



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



**STUDENTS' ITEM RESPONSE ANALYSIS REPORT
ON THE FORM TWO NATIONAL ASSESSMENT
(FTNA) 2022**

INFORMATION AND COMPUTER STUDIES



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036 INFORMATION AND COMPUTER STUDIES

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LIST OF ABBREVIATIONS

ALU	–	Arithmetic and Logic Unit
CPU	–	Central Processing Unit
CU	–	Control Unit
FTNA	–	Form Two National Assessment
LAN	–	Local Area Network
MAN	–	Metropolitan Area Network
NIC	–	Network Interface Card
PAN	–	Personal Area Network
RAM	–	Random Access Memory
ROM	–	Read Only Memory
SIRA	–	Students' Item Response Analysis
WAN	–	Wide Area Network

FOREWORD

This report presents Students' Item Response Analysis (SIRA) on Form Two Information and Computer Studies National Assessment (FTNA) which was conducted in November 2022. The report aims to provide feedback to all educational stakeholders on the factors that contributed to the students' performance in Information and Computer Studies.

The Form Two National Assessment (FTNA) is a formative evaluation which intends to monitor students' learning and provide feedback that teachers, students and other educational stakeholders can use to improve teaching and learning respectively. This analysis shows justification for the students' performance in the Information and Computer Studies subject. The students who performed well had sufficient knowledge of the subject content and correctly identified the requirements of the questions. However, the students who scored low marks had insufficient knowledge of the tested concepts and lack of proficiency in English language.

This report will help students to identify strengths and weaknesses for them to improve learning before sitting for the Certificate of Secondary Education Examination (CSEE). The report will also help teachers to identify the challenging areas and take appropriate measures during teaching.

The National Examinations Council of Tanzania (NECTA) expects that the feedback provided in this report will highlight the challenges which education stakeholders should take proper measures so as to improve teaching and learning of the Information and Computer Studies subject. Consequently, students will acquire knowledge, skills and competences indicated in the syllabus for better performance in future assessments and examinations.

The Council appreciates the contribution of all those who prepared this report.



Dr. Said Ally Mohammed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

The Form Two National Assessment paper in the Information and Computer Studies subject for the year 2022 was set according to the 2021 Information and Computer Studies assessment format which is based on the 2005 Syllabus for Ordinary Secondary Education.

The assessment paper had three sections; A, B and C. Section A consisted of two objective questions. Question 1 consisted of 10 multiple-choice items and question 2 consisted of 5 homogeneous matching items. This section carried a total of 15 marks. Section B consisted of seven short answer questions which carried a total of 70 marks, and section C consisted of an essay question which weighed 15 marks. All questions in all sections were compulsory.

The students' performance in each question/topic has been categorized using the ranges of 0 to 29 per cent (weak performance), 30 to 64 per cent (average performance) and 65 to 100 per cent (good performance). The students' performances are presented using different colours in which the red colour stands for weak performance, the yellow colour stands for average performance and the green colour stands for good performance.

A total of 12,863 students sat for this paper in November, 2022, of which 7,682 (59.7%) passed and 5,181 (40.3%) failed. In the 2021 performance, 11,901 students sat for the assessment, of which 7,288 (61.2%) passed and 4,613 (38.8%) failed. In 2022 the performance decreased by 1.51 per cent when compared to the 2021. Figure 1 shows the comparison between students' performance in 2021 and 2022.

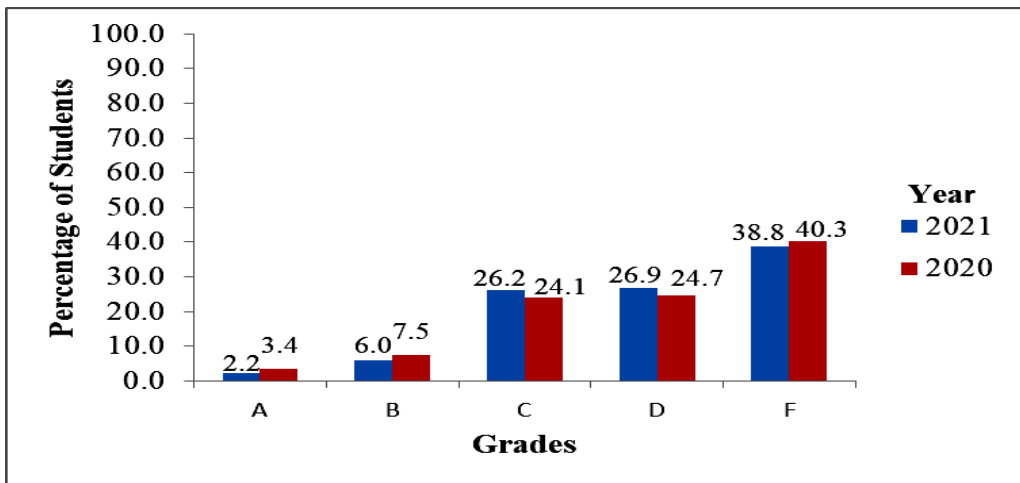


Figure 1: A comparison between students' grades in 2021 and 2022.

2.0 ANALYSIS OF STUDENTS' PERFORMANCE IN EACH QUESTION

2.1 Question 1: Multiple Choice Items

The question had ten (10) multiple-choice items that were drawn from seven different topics. The topics were *Information, The Computer, Computer Handling, Word Processing, Spreadsheet, Computer Networks and Communications* and *Computer Evolution*. The students were required to select the correct answer from the available four options (A – D).

