. Additionally, a few candidates listed the types of food mentioned in the question constructing the required program in part (a). In addition, some of them also incorrectly attempted to construct the programs using HTML tags or JavaScript instead of Visual Basic (VB) language. Moreover, these candidates provided incorrect functions of VB tools used to customize a form in part (c). For example, one candidate wrote, *the role of a label is to insert data into the database*, which is incorrect. These responses show that the candidates had insufficient knowledge of VB programming. Extract 5.2 presents a sample of incorrect responses.

5(a)	float - sub form ( ) Dim A as an integer Dim B as an integer A = Val ( Rich text box 1. text ); <del>B = Val ( Rich text box 2. text );</del> B = Val ( List text box 2. text ); If A >= 10,000; Alert "Sea food"; Else If A >= 5000 Alert "Vegetaria food".
5(c)(i)	Label. give chance a programmer to label different names, values or items
(ii)	Timer. Used to count of times in visual basic programming.
(iii)	Combo Box. give out a list of items name when a user drag an arrow. see the List of items.
(d)	option button. give a chance a user to select only one option from the list provided.
5(b)	float as - sub form ( ) Dim A as an integer A = Val ( Rich text box 1. text )

**Extract 5.2:** A sample of incorrect responses to question 5 of paper 1

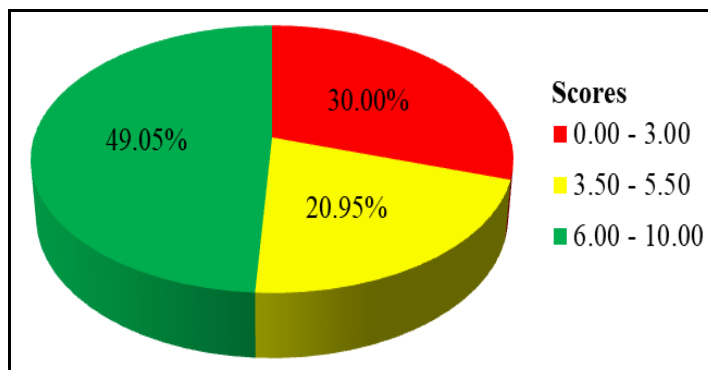
In Extract 5.2, the candidate declared variables and created a text box for users to enter the price of the food, but failed to display the corresponding food types in a message box based on the price range in part (a). In part (b), the candidate wrote irrelevant code segment to validate the date. However, in part (c), the candidate successfully explained the function of several Visual Basic tools used to customize a form in part (c).

### 2.1.6 Question 6: Web Development.

This question had two parts: (a) and (b). The question was as follows;

- (a) *Why is Hyper-Text Markup Language (HTML) not considered as true programming language? Explain by giving two reasons.*
- (b) *What are the three advantages of embedding JavaScript codes in HTML document?*

A total of 210 (100%) candidates attempted this question. Whereas 63 (30.00%) scored from 0 to 3 marks, 44 (20.95%) scored from 3.5 to 5.5 marks, and 103 (49.05%) scored from 6 to 10 marks out of the 10 marks allocated. Figure 6 illustrates the candidates' performance on this question.



**Figure 6:** *The Candidates' Performance on Question 6 in Paper 1*

The general performance on this question was good, as 70 per cent of the candidates scored above 3 marks. The analysis showed that 49.05 per cent of the candidates who scored high marks correctly explained the main reasons of not considering HTML as a true programming language in part (a). Some of the candidates also accurately listed the advantages of embedding JavaScript code in an HTML document in part (b). However,

some of them provided incomplete responses which lack specific technical details to support their explanations. Others provided two reasons, but their explanations were unclear. However, majority of these candidates correctly provided the advantages of embedding JavaScript code in HTML in part (b). This shows that these candidates had sufficient knowledge of HTML. Extract 6.1 presents the correct response from one of the candidates.

6.	a) i) It doesn't involve the use of functions - A true programming language is recognized by involving the use of functions in developing a certain program whereas HTML doesn't employ this as a result it's not a true programming language.	
	ii) It doesn't have control structures - A true programming language employs the use of control structures like for loops in developing a program whereas HTML doesn't employ this as a result it is not a true programming language.	
	b) i) It enhances user interactivity - The use of javascript code in HTML helps the user to interact with the program because HTML has static content.	
	ii) It enhances client-side programming - The use of javascript code in HTML document helps the client side programming due to the use of different features by javascript that help the user to access the program.	
	iii) It helps to validate forms - The use of javascript code in HTML document helps to ensure data validation in forms which help to govern what the user should input in the program.	

**Extract 6.1:** A sample of correct responses to question 6 of paper 1

In Extract 6.1, the candidate correctly provided reasons for not considering HTML as a true programming language in part (a), and also presented the advantages of embedding JavaScript code in an HTML document in part (b).

Some of the candidates (20.95%) who scored average marks explained two reasons for not considering HTML as a true programming language in part (a). However, some candidates struggled to provide correct explanations. For example, one candidate wrote, *HTML does not require a compiler to be executed*. Another wrote, *it uses Notepad as a web editor but not programming*, which led to lost marks. In part (b), most of these candidates gave only one or two advantages of embedding JavaScript code in an HTML document.

Furthermore, 30% of the candidates scored low marks (0 – 3). Some of these candidates provided only one out of two reasons for not considering HTML as a true programming language in part (a). Few of these candidates defined HTML instead of giving reasons for not considering HTML as a true programming language. In part (b), these candidates were unable to identify the advantages of embedding JavaScript code in an HTML document. Moreover, some provided only one out of three advantages. This analysis shows that these candidates had insufficient knowledge of HTML. Extract 6.2 presents the incorrect response from one of the candidates.

(0a)	i) Because it does not the language <sup>like</sup> <del>of</del> C++, 'its language interact with human language.'	
	ii) It is using simple tags compared to other programming languages.	
b	i) It activates the commands; example sending, calculating and many others.	
	ii) But also, allows to check the validity of a certain activity.	
	iii) Javascript codes enable people to <del>develop</del> their awareness through frequent practice.	

**Extract 6.2:** A sample of incorrect responses to question 6 of paper 1

In Extract 6.2, the candidate failed to provide reasons for not considering HTML as a true programming language in part (a). In part (b), the candidates had an idea on advantages of JavaScript but failed to provide clear explanations.

### 2.1.7 Question 7: Computer Basics

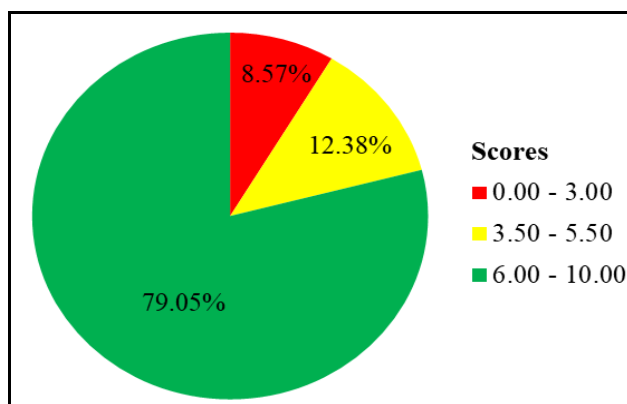
This question had two parts: (a) and (b). The candidates were required to read a scenario given and answer the questions that follow. The question was as follows:

*Nzele Company Ltd. plans to utilise computers for managing day-to-day operations in its newly established branch. To meet the requirements, the company purchased computers, the the Microsoft Windows Operating System, and the Microsoft Office program. The company's IT officer installed the software on the computers, starting with the Operating System (OS) followed by Microsoft Office.*

*(a) Why is the IT officer started to install OS? Give two reasons.*

*(b) Why is the company decided to buy and use the software rather than developing its own? Give three reasons*

The candidates who attempted this question were 210 (100%), out of whom 18 (8.57%) scored from 0 to 3 marks, 26 (12.38%) scored from 3.5 to 5.5 marks, and 166 (79.05%) scored from 6 to 10 out of the 10 marks allocated. Figure 7 illustrates the candidates' performance in this question.



**Figure 7:** The Candidates' Performance on Question 7 of Paper 1

The general performance of the candidates in this question was good because 91.43 per cent of the candidates scored above 3 marks. Most of these candidates (79.05%) who scored high marks correctly provided reasons for starting OS installation in part (a) and gave three reasons for the company to buy software instead of developing its own in part (b). However, other candidates correctly gave only two reasons for starting OS

installation and two reasons for buying software. Extract 7.1 presents a sample of correct responses from one of the candidates.

7a.	The IT officer start to install OS because the operating system helps to manage the basic hardware resources of a computer.	
	The Operating system is the relay or the medium of communication between the user and the system unit the CPU. it comes carrying other office suites that can be used in the computer.	
7b.	The company decided to buy the software because it is cheap to buy the software than to develop it.	
	ii. The company decided to buy the software because it is easy to use and it is time consuming to develop its own software.	
	iii. The company has decided to buy the software rather than developing its own because the operating systems are sold on open market and are used by most of the people in the world therefore they are guaranteed to be secure and more accurate.	

**Extract 7.1:** A sample of correct responses to question 7 of paper 1

In Extract 7.1, the candidate correctly gave the reasons for starting OS installation in part (a), and also explained for the company to buy software rather than develop its own in part (b).

Likewise, the analysis showed that 12.38% of the candidates scored average marks. In part(a), most of these candidates gave unclear explanations for starting OS installation before application software. For example, one candidate wrote: *foundation of computer functionality, enable applications on the computer to function*. In part (b), these candidates gave

only one or two out of three reasons for the company to buy software instead of develop its own with unclear explanations.

Additionally, some candidates provided incorrect reasons for the company to install the OS before application software in part (a), however correctly provided two reasons for the company to buy software instead of developing its own in part (b). For instance, one candidate wrote: *for security purpose*, which was not a correct reason in context.