The question was attempted by 12,863 (100%) students, out of whom 2,097 (16.3%) scored from 0 to 2 marks, 8,522 (66.3%) scored from 3 to 6 marks and 2,244 (17.4%) scored from 7 to 10 marks out of 10 marks. The overall performance was good since 83.7 per cent of students scored above 3 marks on this question. Figure 2 shows the summary of students' performance in this question.

This item tested students' knowledge of classifying printers according to their quality and working speed. The correct answer was D, *Laser printer*. However, some of the students selected alternative B, *Inkjet printer* while others chose C, *Thermal printer* which did not fulfil the characteristics of speed and high quality compared to Laser printer. On the other hand, few students selected alternative A, *Dot matrix printer* due to lack of knowledge about the types of printer because Dot matrix printer is an example of impact printers.

Item (iii): *How many main components made up a typical computer system?*

- A 2 B 4
C 3 D 5

This item tested the students' knowledge of computer system. The correct answer was C, 3. The analysis showed that most of the students selected alternative A, 2. These students mixed up the components of computer which are hardware and software and computer system which involves hardware, software and humanware. Others, who chose alternative B, 4 and D, 5 were also wrong because they represent categories of computer hardware. This showed that the students had insufficient knowledge of the computer system.

Item (iv): *Most of the teachers in a certain school that uses computers in performing their daily activities reported the problem of disappearing some files. Which is the best way of preventing data from loss and damage?*

- A *Backing up the file.* B *Using password.*
C *Updating anti-virus.* D *Using antiglare screen.*

This item tested students' knowledge of preventing loss of data and damage. The correct answer was A, *Backing up the file*. The analysis showed that some students chose alternative B, *Using password*. The students who selected this alternative confused security issues which can be prevented by using password to control data loss with damage which can be countered by using backing up files. Alternative C, *Updating anti-virus* prevents loss of data caused by the viruses. Lastly, alternative D, *Using antiglare screen* was also not correct because it

protects the computer user against the brightness of computer which is a health related issue.

Item (v): *Why do microcomputers need application software?*

- A *Executes routine services such as file handling.*
- B *Executes specific task demanded by the user.*
- C *Executes a variety of fundamental operations.*
- D *Executes a variety of system utility functions.*

This item tested students' knowledge about the function of application software in personal computers. The correct answer was B, *Executes specific task demanded by the user*. The students who selected alternatives A, *Executes routine services such as file handling*, C, *Executes a variety of fundamental operations* and D, *Executes a variety of system utility functions* could not differentiate functions of Operating System from those of application software. Therefore their answers were not correct.

Item (vi): *To make a student competent in adding number using Microsoft excel, a teacher distributed numbers as shown in Figure 1 and asked them to compute the results. Which function can be used to find the total numbers given in row 2?*

	A	B	C
1	2	5	1
2	9	3	8
3	7	4	6

Figure 1

- A =SUM(A2:A3)
- B =SUM(A2:C2)
- C =SUM(B2:C2)
- D =SUM(C2:C3)

This item tested students' knowledge of using inbuilt formula in adding numbers entered in a worksheet. The correct answer was B, =SUM(A2:C2). The analysis showed that, some of the students selected alternative A, =SUM(A2:A3) which was incorrect. These students failed

to recognize how the function works in rows and Columns, hence, they opted for a formula which finds a total of numbers entered in the first column. Others who chose alternative C, $=SUM(B2:C2)$ failed to understand that this function will skip value placed in cell A2 which is also allocated in row 2. Moreover, students who opted for the alternative D, $=SUM(C2:C3)$ were wrong because the function adds only numbers entered in column C which also include rows 1 and 3. The students had insufficient knowledge of manipulating data entered in worksheet using spreadsheets.

Item (vii): *In a school, students were advised to purchase laptop instead of desktop computers for their academic uses. Why was it advised to buy laptop computers?*

- A *They are very cheap to purchase.*
- B *It is easier to use laptop keyboard.*
- C *They can be used everywhere.*
- D *They cannot be easily damaged.*

This item tested students' knowledge about the advantages of using laptop computers in academic uses. The correct answer was C, *They can be used everywhere*. Other alternatives were wrong. For example, alternative A, *They are very cheap to purchase* was wrong because in reality, laptop computers are expensive to purchase compared to desktop computers. Others selected alternative B, *It is easier to use laptop keyboard* and D, *They cannot be easily damaged*. Both of these alternatives were wrong because a laptop keyboard is similar to a desktop keyboard, and both laptop and desktop computers can easily be damaged if they are not handled well.

Item (viii): *Study the Screenshot provided in Figure 2 and then answer the question that follow:*

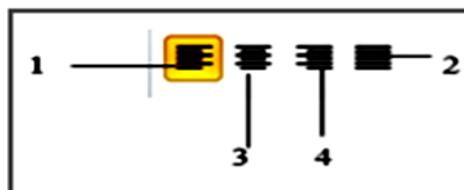


Figure 2

Which alignments of text align the text to the right margins?

- | | | | |
|----------|----------|----------|----------|
| <i>A</i> | <i>2</i> | <i>B</i> | <i>1</i> |
| <i>C</i> | <i>4</i> | <i>D</i> | <i>3</i> |

This item tested students' knowledge of formatting text typed in Microsoft word. The correct option was C, 4. Students who chose other options were wrong because the alignment labelled with number 1 aligns the text to the left margin and the alignment labelled with number 3 aligns the text to the centre. Moreover, the alignment labelled with number 2 (Justify) aligns the texts evenly to both left and right margins.

Item (ix): Modern Education Institute has a LAN in its Primary School and another set in its Secondary School which are located in the same district. Which device is needed to connect two LANs to enable data sharing and resources between them?

- | | |
|-----------------|-----------------|
| <i>A Modem</i> | <i>B Hub</i> |
| <i>C Switch</i> | <i>D Router</i> |

This item tested students' knowledge of connecting LANs to enable data and resources sharing. The correct answer was D, *Router*. The analysis reveals that some students selected alternative A, *Modem*. These students failed to differentiate the device which change data formats from digital to analogy and vice versa from the device which allows data sharing. Other students chose options B, *Hub* and C, *Switch*. These students failed to differentiate between devices (Hub and Switch) which allow data sharing within the same LAN and the devices (Router) which allow data sharing across different LANs.

Item (x): While preparing a Form Two terminal results in a worksheet, a teacher noticed an error message \$VALUE! What does this error signify?

- A Used incorrect numeric values.*
- B Used incorrect argument to the formula.*
- C Used incorrect cell reference to the formula.*
- D Used a blank cell or dividing by zero.*

This item tested students' knowledge of identifying errors messages occurring in Microsoft excel. The correct answer was B, *Use of*

incorrect argument to the formula. The analysis showed that majority of the students scored zero in this item by selecting option A, *Use of incorrect numeric values* which was wrong because this error displays the error message #NUM and not \$VALUE!. These students were attracted by the word “values” which appeared in the distractor. Option C, *Use of incorrect cell reference* was also not correct because such error displays the message #N/A. This implied that the students had insufficient knowledge on the use of predefined formula and their corresponding error messages.

2.2 Question 2: Computer Software

This question tested students' understanding of the roles played by various operating systems. In this question, the students were required to match the functions of different types of operating systems in **List A** with their corresponding types of operating systems in **List B** by writing the letter of the correct answer below the item number in the table provided. The question was as follows:

The items were as follows:

List A	List B
(i) A system that performs a task by reading the command after user pressing the enter key.	A Single task operating system B Multi-task operating system
(ii) A system that enables more than one user to access a centralized computer.	C Single user operating system D Multi-user operating system
(iii) A system that runs only one user program at a time.	E Command line operating system
(iv) A system that uses priority scheduling to allocate each task a portion of the time in a CPU.	F Utility operating system G Menu driven operating system
(v) A system that cannot allow a user to run both word processor and spreadsheet.	H Mixed user operating system

A total of 12,863 (100%) students attempted this question. Out of whom, 3,291 (25.6 %) scored from 0 to 1 mark, 5,370 (41.7 %) scored from 2 to 3 marks and 4,202 (32.7%) scored from 4 to 5 marks out of 5 marks allocated. These scores indicate that the students' performance was good as 74.4 per cent scored above 1 mark. Figure 3 summarizes the students' performance in this question.

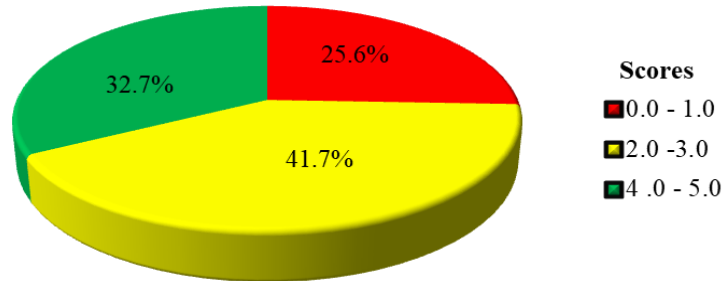


Figure 3: *The Students' Performance in Question 2.*

The following is the analysis of students' responses to each item of this question:

Item (i) tested ability of the students to identify an operating system that *performs a task by reading the command after a user pressing the enter key*. The correct answer was E, *Command line operating system*. Most of the students responded correctly to this item. This signified that the students had sufficient knowledge of such operating system. A few students selected option F, *Utility operating system*. These students could not differentiate utility programs from operating system. Others selected alternative A, *Single task operating system*. These students associated the term “a task” used in the stem with “single task” used in alternative A.

Item (ii) assessed the students' ability to recognize an *operating system that allows several users to access a centralized computer*. The correct response was B, *Multi-user operating system*. The analysis revealed that majority of the students answered this item correctly. However, some of the students chose option B, *Multi-task operating system*. Such students failed to differentiate between the function of multi-task and multi-user operating system. Other students selected option H, *Mixed user*

operating system, which does not exist. This signified that the students had limited understanding of types of operating system which led them to guess the answer.

Item (iii) tested the ability of the students to identify a system that *runs only one user program at a time*. The correct response was C, *Single user operating system*. Most of the students correctly identified the required operating system. However, some of the students chose option A, *Single task operating system*. These students misinterpreted the term “user program” in the stem as a task done by the user.

Moreover, item (iv) tested ability of the students to identify a system that *uses priority scheduling to allocate each task a portion of the time in a CPU*. The correct response was B, *Multi-task operating system*. The analysis done in the students responses showed that this item was performed poorly. Majority of the students selected other options which led them to score zero. Some of them chose option A, *Single task operating system*. These students were influenced by the words “each task” used in the stem which led to wrong interpretation of the whole statement. Others chose option G, *Menu driven operation*. This signified that the students had wrong interpretation of the stem.