Statistics analysis showed that 8.57% of candidates scored low marks. In part (a), some candidates provided only one reason for installing the operating system before the application software. In part (b), they struggled to give clear explanations for the company to buy software rather than develop its own. For instance, responses such as “*OS controls the computer schedule*” and “*it is too complicated to develop your own software*” lacked clarity, which led to lost marks. A few candidates did not attempt part (b) at all. Others copied the question or gave incorrect answers like *buying software helps to get the new and advanced software* or *offers good security*. These responses show that these candidates had insufficient knowledge of computer software. Extract 7.2 present a sample of an incorrect response.

7a)	- The Operating System enables good interaction between the user and the devices used in the computer.	
	- The operating system provides a set of instructions which are going to power up the brain of the computer system.	
b)	- It is too complicated to create your own software for the company.	
	- Buying software helps us to get the new and advanced features of the computer system.	
	- The softwares bought offer good security features for the company.	

Extract 7.2: A sample of incorrect responses to question 7 of paper 1

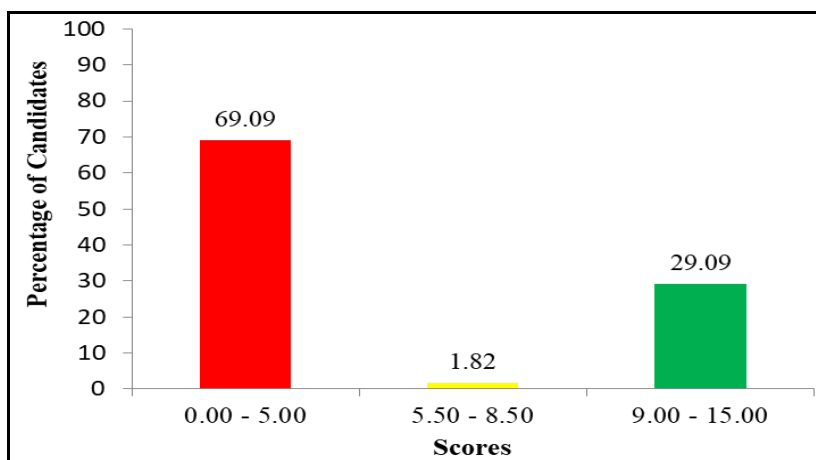
In Extract 7.2, the candidate provided only one correct reason for installing the operating system first in part (a), but failed to give clear reasons for the company to purchase software rather than develop its own in part (b).

### 2.1.8 Question 8: System Development.

This question was an essay question and the candidates were required to justify a given statement. The question was as follows:

*“Effective software development involves various categories of key personnel.” Justify this statement by giving eight points.*

The statistics shows that 55 (26.20%) candidates attempted this question, whereas 38 (69.09%) scored from 0 to 5 marks, 1 (1.82%) scored from 5.5 to 8.5 marks, and 16 (29.09%) scored from 9 to 15 out of the 15 marks allocated. Figure 8 illustrates the candidates' performance in this question.



**Figure 8:** The Candidates' Performance on Question 8 of Paper 1

Generally, the candidates' performance on this question was weak because 69.09 per cent of candidates scored below 5.5 marks. The analysis of the candidates' responses revealed that, some of the candidates failed to identify key personnel involved in system development and did not provide a conclusion. Others defined the term *system development* in their introduction and listed one to three correct roles of key personnel involve in system development with unclear explanations and lacked a conclusion. Additionally, some of the candidates confused system development with

system software. For example, one candidate listed: “OS, Installation, Microsoft Word, and Smadav.” Moreover, some of the candidates explained key personnel involved in website development instead of software development. For example, some of the candidates wrote, web designer, web developers.

Further analysis indicated that some confused the steps for system development with the individuals involved. For instance, one candidate mentioned; *Problem identification, Information gathering, Requirement specification, System design, and System implementation*. Extract 8.1 presents a sample of incorrect responses.

8.	<p>Softwares these are systems that help the computer functionality. Softwares are classified into two categories Operating softwares that includes Microsoft window, linux and others while other category is application softwares that includes Microsoft word, Smadav, Avast that helps the computer to operate a specific task.</p>	
	<p>Effective software development involves various categories of key personnel. Here are eight points that justify this statement; Firstly, Each softwares perform specific task in computer; This means that there are different softwares but each software can not perform more than one function therefore should perform specific task.</p>	
	<p>For example Microsoft words softwares are specifically for writing and typing words in computer while Smadav and Avast acts as anti-virus program in computer.</p>	
	<p>Secondly, Operating softwares (Os) are installed first rather than application software, this means that application softwares cannot function in a computer if there is no program that allow such software to run in Pc.</p>	
	<p>For example, Installation of Microsoft word, Smadav and Avast needs first Microsoft window be installed for them to run.</p>	
	<p>Thirdly; Both operating softwares (Os) and Application Softwares depends on each other; This means one is dependent and other independent</p>	

8	<p>Forexample,</p> <p>The computer depends on Application software in order to operate even if operating systems (Os) are already installed.</p> <p>Fourthly, The Operating Softwares allow Application softwares to work (operate); Regardless of how expensive to develop them but needs first Operating Softwares be installed in the computer for them to work.</p> <p>Fifthly, Need to be re-installed regularly; Both operating Software needs to be re-installed regularly to ensure their functionality. Even for application softwares needs to re-installed regularly to ensure their functionality.</p> <p>Sixthly; Allow use of android; Both application and Operating Softwares they operate to the android computer this is where their function can be reliable.</p> <p>Seventhly, Their privacy owned; The softwares their owned privately by their developers thus in order to install them needs to be bought.</p> <p>eightly; More careful since they need to be installed regularly as they expire their functionality</p> <p>Generally, Softwares are the backbone of the Computer functionality means that, The computer can not operate without Operating Softwares as well as Application Softwares.</p>
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Extract 8.1: A sample of incorrect responses to question 8, paper 1

In Extract 8.1, the candidate provided an incorrect introduction and explained points related to system software and application software, instead of identifying and stating the roles of individuals involved in software development. Additionally, the candidate failed to provide a clear conclusion.

On the other hand, only 29.09% of the candidates scored high marks. These candidates provided a clear and accurate introduction by addressing the concept of system development, thoroughly explaining the roles of each key personnel involved, and concluded their responses appropriately. However, some of the candidates correctly explained six out of eight key personnel with their roles. Analysis showed that these candidates had

sufficient knowledge of system development. Extract 8.2 presents a sample of a correct response.

8.	<p>Software development refers to the process of defining, designing, implementing and document a system (new system). Software development is characterized by input, process, output, objectives, standards and feedback. There are many approaches in system development which include predictive approach, adaptive approach and object-oriented approach. The system or software development involves various categories of key personnel such as the following:</p> <p>Project manager; This is the personnel who oversees and coordinates all the activities of software development, assigns different tasks to the people and ensure development of the software. The project manager is a very important personell in software development. Foreexample a project manager like Mark Zuckerberg who developed facebook.</p> <p>Software engineer; This refers to the personnel who is responsible for development for the software, where he/she codes the program and work collaboratively with other personell to ensure that the software is developed. Foreexample the software engineer in Vodacom company has developed the M-pesa application.</p> <p>System analyst; refers to the personnel who analyzes the business need and bridges the gap of business needs with the software. System analyst comes up with the solution and ways to solve a problem. Foreexample the problem inaccessibility to bank services which was analyzed by banks like National microfinance bank (NMB), NMB app.</p> <p>Network administrator; refers to the personnel which is responsible for establishment of networks and also maintanance of the network. The network administrator ensure people's access to a network. Foreexample the network Vodacom and Airtel require network administrators to ensure people get access to the network.</p>	
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8.	<p>Database administrator; refers to the personnel whose responsible for development or create a database and also ensure proper security of data in a database. The database administrator should also ensure proper backup and access to each individual (permit access to members) in the database.</p>	
	<p>Website administrator; refers to the personnel whose responsible for developing a website and also ensure regular updation of contents on the website. Website administrator is very important in providing information about the software as well as validation of its users or members. And also the website administrator also ensures security and maintenance of the website.</p>	
	<p>Stakeholders; refers to a group of people who propose the business needs and capital for the development of the software, stakeholders also play a crucial in ensuring that the needs (business needs) are met and also if the software works accordingly as per the demands of the people</p>	
	<p>Investors; refers to the external personnel who allocate funds for the software development, the investors ensure that all the funds for the software development are in check and also ensures the requirements for the software development are in place.</p>	
	<p>All in all; Software development is not possible without the categories of key personnel and hence the software development process will be nothing without the key persons.</p>	

**Extract 8.2:** A sample of correct response to question 8, paper 1

In Extract 8.2, the candidate provided a well-structured introduction and conclusion, and clearly explained the roles of key personnel involved in system development.

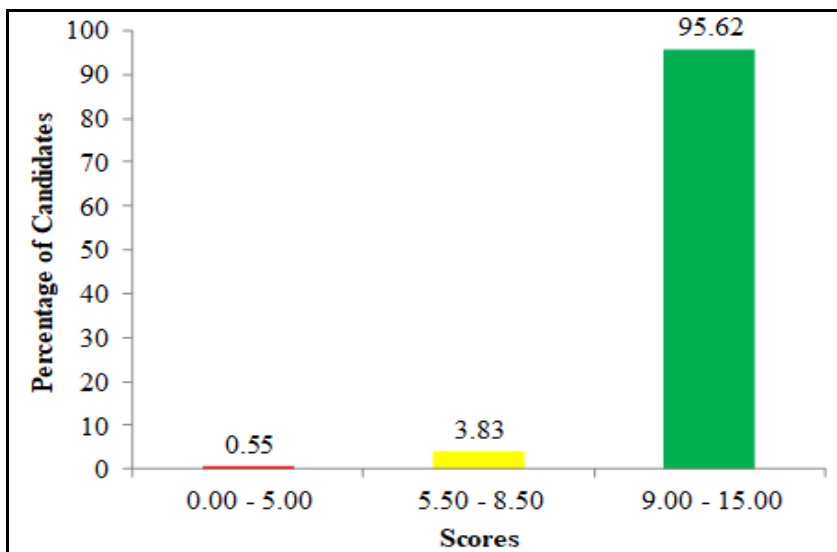
### 2.1.9 Question 9: Computer Security and Privacy

This was an optional question; the candidates were required to read the scenario and then answer the questions that follow.

*Mashaka has been working for a new album expected to be released at the end of the year. Some of the lyrics, sound tracks, and sampled songs are*

*saved in his computer. A few days ago, Mashaka heard the song in the city radio which had the same lyrics content as one of the songs in his unreleased album. Describe three possible factors which led to the leakage of his song and three ways that could have been used to avoid it.*

The statistics show that 183 (87.10%) candidates attempted this question, whereas 1 (0.55%) scored from 0 to 5 marks, 7 (3.83%) scored from 5.5 to 8.5 marks, and 175 (95.62%) scored from 9 to 15 out of the 15 marks allocated. Figure 9 summarizes the candidates' performance in this question.



**Figure 9:** *The Candidates' Performance on Question 9 of Paper 1*

The overall performance on this question was good, with 99.45 per cent of candidates scored above 5.5 marks. The analysis revealed that most high-scoring candidates (95.62%) provided a clear introduction, correctly identified causes of the song's leakage and proposed preventive measures. They also provided relevant conclusion. Other candidates, although struggled with their introduction, still accurately explained the causes of the leakage and suggested solutions, ending with a solid conclusion. A few others presented the introduction but included some unclear points and a weaker conclusion. This analysis indicates that these candidates demonstrate adequate knowledge of computer security and privacy. Extract 9.1 presents a sample of correct responses.

9.	
	<p>Piracy refers to the illegal copying of data and information for personal gain. Since Mashaka was planning to release his album at the end of this year, but unfortunately he heard his unreleased album in the city radio. There are some factors that led to the leakage of his song. The following are possible factors which led to the leakage of his song.</p>
	<p>Malware, viruses and spyware. This is the first factor that has caused Mashaka songs to leak. Malware are programs that are installed in the computer without the user consent. Also spyware are sneaky programs that steal data and information from the computer. Hence the presence of Malware, spyware and viruses in the Mashaka's computer has caused leakage of his songs.</p>
	<p>Unauthorized access. Also, some unauthorized people or persons may have gained unauthorized access to Mashaka's computers and hence might have stolen his songs and distributed / released them in the city. So one among the factors for leakage of Mashaka songs is unauthorized access. since some people might have gained unauthorized access on Mashaka computer.</p>
	<p>Renting. This is one of the method or factors of that led to the leakage of Mashaka's songs. Mashaka might have rented his album or hard disk to a friend which contains the lyrics, sound tracks and songs. Hence through renting of either</p>

9	hard disk or album to a friend might have caused the leakage of Mashaka songs in his unreleased album.	
	The following are the ways that could have been used to prevent leakage of Mashaka songs.	
	Use of strong passwords and access controls: In order to prevent Mashaka's songs from leakage, he should use strong passwords and access controls. Strong password is the one that contains symbols, characters and numeric values. Hence in order to prevent Mashaka's songs from leakage then he should have used strong passwords to prevent unauthorized access.	
	Install anti-virus, anti-spyware and anti-malware programs in the computer. The presence of anti-virus, anti-spyware and anti-malware programs helps to scan for the presence of virus, malware and spywares in the computer so as to prevent the leakage of his songs which might have been stolen by malware and spyware in his computer.	
	Legal protection: Mashaka should have registered or protected his unreleased album by the law, so that in case of any leakage of the songs from his album, the law or government could be able to protect him and his songs. So one of the ways that could be used to prevent leakage of his songs is legal protection.	
	Therefore, there are other methods that can be used to protect intellectual property. They include enforcing strong laws, using product key, legal protection, water marking and cracking proofing. Hence you can follow this methods in order to prevent and protect information from leakage or being or copyrighted, or illegal distribution and use of the information.	
	being or copyrighted, or illegal distribution and use of the information.	

**Extract 9.1:** A sample of correct responses to question 9, paper 1

In Extract 9.1, the candidate correctly provided a correct introduction and conclusion and described the issues that led to the song's leakage, as well as ways for preventing.

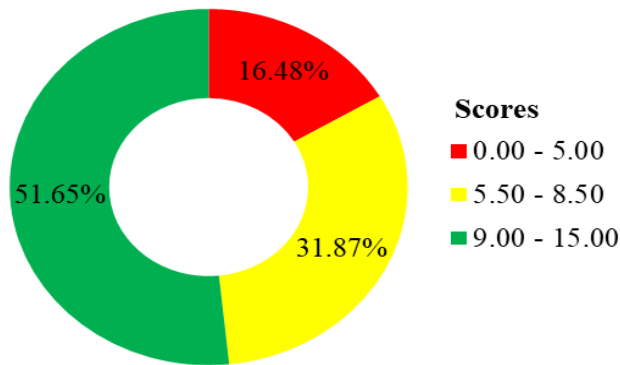
On the other hand, only 3.83% of candidates who scored average marks provided good introductions, clear conclusions, and identified the possible issues that led to the song's leakage, along with suggested preventive measures. However, they failed to offer detailed explanations to support their points. Others did not provide an introduction at all, instead, they repeated the question prompt. The candidates also offered unclear explanations of potential causes of data leakage, ways for preventing it and an ambiguous conclusion. Some candidates confused data leakage with data confidentiality in the introduction. For instance, one candidate wrote, *Confidentiality of data is the ability of data to be accessible to authorized user of data only*. Further analysis shows that some candidates had a good introduction and conclusion but repeated points in different ways. Others described causes of data leakage without proposing any preventive measures.

#### **2.1.10 Question 10: Data Structure and Algorithm**

This was an optional question; the question was as follow.

*Explain three benefits and three limitations of static data structure in developing computer project.*

The statistics show that 182 (86.7%) candidates attempted this question. Out of whom 30 (16.48%) scored from 0 to 5 marks, 58 (31.87%) scored from 5.5 to 8.5 marks and 94 (51.65%) scored from 9 to 15 out of the 15 marks allocated. Figure 10 illustrates the candidates' performance in this question.



**Figure 10:** The Candidates' Performance in Question 10 of Paper 1

The general performance of the candidates in this question was good because 83.52 per cent of the candidates scored above 5.5 marks. The analysis shows that the majority of high-scoring candidates (51.65%) provided a correct introduction and conclusion, and clearly explained both the benefits and limitations of static data structures. However, some candidates correctly explained three benefits but mentions only one accurate limitation. Extract 10.1 shows a sample of a correct response.

10.	Static data structure is the type of data structure that has a fixed size. For example Array which is the collection of elements of the same data type. Other than static data structure there is also dynamic data structure which is the data structure which doesn't have a fixed size as its size can increase or decrease according during run time. The following are the benefits of static data structure
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10.	Easy to access elements	
	for static data structure it is much easier to access elements because the size is fixed and hence the elements are easily accessed. For example, when using array it is easier to access elements by writing its index.	
	Has fixed size. This enhances speed since the computer already allocates specific memory instead of always changing the memory size as it is during using dynamic data structures such as linked lists and other data structures.	
	Easier to Use. This is because for static data structure it is less complicated and easier to understand compared to dynamic data structure which has varying memory size.	
	The following are the limitations of static data structure.	
	Easier to Use. This is because for static data structure it is less complicated and easier to understand compared to dynamic data structure which has varying memory size.	
	The following are the limitations of static data structure.	
	Insufficient Memory. This involves the <del>of declaring</del> allocation of less memory than the memory required. As in one can allocate less memory than required and since the data structure is fixed and not flexible it becomes a problem.	

10.	Memory wastage.	
	One may not require much memory but can allocate large memory and hence lead to memory wastage as in not all that memory will be used and the computer memory may reduce without actually being used.	
	slow. Some programs require dynamic data structure or else the program will be slow and hence become a problem since static data structure contains a fixed size, this may result to hindrances during execution and therefore increase time.	
	Conclusively, Data structures are have various factors to consider before selecting which to be used example there is information to be stored, storage devices, how data is organised and other factors.	

**Extract 10.1:** A sample of correct responses to question 10, paper 1

In Extract 10.1, the candidate provided the clear and accurate introduction and conclusion, and effectively explained the benefits and limitations of static data structures in development of a computer project.

Likewise, the analysis showed that 31.87% of the candidates who scored average marks provided a correct introduction and were able to explain one benefit and one limitation of static data structures in the context of computer project development. In contrast, some candidates presented an incorrect introductions and conclusions but managed to mention two benefits and two

limitations with unclear explanations. These results indicated that while the candidates demonstrate some understanding of static data structures, they struggled to effectively relate their knowledge to real-life applications in computer project development.

Conversely, 16.48 per cent of the candidates scored low marks. Some of these candidates provided a correct introduction and mentioned only one benefit of using data structure in developing a computer project. However, some of them failed to explain limitations and the conclusion in their responses. Further analysis shows that some candidates confused the benefits of using data structure with its limitations. Extract 10.2 presents a sample of incorrect responses.