Item (v) assessed the ability of the students to recognize a system *that prevents a user from using both a word processor and a spreadsheet program at once*. The correct answer was A, *Single task operating*. Most of the students failed this item by choosing H, *Mixed user operating system*. Such students related the term “mixed” with the two programs stated in the stem. The students also failed to recognize that Microsoft word and Microsoft excel are two different applications and therefore, cannot work concurrently in a single task operating system. It was noted that some students selected option C, *Single user operating system*. This implied that the students confused the functions of single task with single user operating system.

2.3 Question 3: The Computer

This question consisted of two parts (a) and (b). The students were required to:

(a) Explain three uses of computers in a school.

(b) Give two weaknesses of computers that school can experience.

The data analysis showed that the question was answered by 12,863 (100%) students and among them, 5,815 (45.2%) students scored from 3 to 6 marks and 3,897 (30.3%) students scored from 6.5 to 10 out of 10 marks allocated. However, 3,151 (24.5%) students scored below 3 marks. The general performance of students in this question was good because 75.5 per cent of the students scored above 6 marks. Figure 4 presents the students' performance in this question.

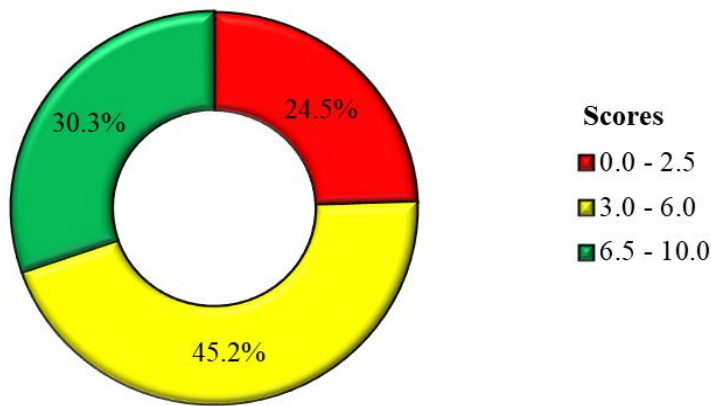


Figure 4: *The Students' Performance in Question 3.*

Figure 4 shows that majority of the students (45.2%) scored average marks. In part (a), some of these students explained correctly two uses of computers in school. Common uses provided by these students included *typing examinations* and *keeping documents*. It was noted that some students listed uses of computer in school without giving explanations. Other students gave correct uses of computers with unclear explanations. For example, one student wrote; *It used to keep information: - Computer at school has large memory for storage of data and information and it perform its work logically step by step*. The student explained about storage capacity of the computer instead of specifying school information that can be stored in the computer.

Moreover, other students wrote correct uses of the computer with irrelevant explanations. For example, one student wrote *store data: computer in our home is used to storing data in the computer from one*

computer to another. This student explained storage of data at home instead of school as required in the question. In part (b), a few students gave the weakness of computers in schools such as lack of electricity. However, some students confused the weaknesses of computer and disadvantages of using computer. For example, some students wrote *virus problem* and *causes moral decay*. This implied that the students did not understand the requirements of the question.

On the other hand, 30.3 per cent of the students scored above 6 marks. Some of these students explained correctly three uses of computers in a school in part (a) and gave the correct weakness of computer in school in part (b). However, some students explained correctly only one weakness of computer. Moreover, other students gave two weaknesses of computer but failed to explain them clearly in relation to school activities. For example, one student wrote *virus attacked: - the computer can attacked by different viruses which make computer laziness*. This indicated that the students had an idea but could not explain it in English. Extract 3.1 shows the correct response from one of the students.

3. Most of schools nowadays prefer the use of computers in performing their daily activities.

(a) Explain three uses of computers in a school.

(i) ..Used to prepare school examinations. In a school, computers are used to type the exam and are finally printed on paper using a printer.

(ii) ..Used to keep record of students' marks and attendance. Students' important informations i.e. marks, attendance, etc. are recorded by using computers.

(iii) ..Used for online learning. Students can receive more knowledge on a certain subject through different websites on the internet. Example: www.msombara.com

(b) What are the two weaknesses of computers can schools experience?

(i) They cannot be used without electricity.

(ii) Difficult for computer illiterates.

Extract 3.1: A sample of the student's responses to question 3

In extract 3.1, the student gave correct uses of computers at school in part (a). In part (b), the students wrote correctly two weaknesses of computers at school.

Further analysis showed that some students (24.5%) who scored low marks explained correctly only one use of computers in part (a). Other students wrote one or two uses of computers but failed to elaborate them. Moreover, some of the students wrote advantages of computer instead of uses of computer at school. For example, one student wrote *it is accurate* while another student wrote *it saves time*. The students confused the uses of computers with advantages of the computer. Others explained the uses of the computer in other places, not at school. For example, one student explained that *Computer is used at hospital by applying different ways of making medicine and also counting patients who are sick it helps doctors to know sum of them*. This implied that the students did not understand the requirements of the

question. In part (b), the students failed to give correct weakness of computers at schools. Some students wrote irrelevant points while others did not write anything. Extract 3.2 shows a sample of incorrect responses from one of the students who attempted this question.