10.	<p>Static data Structure - are the data that collect and documented in simpler language in a system or computer, are those data that is raw fact.</p> <p>The following are the benefit of static data structure.</p> <p>Its used simple language. static data structure are written in simple language like html that is easy to user to determine the meaning.</p> <p>Its faster to load. due to fact that static data structure does not use complex language that can lead to lower loading when opening.</p> <p>Its inexpensive. static data structure its cost effective compared to dynamic data structure, its cheaper does not need more cost to develop and creating.</p> <p>The following are the limitation or disadvantages of static data structure.</p> <p>Its only changed manually. static data structure never change automatically, only if the developer or administrator change by typing physically.</p>
-----	---

	Its cannot be doing backup if document are deleted. Static dynamic does not retrieve or backup after missed of data because function of one direction.	
	Its does not store data permanently, static data structure deal with temporary information that take short period of time.	
	By conclusion all above are the benefit and limitation of static	

**Extract 10.2:** A sample of incorrect responses to question 10, paper 1

In Extract 10.2, the candidate gave irrelative introduction and conclusion, also faced difficulties in explaining the benefits and limitations of using static data structure in developing of a computer project.

## 2.2 136/2 Computer Science 2

This was a practical examination paper that lasted for 3 hours. The paper consisted of three questions, out of which candidates were required to answer two questions. Question one was compulsory. Each question carried 25 marks, making a total of 50 marks.

### 2.2.1 Question 1: C++ Programming

- (a) The candidates were required to use the C++ programming language to develop a program that would enable Hope Secondary School to automate the student promotion system to higher classes. The question was as follows:

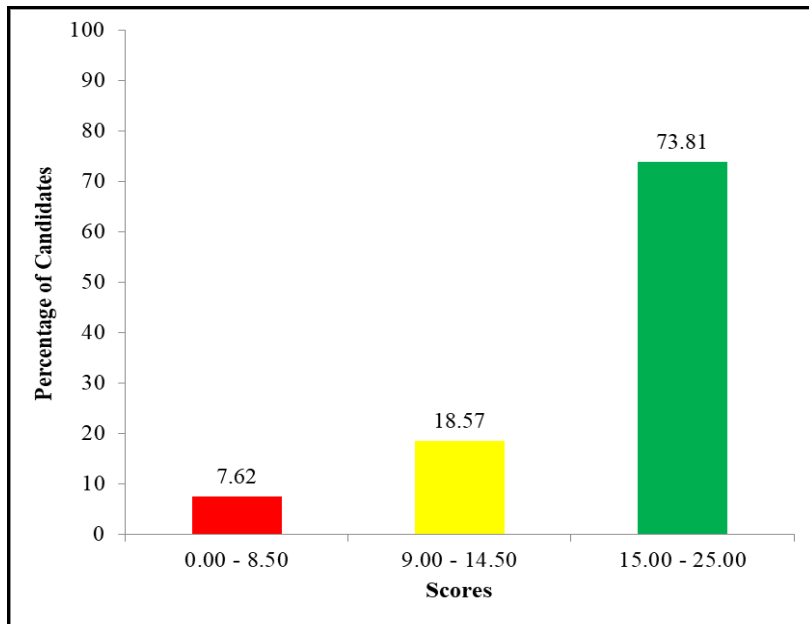
*The Director of Hope secondary school wants to automate the system for students to join the upper class. The school has been using manual system to enforce the students to pass by-laws. Recently, this system has become less efficient due to the increased number of students' enrolment. The pass marks in each subject is 40% and a student must pass at least two subjects out of three to join the higher class. Develop a C++ program that will enable the school to achieve the goal. The program should:*

- (i) *prompt a user to input registration number, name, and marks of three subjects for five students.*

- (ii) *display the total number and names of students who qualified to join the higher class.*
  - (iii) *display the total number and names of students who failed to join the higher class.*
- (b) The candidates were required to use C++ programming language to develop a program that would enable the UMOJAWETU Company to analyze and track the monthly profit of its salesmen's over the course of a year. The question was as follows:

*A Tax officer at UMOJAWETU Company wants to analyze and track the monthly salesmen's profit at the end of the year. Due to the large number of salesmen in the company, manual analysis and tracking of profit data become challenging. The sales manager of the company consulted you to assist automating a process. Develop a C++ program that accepts the monthly profit made by each salesman. Your program should also compute and display the total profit made per year for each salesman and the maximum total profit made per year among all salesmen. (HINT: The manager provided three salesmen as a case study).*

A total of 210 (100%) candidates attempted this question. Whereas 16 (7.62%) scored from 0 to 8.5 marks, 39 (18.57%) scored from 9 to 14.5 marks, and 155 (73.81%) scored from 15 to 25 out of the 25 marks allocated. Figure 11 illustrates the candidates' performance in this question.



**Figure 11:** Shows Candidates' Performance on Question 1 of Paper 2

The candidates' overall performance in this question was good, with 92.38 percent scored from 9 to 25 marks. Analysis of their responses showed that 73.81 percent of the candidates who scored high marks, correctly used the C++ programming language to develop a program that automates the system for students to join the higher class in part (a). Some of the candidates correctly used arrays to design the program which prompted a user to input registration number, name, and marks of three subjects for five students and displayed the total number and names of students who qualified and those who failed to join the higher class. For example, one candidate declared *int mark[3]; int reg[5]; string name[5]; int G, int m, int qualified = 0, int failed = 0*. Moreover, another candidate wrote *cin<<regno[i], cin<<stname[i] and cin<<score[i]* to capture registration number, name, and marks of three subjects for five students respectively.

Similarly, some of the candidates correctly implemented loops and conditional statements to calculate and display the qualified and failed students to join the higher class. For example, one candidate wrote *for (int i = 0; i < 5; i++)* and *for(int i = 0; i < 3; i++)* loops in order to limit the number of students and subjects respectively. Likewise, the candidates correctly wrote an *if* statement to identify students who scored 40 per cent

or above in at least two subjects. In part (b), candidates correctly developed a program that accepts the monthly profit made by three salesmen by prompting user to enter the monthly profit for each salesman. Their program computed and displayed the total profit made per year for each salesman and the maximum total profit made per year among all salesmen. The candidates demonstrate appropriate use of array to declare and initialize variables. For example, some of the candidates wrote *double p[12], double total=0, double maximum, int i, int j.*

Moreover, the candidates correctly applied the formula and condition to compute the total annual profit for each salesman. A commonly used expression among the candidates was *total = total + p[i]*; which was used to calculate the sum of a salesman's monthly profit over the year. To determine the highest annual profit among the three salesmen, many candidates applied the condition *total > maximum*. As the results, the program successfully displayed the maximum annual profit. Extract 11.1 presents a sample of correct responses from one of the candidates.

```

1 #include<iostream>
2 using namespace std;
3 int main()
4 {
5     int x[5],mark1[5],mark2[5],mark3[5],y=0,z=0;
6     string name[5],grade[5];
7     for(int i=0;i<5;i++)
8     {
9         cout<<"Enter registration number for student "<<i+1<<" : ";
10        cin>>x[i];
11        cout<<"Enter name of student "<<i+1<<" : ";
12        cin>>name[i];
13        cout<<"Enter marks of subject 1: ";
14        cin>>mark1[i];
15        cout<<"Enter marks of subject 2: ";
16        cin>>mark2[i];
17        cout<<"Enter marks of subject 3: ";
18        cin>>mark3[i];
19        if((mark1[i]>=40 && mark2[i]>=40) || (mark1[i]>=40&&mark3[i]>=40)||mark2[i]>=40 && mark3[i]>=40)
20        {
21            grade[i]="pass";
22            y++;
23        }
24        else
25        {
26            grade[i]="fail";
27            z++;
28        }
29    }
30    cout<<"The total Number who qualified to join the higher class ="<<y<<endl;
31    cout<<"Their Names are "<<endl;
32    for(int i=0;i<5;i++)
33    {
34        if(grade[i]=="pass")
35        {
36            cout<<name[i]<<endl;
37        }
38    }
39    cout<<endl;
40    cout<<"The total Number who failed to join the higher class ="<<z<<endl;
41    cout<<"Their Names are "<<endl;
42    for(int i=0;i<5;i++)
43    {
44        if(grade[i]=="fail")
45        {
46            cout<<name[i]<<endl;
47        }
48    }
49    return 0;
50 }

```

```
Enter registration number for student 1 : 001
Enter name of student 1 : Herena
Enter marks of subject 1: 34
Enter marks of subject 2: 56
Enter marks of subject 3: 78
Enter registration number for student 2 : 002
Enter name of student 2 : Peter
Enter marks of subject 1: 23
Enter marks of subject 2: 26
Enter marks of subject 3: 40
Enter registration number for student 3 : 003
Enter name of student 3 : Fatuma
Enter marks of subject 1: 23
Enter marks of subject 2: 89
Enter marks of subject 3: 41
Enter registration number for student 4 : 004
Enter name of student 4 : Joseph
Enter marks of subject 1: 90
Enter marks of subject 2: 68
Enter marks of subject 3: 50
Enter registration number for student 5 : 005
Enter name of student 5 : Saida
Enter marks of subject 1: 26
Enter marks of subject 2: 16
Enter marks of subject 3: 39
The total Number who qualified to join the higher class =3
Their Names are
Herena
Fatuma
Joseph

The total Number who failed to join the higher class =2
Their Names are
Peter
Saida

-----
Process exited after 86.94 seconds with return value 0
Press any key to continue . . . |
```

```

1  #include<iostream>
2  using namespace std;
3  int main(){
4      int num=3;
5      double max_profit=0;
6      double totalprofit[num];
7      int max_sman;
8      double m_profit;
9
10     cout<<"*****A program to calculate the montly salesman profit at the end of the year*****\n\n";
11     for(int i=0;i<num;i++){
12         cout<<"Enter Profit for each month for salesman "<<i+1<<" endl;
13
14         for(int j=0;j<12;j++){
15             cout<<"Enter Profit(In Tshs) for month  "<<j+1<<": ";
16             cin>>m_profit;
17             totalprofit[i]= totalprofit[i]+m_profit;
18         }
19
20         if( totalprofit[i] >= max_profit){
21             max_profit = totalprofit[i] ;
22             max_sman=i+1;
23         }
24         cout<<"\n\n";
25     }
26 }
27
28 cout<<"*****ANNUAL TOTAL PROFIT FOR EACH SALES MAN*****\n\n";
29 for(int k=0;k<num;k++){
30
31     cout<<"Total Profit made per year for salesman "<<k+1<<": "<<totalprofit[k] <<"Tshs" <<endl;
32 }
33
34 cout<<"\n*****THE MAXIMUM TOTAL PROFIT AMONG ALL SALESMEN\n\n";
35 cout<<"The maximum sales profit was with salesman "<<max_sman<<endl;
36 cout<<"Maximum total profit is "<<max_profit <<"Tshs";
37 }

```

```

Enter Profit for each month for saleman 1
Enter Profit(In Tshs) for month 1: 200
Enter Profit(In Tshs) for month 2: 500
Enter Profit(In Tshs) for month 3: 300
Enter Profit(In Tshs) for month 4: 400
Enter Profit(In Tshs) for month 5: 500
Enter Profit(In Tshs) for month 6: 800
Enter Profit(In Tshs) for month 7: 611
Enter Profit(In Tshs) for month 8: 352
Enter Profit(In Tshs) for month 9: 24
Enter Profit(In Tshs) for month 10: 25
Enter Profit(In Tshs) for month 11: 265
Enter Profit(In Tshs) for month 12: 54

Enter Profit for each month for saleman 2
Enter Profit(In Tshs) for month 1: 658
Enter Profit(In Tshs) for month 2: 654
Enter Profit(In Tshs) for month 3: 685
Enter Profit(In Tshs) for month 4: 658
Enter Profit(In Tshs) for month 5: 658
Enter Profit(In Tshs) for month 6: 658
Enter Profit(In Tshs) for month 7: 658
Enter Profit(In Tshs) for month 8: 658
Enter Profit(In Tshs) for month 9: 369
Enter Profit(In Tshs) for month 10: 325
Enter Profit(In Tshs) for month 11: 254
Enter Profit(In Tshs) for month 12: 214

Enter Profit for each month for saleman 3
Enter Profit(In Tshs) for month 1: 5243
Enter Profit(In Tshs) for month 2: 548
Enter Profit(In Tshs) for month 3: 245
Enter Profit(In Tshs) for month 4: 213
Enter Profit(In Tshs) for month 5: 658
Enter Profit(In Tshs) for month 6: 562
Enter Profit(In Tshs) for month 7: 685
Enter Profit(In Tshs) for month 8: 623
Enter Profit(In Tshs) for month 9: 658
Enter Profit(In Tshs) for month 10: 300
Enter Profit(In Tshs) for month 11: 500
Enter Profit(In Tshs) for month 12: 600

*****ANNUAL TOTAL PROFIT FOR EACH SALES MAN*****

Total Profit made per year for salesman 1:4031Tshs
Total Profit made per year for salesman 2:6449Tshs
Total Profit made per year for salesman 3:10835Tshs

*****THE MAXIMUM TOTAL PROFIT AMONG ALL SALESMEN

The maximum sales profit was with salesman 3
Maximum total profit is 10835Tshs
-----
Process exited after 74.82 seconds with return value 0
Press any key to continue . . .

```

**Extract 11.1:** A sample of correct responses to question 1, paper 2

In Extract 11.1, the candidate correctly developed an automated system that allows students to join the upper class in part (a). In part (b), the candidate also successfully created an automated system that analyzes and tracks the monthly profits of salespeople throughout the year.

Further analysis showed that (18.57%) of the candidates who scored average marks correctly created a C++ program in part(a) that allows a user to enter the registration number, name, and marks for three subjects for five students. However, they failed to use appropriate control structures such as (for loop, while loop and if statements). For example, one candidate wrote switch statement for data input: `switch(mark) {cout<<"enter choice"<<endl; cin>>mark;` instead of writing the correct syntax which is `cout<<"Enter marks for subject"<<i +1<<endl;` and `cin>>marks[i];`. However, some of the candidates faced difficulties in writing formula using array concept and control structures to compute total profit and maximum total profit made per year among all salesmen in part (b). For example, one candidate wrote `totalprofit=monthlyprofit*12;` instead of writing `total = total + sales[i][j];` which was the correct formula. This shows that the candidate lacked knowledge about the uses of control structures and arrays in C++ Programming language.

On the other hand, statistics show that 7.62 per cent of the candidates scored low marks. Most of the candidates failed to declare and initialize variables correctly using array concept in part (a). However, the candidates in this category correctly wrote the header files (pre-processors) such as `#include<iostream>` and `using namespaces std;` as well as writing a proper main function that is `"int main( ){ }`". Some of the candidates also failed to use the declared variables in the main function. For example, one candidate declared `tmarks` but used `marks` in main function. Furthermore, some candidates failed to use C++ input statements `cin<<name[i]` to capture students' names, `cin<<regno[i]` to capture students' registration number and `cin<<mark[i]` to capture marks of three subjects. In part (b), some of the candidates failed to declare variables using arrays. Others failed to use control structures to compute maximum profit per year for all three salesmen and compare total profit made per year among all three salesmen. This indicates that the candidates had insufficient knowledge about C++

programming language, control structures and array. Extract 11.2 shows a sample of incorrect responses from one of the candidates.

```
1  #include<iostream>
2  using namespace std;
3  int main()
4  {
5      int profit,monthlyprofit,profitperyear;
6      cout<<"Enter the profit per day"<<endl;
7      cin>>profit;
8      monthlyprofit=profit*30;
9      cout<<"Your monthly profit is"<<"\t"<<monthlyprofit<<endl;
10     profitperyear=monthlyprofit*12;
11     cout<<"Your profit per year is"<<"\t"<<profitperyear;
12
13 }
14
```

```
Enter the profit per day
2
Your monthly profit is 60
Your profit per year is 720
-----
Process exited after 5.568 seconds with return value 0
Press any key to continue . . . |
```

**Extract 11.2:** A sample of incorrect responses to question 1, paper 2

In Extract 11.2, part (b) of the question is shown, where the candidate used an incorrect formula, resulting in an incorrect output.

### 2.2.2 Question 2: Website Development

This question had two parts: (a) and (b). The candidates were required to use both HTML and JavaScript to develop a web-based system for managing car parking space. The question was stated as follows:

*To solve the challenge of car parking space, the ABC Company decided to build parking garage in different areas of urban cities in Tanzania. The company charges Tshs 500 as a minimum fee per hour. If a car parked for more than one hour but less than 24 hours, charges of Tshs 200 is paid. Otherwise, additional of Tshs 2000 is paid if a car parked for more than 24*

hours. You have been consulted by a company to develop a web-based system for managing the parking;

(a) Use HTML to create the interface provided in Figure 1.

**Caution: Price for Parking:**

- Charges for One Hour is TShs 500
- Additional charges of TShs 200 is added for every hour after the first one hour.
- Additional charge of TShs 2000 is added to the cost if the time spent exceed 24 hours.

---

**Please Fill Your Information Here**

Enter Your TIN Number:

Enter Your Name:

Enter Number of Hour:

---

Your Receipt is:

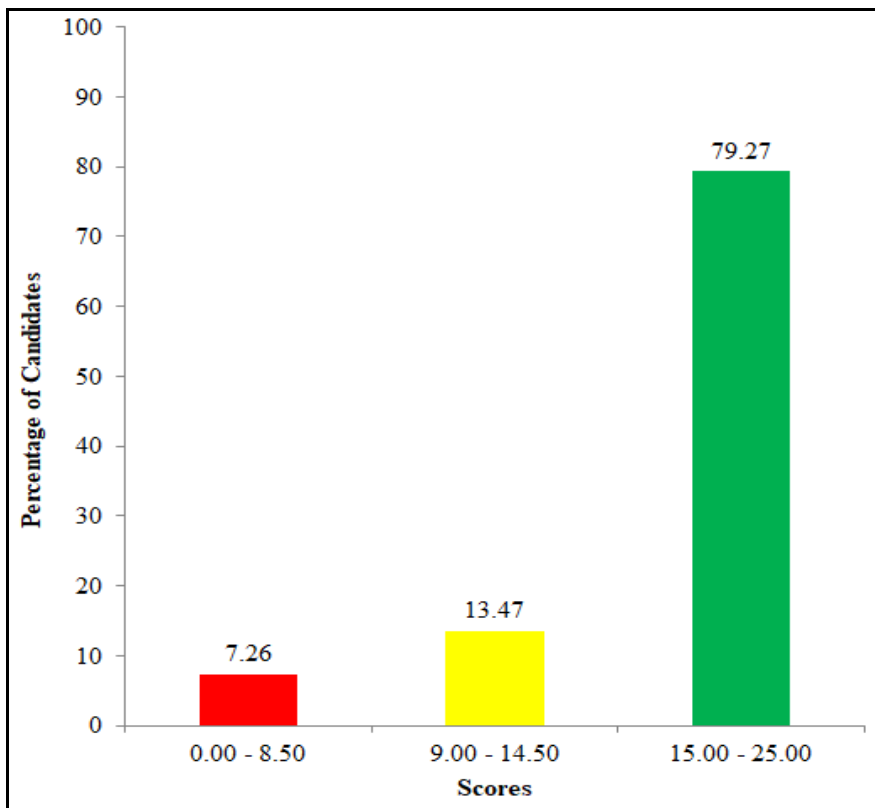
**Figure 1**

### ***Descriptions***

- The colour, font style and the size of the texts “Caution: Price for Parking” should be red, “Bookman Old Style” and heading 2 respectively.*
- The font colour style and size of the texts “Please Fill Your Information Here” to blue and “Bookman Old Style” and heading 1 respectively.*
- The size, colour, and width of the first horizontal line should be 8, “CC9933” and 1000, respectively.*
- The size, width and color of the second horizontal line should be 7, 1000 and “6666ff”, respectively.*
- The table border should be 3.*

(b) Use JavaScript to activate the “Calculate” button in Figure 1 so that the program validates user inputs and computes the parking charges and display the output under the texts “Your Receipt is:”

A total of 193 (91.9%) candidates attempted this question. Out of whom, 14 (7.26%) scored from 0 to 8.5 marks, 26 (13.47%) scored from 9 to 14.5 marks and 153 (79.27%) scored from 15 to 25 marks out of 25 marks allocated. Figure 12 illustrates the candidates’ performance on this question.