3. Most of schools nowadays prefer the use of computers in performing their daily activities.

(a) Explain three uses of computers in a school.

(i) Computer it used in communication. Is the point which support the uses of computer this point is true because when the computer is used also in communication

(ii) Computer used in transport. this is the point because computer used in many area because is the one of the tools which used in transport.

(iii) Computer used in banking. this is the point which support about the uses of computer and also computer used in banking.

(b) What are the two weaknesses of computers can schools experience?

(i) low of electrical. It can cause the weakness of computers

(ii) special room. it can cause this or those computer to be weaknesses

Extract 3.2: A sample of the student's responses to question 3

Extract 3.2 shows the response from one of the students who wrote the uses of computer connected in the network instead of uses of computer in school in part (a). In part (b), the student wrote the factors to be considered in order to use computers instead of weakness of computer.

2.4 Question 4: Internet

This question consisted of four parts (a), (b), (c) and (d). The question was as follows:

Due to the outbreak of the COVID-19 pandemic in 2020, most companies in the world allowed their employees to work from home and communicate with their offices through internet.

- (a) What were the two hardware and two software used by the employees to access the internet?
- (b) Identify two ways through which a report could be sent to the office by using the internet.
- (c) What are the two benefits the companies might experience by using this new form of working?
- (d) What are the two disadvantages of working from home?

The analysis of students' performance showed that, out of 12,863 (100%) students who attempted this question, 6,203 (48.2%) scored from 0 to 2.5 marks, out of whom 2,761 (21.5%) scored 0 out of the 10 marks allocated to this question. Students who scored from 3 to 6 marks were 5,049 (39.3%), whereas 1,611 (12.5%) scored from 6.5 to 10 marks, as shown in Figure 5. The students' performance in this question was average because 51.8 per cent of the students scored above 2.5 marks.

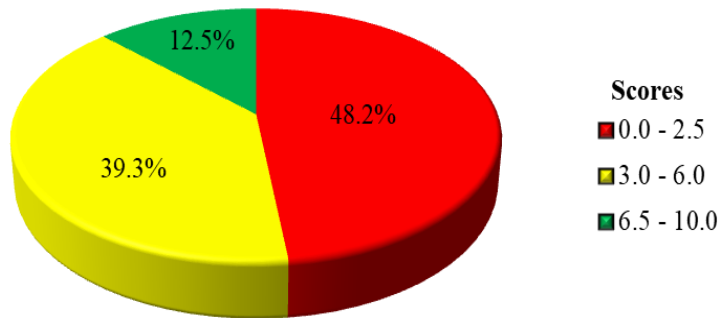


Figure 5: *The Students' Performance in Question 4.*

Figure 5 shows that majority of the students (48.2%) scored low marks, including 21.5 per cent who scored zero. In part (a), majority of these students faced difficulties in identifying the hardware and software used by the employees to access the internet. Some of the students mentioned *hardcopy documents such as books* as the hardware used to access internet. Others wrote application software such as *Ms-excel* as the software used to access internet. These students could not differentiate hardware from hardcopy and they would not identify the function of application software such as Ms-excel. In part (b), some students wrote ways of disseminating information instead of ways through which a report could be sent by using internet. Others skipped this part.

Furthermore, it was observed that some students wrote domain name such as *yahoo.com* and *google.com* contrary to the requirement of the question. In part (c), they wrote benefits of using computer instead of advantages of working from home. For example, some candidates wrote *provides employment* and *it is reliable*. Conversely, some students gave the correct benefit which the company will experience by using new form of working. The common benefit provided by students was faster communication. In part (d), some of the students wrote that *it is expensive* as the disadvantage of working from home, which was wrong because working from home minimizes costs such as transport. These students were supposed to understand that working from home can be unproductive due to the interference of family affairs. Extract 4.1 shows a sample of incorrect responses from one of the students.

4. Due to the outbreak of the COVID-19 pandemic in 2020, most companies in the world allowed their employees to work from home and communicate with their offices through internet.

(a) What were the two hardware and two software used by the employees to access internet?

Hardware:

(i) ... monitor

(ii) ... keyboard

Software:

(i) ... System Software

(ii) ... Application System

(b) Identify two ways through which a report could be sent to the office by using the internet.

(i) Used by router from home:

.....

(ii) Used by wireless local area network in communication:

.....

(c) What are the two benefits the companies might experience by using this new form of working?

(i) They can use to create document in every where.

.....

(ii) They can use router instead of wireless cable.

.....

Extract 4.1: A sample of the student's responses to question 4

The response of a student provided in Extract 4.1 shows that the student wrote parts of computer and types of computer software in part (a). In part (b), the student wrote types of communication instead of ways used to send report through the internet. The benefits provided in part (c) were wrong.

On the other hand, 39.3 per cent of the students scored average marks. Some of these students managed to write either one hardware or software used by employees to access the internet in part (a). Some of the students wrote parts of the computer such as *keyboard* and *mouse*. Other students wrote network devices such as *Network Interface Card*, *modem* and *hub* as the software used by employees to access the internet. However, some students had the idea of software required to send report but could not specify the exact software, consequently they confused search engine with web browser. For example, some students identified *Google chrome* and *Google* as software required by employees to access the internet. In part (b), most of the students correctly identified the ways used to send report through the internet. Some of these students mentioned *WhatsApp* and *email* as possible ways of sending report through the internet. Likewise, in part (c), the students wrote correctly two benefits the company might get when employees work from home. They also managed to give only one disadvantage of working from home in part (d).