**Figure 12:** Shows Candidates’ Performance on Question 2 of Paper 2

The general performance of candidates in this question was good, as 92.75 per cent scored above 8.5 marks. The analysis of candidates’ responses showed that 79.27 per cent achieved high marks. In part(a), most of the candidates correctly created the required interface by applying HTML code for headings (with relevant attributes), unordered lists, and horizontal lines (with relevant attributes). They also designed an effective form, utilized

non-breaking spaces (&nbsp;), and used tables to align text boxes and buttons neatly.

In part (b), the candidates correctly applied JavaScript to activate the form developed in part (a), enabling the program to validate user inputs, compute parking charges, and display the output under the text “Your Receipt is”. However, a few candidates failed to implement proper input validation or displaying the calculated charges within the appropriate HTML element. For example, one candidate wrote *document.getElementById("m").innerHTML=m* instead of writing *document.getElementById("m").innerHTML=m;* for displaying output charges *m* in an element with id = “m”. This led them to lose some marks. Extract 12.1 presents a sample of correct response from one of the candidates.

```
<!DOCTYPE html>
<html>
<head><title>number2</title>
<script>
function calc()
{
var name,hrs,Tnum,charge,total,mincharge;
name = document.getElementById("name").value;
Tnum = document.getElementById("num").value;
hrs = document.getElementById("hrs").value;
mincharge=500;
charge;
total;
if(name=="||hrs=="||Tnum=="")
{
alert("Fill in the information")
}
else if(hrs>1&&hrs<=24)
{
charge=200*(hrs-1);
total=mincharge+charge;
}
else if(hrs>24)
{
charge=200*(hrs-1);
total=2000+charge+mincharge;
}
}
```

```

else if(hrs==1)
{
    total=mincharge;
}
else
{
    alert("Charges are provided above 1 hour only")
}
    document.getElementById("results").innerHTML=total;
}
</script></head>
<body><center>
<fieldset>
<h2>
    <font face="Bookman Old style" color="red">Caution:Price
    for Parking</font>
<h2>
<table border="3">
<td>
<ul>
<li>Charges for One Hour is TShs.500</li>
<li>Additional charges of TShs.200 is added for every hour
    after the first one hour</li>
<li>Additional charge of TShs.2000 is added to the cost if the
    time spent exceed 24 hours</li>
<td>
</ul>
</td>
</table>
<hr size="8" width="1000" color="CC9933">
<h1>
    <font color="blue" face="Bookman Old style">Please Fill
    Your Information Here</font>
</h1>
<form>
<table>
<tr><td>Enter Your TIN Number:</td><td><input type="text" id="num"
placeholder="Enter Your Tin Number here"></td></tr>
<tr><td>Enter Your Name:</td><td><input type="text" id="name"
placeholder="Enter full name"></td></tr>
<tr><td>Enter Number Of Hour:</td><td><input type="text" id="hrs"
placeholder="Enter your number of hours"></td></tr>
</table>
<input type="button" onclick="calc()" value="Calculate">
<hr size="7" width="1000" color="6666ff">
<p >Your Receipt is:</p>
<p id="results"></p></center>
</form>
</fieldset>
</body>
</html>

```

**Caution:Price for Parking**

- Charges for One Hour is TShs.500
- Additional charges of TShs.200 is added for every hour after the first one hour
- Additional charge of TShs.2000 is added to the cost if the time spent exceed 24 hours

---

**Please Fill Your Information Here**

Enter Your TIN Number:

Enter Your Name:

Enter Number Of Hour:

---

Your Receipt is:

7300

**Extract 12.1:** Sample of correct response to question 2, Paper 2

In Extract 12.1, the candidate correctly typed the HTML code required to create a web-based parking management system that accepts the necessary inputs in part (a). In part (b), the candidate activated the form by writing JavaScript that ensures all text boxes are filled and that the Calculate button computes the charges and displays the results under the text “Your Receipt is.”

Likewise, 13.47 percent of the candidates who scored average marks correctly designed the interface for the “Web-based system for managing parking” using HTML tags and their respective attributes in part (a). However, a few candidates used incorrect tags to display an unordered list within a table. Others inserted the list manually using full-stop characters (.). For example, one candidate wrote: `<table><tr><td> <p>. Charges for one hour is Tsh 500 </p></td></tr></table>` instead of `<table><tr><td> <ul><li>Charges for one hour is Tsh 500 </li></ul></td></tr></table>`.

In part (b), most of the candidates wrote incorrect JavaScript codes that validates user inputs and computes the parking charges and display the output. For example, one candidate wrote `function add( );{ }` instead of `function add( ){ }` which failed to execute the function. On top of that, some

candidates did not include JavaScript codes in their work at all. This indicates that some candidates had insufficient knowledge about JavaScript. Further analysis shows that (7.26%) of the candidates scored low marks. In part (a), most of these candidates were unable to type correctly HTML codes for headings with their respective attributes, unordered lists, horizontal lines and form elements. For example, one candidate wrote `<td>input type="text" value="enter your tin number here" id+"Number"></td>` instead of `<td><input type="text" placeholder=" Enter your tin number here" id="number"></td>` for creating input box in a form. However, a few candidates were able to use some of form elements such as labels and text fields to capture user inputs and type correctly HTML tags. In part (b), most of the candidates failed to type conditional statements, validate user inputs, or implement formulas to calculate charges. For example, one candidate incorrectly wrote `if(1>hrs>24){...}` instead of `if(hrs>1 && hrs <24) {...}` to check if the input hour value fails within the required range. In addition, some candidates were not able to write any JavaScript codes at all. This indicates that these candidates had insufficient knowledge of JavaScript programming. Extract 12.2 presents a sample of an incorrect response from one of the candidates.

```

<html>
<h1><bgcolor="red">caution:price for parking</h1></br>
<table border="2">
<p>.charge for one Hour is TShs 500</p>
<p>.additional charges of TShs 200 is added for every hour after the first one hour.</p>
<p>.additional charge of TSh 2000 is added to the cost if the time spent exceed 24 hours</p>
</table>
<h2><bgcolor="blue">Please Fill your Information Here</h2></br>
<p>Enter Your Tin Number <button type="enter your Tin number here">Enter your Tin number</p></button>
<p>Enter your name <button type="Enter your name">Enter your fuul name</p></button>
<p>Enter Nmber of Hou <button type="Enter your number of hours">Eter your number of hours</p></button>
<td><center><button type="calculate">calculate</button></center>
</table>
</html>

```

**caution:price for parking**

.charge for one Hour is TShs 500  
.additional charges of TShs 200 is added for every hour after the first one hour.  
.additional charge of TSh 2000 is added to the cost if the time spent exceed 24 hours  
.

**Please Fill your Information Here**

Enter Your Tin Number

Enter your name

Enter Nmber of Hou

**Extract 12.2:** A sample of incorrect response to question 2, Paper 2

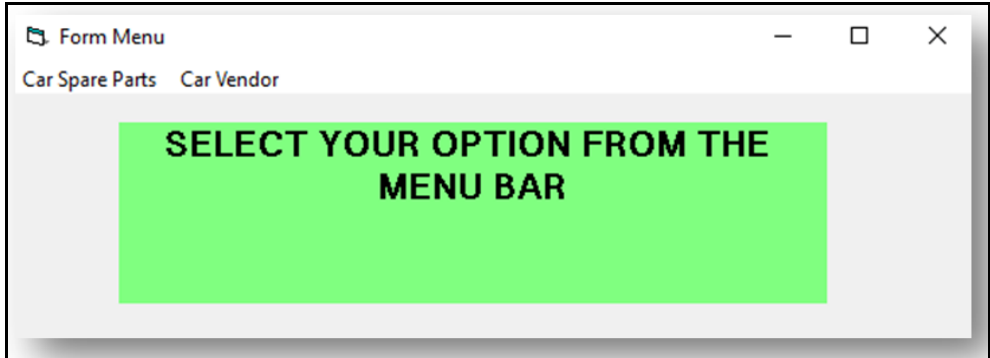
In Extract 12.2, the candidate failed to apply appropriate color to the headings and omitted the correct tags for unordered lists and input fields in part (a). Specifically, the candidate used `<button>` tags instead of `<input type="...">` tags. In part (b), the candidate did not provide any JavaScript codes.

### 2.2.3 Question 3: Visual Programming

The question was designed to assess the candidate's ability to design a sales management system by using Microsoft Visual Basic Program and Microsoft Office Access Database. The question was as follows:

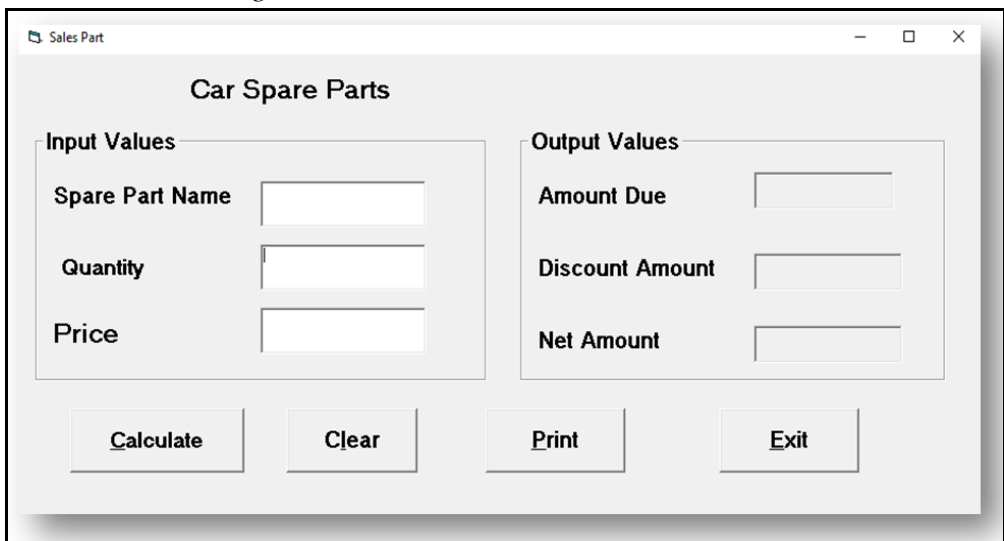
*Watakazini Company is doing business of selling cars and car spare parts. The company offers a 15 percent discount once a customer purchased a large quantity of spare parts. Currently, the company is using manual approach to perform computations which causes delay in providing service to customers. Suppose the company manager consulted you to develop an automation system for sales management, using a Visual Basic programming, develop a system for the company.*

(a) Create an interface as shown in Figure 2.



**Figure 2**

(b) Activate the “Car Spare Parts” menu in Figure 2 to display interface as shown in Figure 3 when a user clicks it.

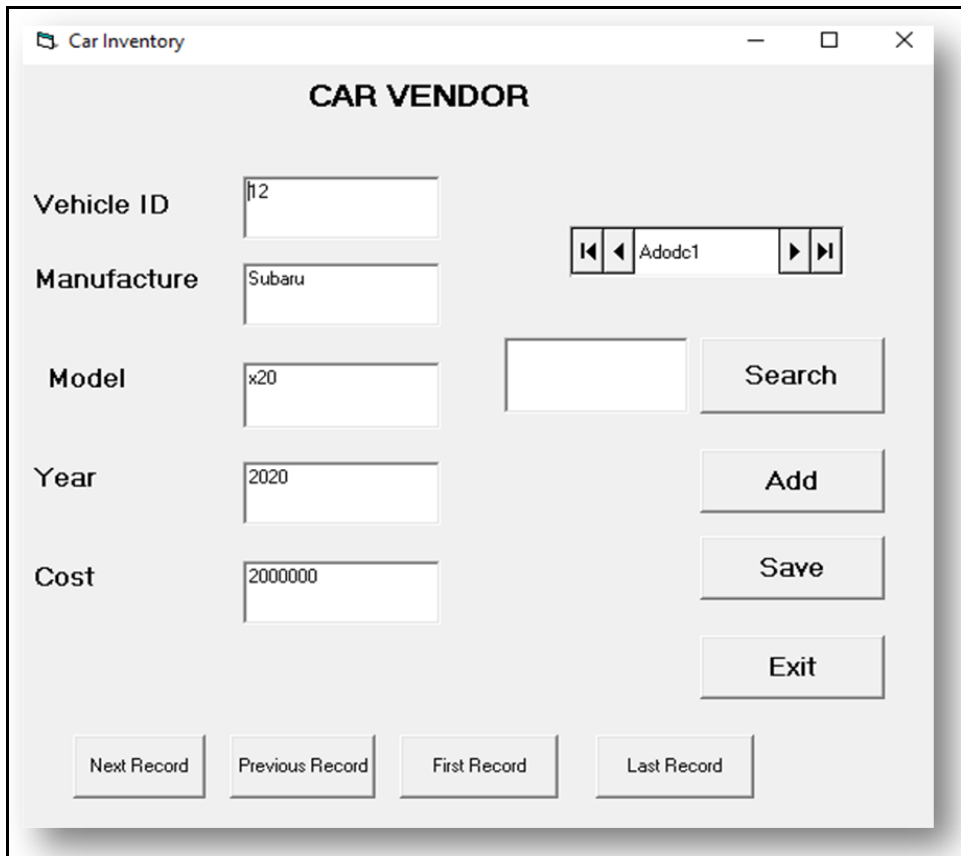


**Figure 3**

(c) Activate the Calculate, Clear, Print and Exit buttons in Figure 3, so that:

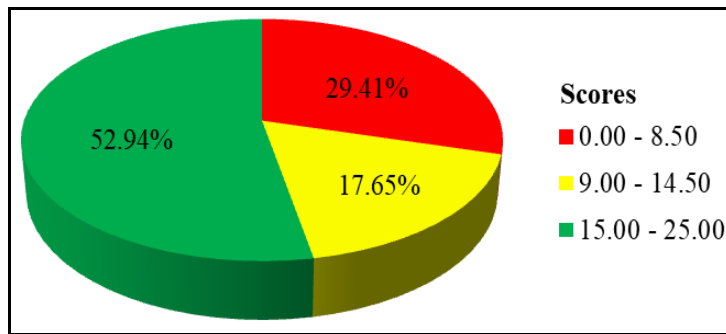
- (i) The discount and net amount are displayed in the respective labels after clicking the “calculate” button. (**HINT:** Net amount = Amount due - Discount amount).
- (ii) The entered data is cleared from the form when the user clicks the “Clear” button.
- (iii) The form is closed after clicking the “Exit” button.

- (iv) The summary report is printed in the form of message box after clicking the “Print” button.
- (d) Create a database called “customer” using MS Access and add a table called “vehicle” with fields shown in Figure 4.
- (e) Activate the “Car Vendor” menu in Figure 2 to display the interface in Figure 4. The interface allows the company to add customer details to the customer database.
- (f) Activate the buttons Search, Add, Save and Exit in Figure 4 to perform their intended task.



**Figure 4**

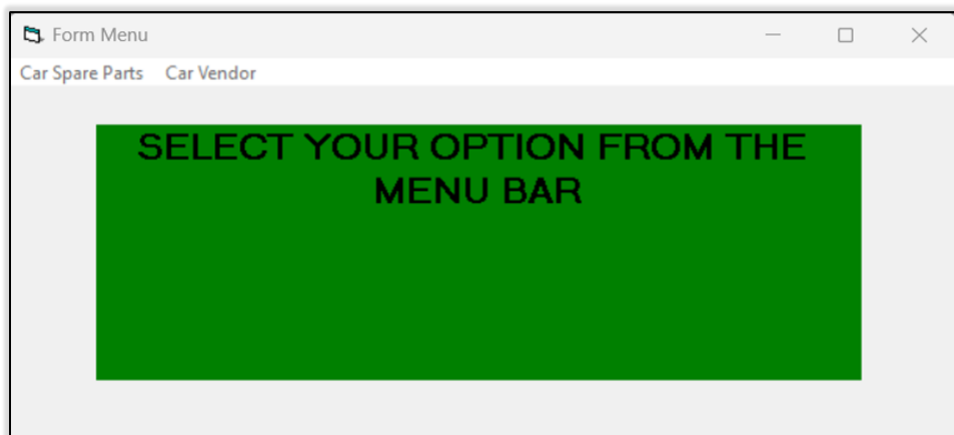
Few candidates 17 (8.10%) attempted this question. Whereas 5 (29.41%) scored from 0 to 8.5 marks, 3 (17.65%) scored from 9 to 14.5 marks, and 9 (52.94%) scored from 15 to 25 out of the 25 marks allocated. Figure 13 presents the candidate’s performance in this question.



**Figure 13:** Shows Candidates' Performance on Question 3 of Paper 2

The overall performance of candidates in the given question was good, as (70.59%) per cent scored above 9 marks. The analysis showed that the 52.94% of the candidates who scored high marks correctly designed the interfaces given in Figure 2, 3 and 4, incorporating the required text boxes, buttons, labels, and “customer” database. These candidates also correctly activated “Car Spare Parts” and “Car Vendor” menus to display their corresponding forms. Additionally, they correctly implemented the functionality of the “Calculate”, “Clear”, “Print” and “Exit” buttons in “sales form” as shown in Figure 3.