Furthermore, 12.5 per cent of the students scored high marks in this question. A few students identified correctly the hardware and software required to access the internet in part (a). For example, some of the students wrote *Modem*, *Personal computer*, *Wi-Fi Router* and *PDA* as hardware required, and software such as *Mozilla Firefox*, *Internet explorer*, *Google chrome*. However, some students faced difficulties in identifying the software required to access the internet. They also correctly identified ways through which a report could be sent to the office in part (b). The ways identified by some students included *E-mail*, *Video conferencing* and *WhatsApp*. Lastly, some students gave the correct disadvantages of working from home required in part (d). For example, some students wrote *Working from home can be unproductive due to the interfering of family affairs* and *lack of team work*.

2.5 Question 5: The Computer

This question consisted of three parts (a), (b) and (c). The students were required to read the given scenario and answer the questions that followed. The question was as follows:

Most electronic devices such as computers and mobile phones contain the most important device which is regarded as a brain of computer.

- (a) Identify this device and give one reason for considering it as the brain of a computer.
- (b) In which part of the system unit is the device identified in part (a) allocated?
- (c) Explain three functional elements of the device identified in part (a)

The analysis of students' performance showed that out of 12,863 (100%) students who attempted this question, 6,761 (52.6%) scored from 0 to 2.5 marks, out of which 3,996 (31.1%) scored 0 out of 10 marks allocated. Moreover, 3,797 (29.5%) students scored from 3 to 6 marks whereas 2,305 (17.9%) scored from 6.5 to 10 marks, as shown in Figure 6. Generally, this question had an average performance because 47.4 per cent of the students scored above 2.5 marks.

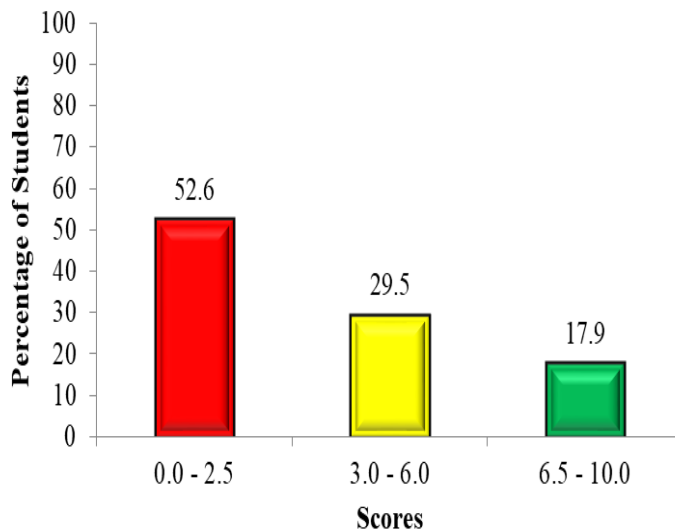


Figure 6: *The Students' Performance in Question 6.*

The analysis of the students' responses showed that majority (52.6%) of the students who scored low marks faced difficulties in identifying the

device which is regarded as the brain of computer in part (a), consequently they failed to identify its location asked in part (b). These students also could not explain the functional elements of the device in part (c). It was noted that some of the students wrote computer hardware parts such as *ROM*, *RAM* and *hard disk* instead of CPU. Others wrote elements of CPU such as *ALU* and *CU*. However, some students identified CPU as the device which is regarded as the brain of a computer in part (a) but failed to recognize its location in part (b), as a result they gave wrong answers such as *system unit* and *monitor*. In part (c), most of the students managed to list *ALU* and *CU* as the elements of the CPU but failed to explain their functions.

Likewise, some students explained functions of other hardware components such as *keyboard*, *mouse* and *monitor* instead of functional elements of the CPU. Others wrote the functions of the computer. These students confused the term “functional” with “function”. This implied that they lacked knowledge of the uses of CPU in computers and mobile phones. Extract 5.1 shows a sample of incorrect response from one of the students.

5. Most electronic devices such as computers and mobile phones contain the most important device which is regarded as the brain of computer.

(a) Identify this device and give one reason for considering it as the brain of a computer?

Central processing unit (CPU)
In order to simplify the computer system.

(b) In which part of the system unit does the device identified in part (a) allocated?

In the computer back up.

(c) Explain three functional elements of the device identified in part (a).

- (i) To select the system of all microsoft processor - this it help to selected this system through the central processing unit.
- (ii) To allow and identify all mistake or error in the computer - the central processing unit it have the able to identify mistake in the computer.
- (iii) To ensure the system of computer is not stop - this the central processing unit enable to ensure this cause or problem in the computer.

Extract 5.1: A sample of the student's responses to question 5

In extract 5.1, the student managed to identify the device but failed to give the correct reason in part (a). The students also wrote irrelevant answers in part (b) and (c).

On the other hand, most of the students (29.5%) who scored average marks identified CPU as the device which is regarded as the brain of a computer in part (a) but could not give its appropriate location in part (b). Some students wrote *operating system* or *computer system* as the places where CPU is located instead of motherboard or circuit board. In part (c), the students explained correctly only one or two functional elements of the CPU. Some students listed correctly three elements of CPU but they gave wrong explanations. Others explained the importance CPU instead of functions of the elements within the CPU.

Likewise, the majority of students (17.9%) who scored high marks responded correctly to parts (a), (b), and (c). Some of these students were able to identify the device (CPU) and gave the correct reason in part (a). They also managed to explain three functional elements of the

CPU. However, in part (b), some of the students failed to identify the part within the system unit where CPU is located. For example, one student wrote *Inside of the system unit*. This answer was too general and therefore led them to lose some marks. Extract 5.2 shows the sample of a correct response from one of the students.

5. Most electronic devices such as computers and mobile phones contain the most important device which is regarded as the brain of computer.

(a) Identify this device and give one reason for considering it as the brain of a computer?

Central processing unit (CPU) because it control the functioning of other parts of the computer. also execute and run programs.

(b) In which part of the system unit does the device identified in part (a) allocated?

on the motherboard

(c) Explain three functional elements of the device identified in part (a).

(i) Arithmetic logic unit: here, Arithmetical deals with the mathematical operation which logic - arrange works logically to be runned.

(ii) Control unit: control and execute running program to run in the computer.

(iii) Main memory: store or for storage of data found in the computer.

Extract 5.2: A sample of the student's responses to question 5

In extract 5.2, the student managed to answer correctly all parts of this question.

2.6 Question 6: Spreadsheet

The question had four parts: (a), (b), (c) and (d). In this question the students were required to study the screenshot of a worksheet given in Figure 3 and answer the questions that followed:

	A	B	C	D	E	F
						EXIT
1				ME		
2						
3		85	86	M(B3:C3)		
4						
5				ABS		

Figure 3

- Identify the features labelled with letter A and B in Figure 3.
- Explain three types of data entries in a given worksheet. Give one example for each.
- What are the procedures required for creating borders in cell A2 to A5?
- Which steps would you follow to align the word EXIT vertically?

The question was attempted by 12,863 (100%) students out of whom 9,068 (70.5%) students scored below 3 marks. This implies that the students' performance in this question was weak. 3,795 (29.5%) students scored above 2.5 marks. Figure 7 shows a summary of the students' performance in question 6.

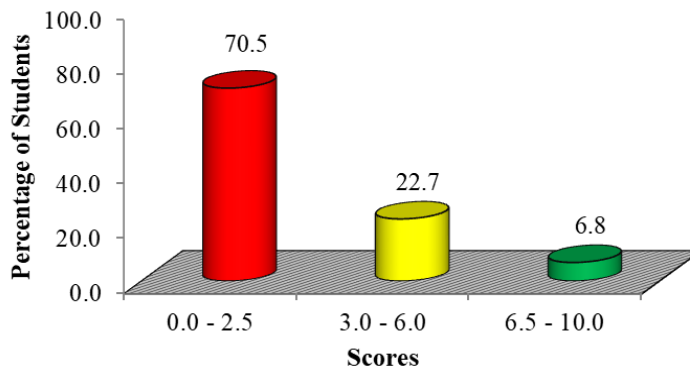


Figure 7: The Students' Performance in Question 6.

The analysis showed that majority of the students (70.5%) who scored low marks in part (a) identified features labelled with letter A as "SUM" and letter B as "=SUM(B3:C3)" which were the texts which appeared in the screenshot provided. These students could not understand that the text 'SUM' is the function name, so it must appear in the 'Name Box' and "=SUM(B3:C3)" is the pre-defined formula

which must be allocated in the “Formula Bar”. Some students wrote terms of spreadsheet such as *active cell* and *cell address* to the letter A. Others wrote other features such as title.

Likewise, in part (b), the students wrote data types which are not related to spreadsheet. For example, some students wrote *statistical data*, *geographical data* and *whole data*. It was observed that some students failed to determine the data type, instead they wrote the data entered in the worksheet as data types. For example, some students wrote, 85, 86 and $M(B3:C3)$ as data types instead of labels, Values/Numbers and functions. This indicates that the students lacked knowledge of data types used in spreadsheet. However, some students gave correctly at least one data type but failed to explain by giving the appropriate examples. In parts (c) and (d), some students managed to identify the first step which was to *highlight the intended cells* but failed to complete other steps. This indicates that these students lacked basic skills on worksheet. Extract 6.1 shows a sample of incorrect responses provided by one of the students.

6. Study carefully the screenshot of worksheet program given in Figure 3 and then answer the questions that follow.

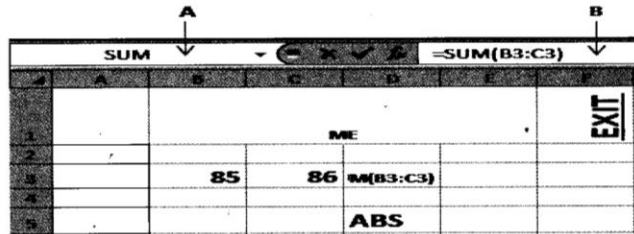


Figure 3

- (a) Identify the features labeled with letter A and B in Figure 3.
- Letter A WORK WORK BOOK
 - Letter B WORKSHEET
- (b) Explain three types of data entries entered in a given worksheet? Give one example for each.
- Name of Data - For example THE RESULTS OF FORM TWO BOB2 when the entered the entries in a worksheet.
 - Marks of every students write in the row - For example ASHA, MISO MAPYA, MISO GRANUWA and others to know and to identify the marks ~~ASHA~~ score marks.
 - enter the marks who score, for example ASHA 90 MISO MAPYA 70 and other this process help the users to know and identify the makers of results.
- (c) What are the procedures required for creating borders in cell A2 to A5?
- Determine the cell A2 to A5
 - Highlight ~~to~~ from A2 to A5
 - click A2 to A5 and then the results found.
- (d) Which steps would you follow to align the word EXIT vertically?
- Click on the (x)
 - rewrite
 - highlight on horizontally
 - click on the ~~E~~ EXIT

Extract 6.1: A sample of the student's responses to question 6

Extract 6.1 shows the response from one of the students who wrote components of spreadsheet in part (a). In part (b), the student wrote examples of data which can be entered in the worksheet instead of data types. The student also had the idea of creating borders in part (c) but could not provide appropriate steps. The student also provided wrong steps in part (d).