Some candidates also applied appropriate code to activate all buttons in the Car Inventory form. However, a few of them encountered challenges in connecting the data grid to the Microsoft Office Access database and failed to activate the “Search” button in the interface shown in Figure 4. Extract 13.1 presents a sample of a correct response from one of the candidates.



```
Private Sub carspares_Click()  
Form2.Show  
Form1.Hide  
End Sub
```

```
Private Sub vendors_Click()  
Form2.Hide  
Form1.Hide  
Form3.Show  
End Sub
```

Sales Part

### Car Spare Parts

Input Values	Output Values
Spare Part Name <input type="text" value="Radiator cap"/>	Amount Due <input type="text" value="6000"/>
Quantity <input type="text" value="3"/>	Discount Amount <input type="text" value="900"/>
Price <input type="text" value="2000"/>	Net Amount <input type="text" value="5100"/>

```

Public prices As Currency
Public quantities As Integer
Public sparename As String
Private Sub Command1_Click()
Dim amount As Currency
Dim discount As Currency
Dim net As Currency

prices = Val(Price.Text)
quantities = Val(Quantity.Text)
sparename = Spare.Text

Amounttext.Text = prices * quantities
Discounttext.Text = Val(Amounttext.Text) * 0.15
Nettext.Text = Val(Amounttext.Text) - Val(Discounttext)

End Sub
Private Sub Command2_Click()
Spare.Text = ""
Quantity.Text = ""
Price.Text = ""
Amounttext.Text = ""
Discounttext.Text = ""
Nettext.Text = ""
End Sub
Private Sub Command3_Click()
prices = Val(Price.Text)
quantities = Val(Quantity.Text)
sparename = Spare.Text
If Spare.Text = "" And Quantity.Text = "" And Price.Text = "" And Amounttext.Text = "" Then
MsgBox ("Please fill in the required info")
Else
MsgBox "Spare part name:" + sparename + "Quantity:" + Str(quantities) + "Price:" + Str(prices)
+"Amount Due:" + Amounttext + "Discount Amount:" + discounttext + "Net Amount:" + Nettext, vbOKOnly, "Summary Report"
End If
End Sub

Private Sub Command4_Click()
End
End Sub

```

Car Inventory

### CAR VENDOR

Vehicle ID	<input type="text" value="12"/>		<input type="text" value="Adodc1"/>
Manufacture	<input type="text" value="IST"/>	<input type="text"/>	<input type="button" value="Search"/>
Model	<input type="text" value="nyahenge24"/>		<input type="button" value="Add"/>
Year	<input type="text" value="2001"/>		<input type="button" value="Save"/>
Cost	<input type="text" value="1500000"/>		<input type="button" value="Exit"/>
<input type="button" value="Next Record"/> <input type="button" value="Previous Record"/> <input type="button" value="First Record"/> <input type="button" value="Last Record"/>			

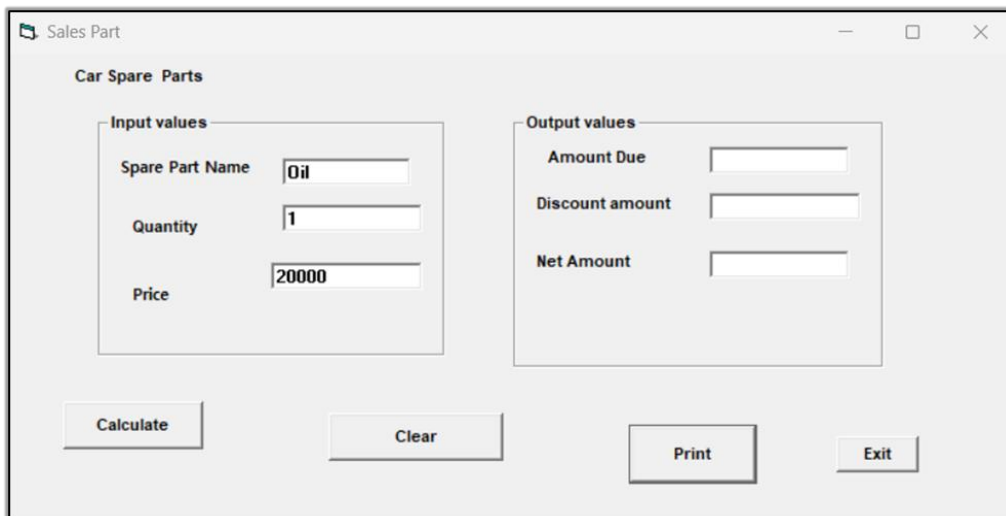
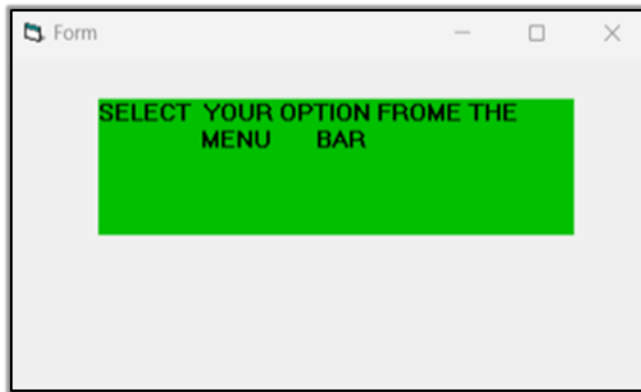
<pre> Private Sub Command1_Click() Adodc1.Recordset.MoveFirst If (Text1.Text &lt;&gt; Text6.Text) Then Adodc1.Recordset.MoveNext End If End Sub </pre>
<pre> Private Sub Command2_Click() Adodc1.Recordset.AddNew End Sub </pre>
<pre> Private Sub Command3_Click() Adodc1.Recordset.Save End Sub </pre>
<pre> Private Sub Command4_Click() End End Sub </pre>
<pre> Private Sub Command5_Click() Adodc1.Recordset.MoveLast End Sub </pre>
<pre> Private Sub Command6_Click() Adodc1.Recordset.MoveFirst End Sub </pre>
<pre> Private Sub Command7_Click() Adodc1.Recordset.MovePrevious End Sub </pre>
<pre> Private Sub Command8_Click() Adodc1.Recordset.MoveNext End Sub </pre>

**Extract 13.1:** A sample of correct responses to question 3, paper 2

In Extract 13.1, the candidate correctly applied Visual Basic codes to design the given interfaces and also activated all buttons.

Statistics show that (29.41%) of the candidates scored low marks. Most of these candidates failed to add and activate two menus labeled “Car Spare Parts” and “Car Vendor” on “Menu Form”. Some of the candidates did not include labels for displaying output in “Output Values” frame and didn’t add codes to activate “Calculate”, “Clear”, “Print” and “Exit” buttons in the “Sales Part” form. Additionally, the candidates failed to add “Adode”

component in the form, and codes that activate all eight buttons in the “Car Vendor” form due to lack of knowledge of linking Visual Basic and Microsoft office access database. However, all candidates correctly designed “Sales Part” form interface and “Car Vendor” form interface by adding all buttons, textboxes, labels and frames. Extract 13.2 shows a sample of the incorrect responses of interface and their codes.



A screenshot of a window titled "Sales Part". The window contains a form titled "Car Spare Parts". The form is divided into two main sections: "Input values" and "Output values".

**Input values:**

- Spare Part Name:
- Quantity:
- Price:

**Output values:**

- Amount Due:
- Discount amount:
- Net Amount:

At the bottom of the form, there are four buttons: "Calculate", "Clear", "Print", and "Exit".

```

Private Sub Label9_Click()
End Sub

Private Sub Command1_Click()
End Sub

Private Sub Command5_Click()
End Sub

Private Sub Command7_Click()
End Sub

Private Sub Form_Load()
End Sub

```

**Extract 13.2:** A sample of incorrect responses to question 3, paper 2

In Extract 13, the candidate applied Visual Basic concepts to design the given interfaces but failed activate all inputs in the form and buttons.

### **3.0 PERFORMANCE OF THE CANDIDATES PER TOPIC**

The analysis of each topic revealed that, the candidates performed well in nine topics and weak in one topic. The candidates performed well in the topics of *Computer Security and Privacy* (99.45%), *Data Communication and Networking* (99.05%), *C++ Programming* (93.81%), *Computer Basics* (91.43%), *IT Environment* (90.95%), *Data Structure and Algorithms* (83.52%), *Website Development* (81.38%), *Visual Programming* (68.63%) and *Data Representation* (66.67%). This good performance is largely attributed to correct interpretation of questions and the candidates' strong practical skills.

The weak performance was noted in the topic of *Systems Development*, with only 30.91 per cent of candidates performed well, highlights a significant knowledge gap. This discrepancy suggests that while candidates may excel in practical applications, they generally lack a deeper understanding of theoretical concepts specifically, the role of the key person involved in system development and their responsibilities.

The *appendix* presents candidates' performance by topic in both Paper 1 and Paper 2, highlighting areas of strength as well as those requiring improvement. Addressing the identified gaps will be crucial for promoting balanced and comprehensive subject mastery. Also, it will help to prepare candidates for both practical and theoretical challenges in the field of Computer Science.

### **4.0 CONCLUSION AND RECOMMENDATIONS**

#### **4.1 Conclusion**

The analysis of the candidates' performance in Computer Science in ACSEE 2025 examination shows that out of ten topics assessed, nine recorded good performances, while one topic registered weak performance. Therefore, the overall performance in Computer Science for the year 2025 was considered good. However, the analysis of the candidates' responses revealed significant difficulties in answering questions related to the topic of System Development. The weak performance in this topic is attributed to the candidates' inadequate knowledge of the key personnel involved in system development and their respective roles.

## **4.2 Recommendations**

In order to improve the candidates' performance in the future Computer Science examinations, the following recommendations are made:

- (a) Teachers should guide students in identifying and describing the roles of each person involved in system development.
- (b) Teachers should give students regular exercises and tests to improve their essay writing skills, with particular emphasis on writing clear and coherent introductions and conclusions.
- (c) Students should be encouraged to engage in extensive practice especially in the areas where weaknesses were identified to strengthen their confidence and mastery of the subject matter.

**APPENDIX**

**Analysis of Candidates' Performance per Topic**

S/N	Topic	Question Number	Percentage of the Candidates who Scored 35% Marks or Above	Average performance in each topic	Remarks
1	Computer Security and Privacy	9 (P1)	99.45		Good
2	Data Communication and Networking	4 (P1)	99.05		Good
3	C++ Programming	2 (P1)	95.24	93.81	Good
		1 (P2)	92.38		
4	Computer Basics	7 (P1)	91.43		Good
5	IT Environment	3 (P1)	90.95		Good
6	Data Structure and Algorithms	10 (P1)	83.52		Good
7	Website Development	6 (P1)	70.00	81.38	Good
		2 (P2)	92.75		
8	Visual Programming	5 (P1)	66.67	68.63	Good
		3 (P2)	70.59		
9	Data Representation	1 (P1)	66.67		Good
10	Systems Development	8 (P1)	30.91		Weak