Further analysis showed that 22.7 per cent of the students who scored average marks failed to identify the features labelled with letter A and B in part (a). Some of the students wrote *function name* as the feature labelled with letter A and *function* as the feature labelled with letter B. This signified that the students directly translated the displayed

features. In part (b), the students gave correct data types with their examples but failed to explain them. Further analysis reveals that some students explained correctly only one data type. The *value/number* data type was explained by many of students. It was noted that other students had an idea of types of data entries entered in a worksheet but could not understand that “function” and “formula” are not different data types. In part (c), the students managed to write correct procedures required to create borders from cell A2 to A5. Moreover, in part (d), most of the students managed to give correctly all steps except the first step (Highlight the Exit text) which was skipped by some students. Additionally, some students wrote the steps of underlining the word EXIT instead of aligning it vertically. This indicates that the students did not understand the requirement of the question.

Furthermore, 0.2 per cent out of 6.8 per cent of the students who scored high marks answered correctly all parts. However, some of the students failed to score full marks because they mistook the feature name box to active cell in part (a). Other students wrote steps to align “EXIT” text right instead of aligning vertically in part (d). Extract 6.2 presents a sample of the correct responses provided by one of the students.

6. Study carefully the screenshot of worksheet program given in Figure 3 and then answer the questions that follow.

Figure 3

(a) Identify the features labeled with letter A and B in Figure 3.

(i) Letter A *Name box*

(ii) Letter B *Formula bar*

(b) Explain three types of data entries entered in a given worksheet? Give one example for each.

(i) *Values; these refers to as numerical values in a cell. for example we can see in our given worksheet in cell B3 the numerical is 85 also in C3 86*

(ii) *label; these refers to as texts or letters, alphabets entered into the cell. example from our given worksheet we can see alphabets in cell D5 which is ABS and F1 EXIT*

(iii) *function; these refers to as a collection of inbuilt formulas for example as we observe in our given worksheet we can see it in cell D3 which is =SUM(B3:C3)*

- (c) What are the procedures required for creating borders in cell A2 to A5?
- (i) ... highlight the place you need to create border. (A2 to A5)
 - (ii) Go to the tool bar: click, then go to the place with the border, then
 - (iii) click, then the border will appear.
- (d) Which steps would you follow to align the word **EXIT** vertically?
- (i) First of all highlight the word you want to align "Exit"
 - (ii) After to highlight move the pointer to the tool bar (alignment section)

Extract 6.2: A sample of the student's responses to question 6

Extract 6.2 shows the response of a student who answered correctly parts (a), (b), (c) and (d) in this question.

2.7 Question 7: Word Processing

This question consisted of two parts (a) and (b). The question was as follows:

You were given an assignment by your teacher to construct a friendly letter. In attempting the task, students proposed to use electronic word processor instead of paper to accomplish the task.

- (a) Why students suggest using electronic word processor instead of paper? Give two reasons.
- (b) Explain three possible text alignment features found in electronic word processor.

A total of 12,863 (100%) students attempted this question, out of which 6,483 (50.4%) scored below 3 marks while 3,409 (26.5%) scored zero mark. Students who scored from 3 to 6 marks were 2,834 (22.0%) and 3,546 (27.6%) scored from 6.5 to 10 marks. The general performance in this question was average because 49.6 per cent of the students scored above 3.0 marks. Figure 8 presents the students' performance in this question.

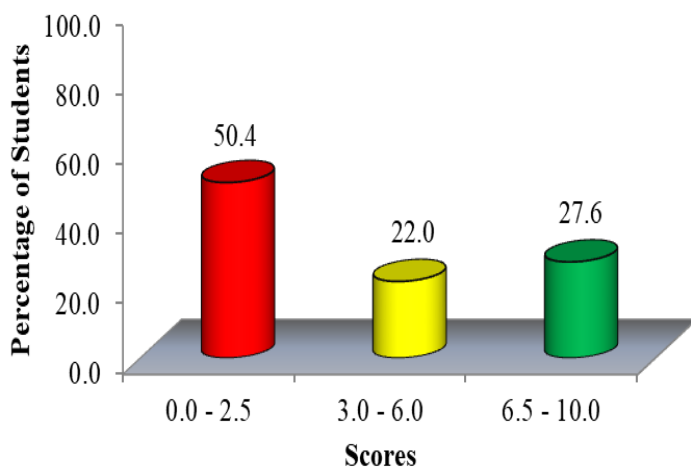


Figure 8: *The Students' Performance in Question 7.*

The analysis showed that 50.4 per cent scored low marks as shown in Figure 8. Data analysis shows that 3,409 (26.5%) of the students scored zero. In part (a), majority of these students wrote advantages of computer instead of advantages of using electronic word processor in composing a letter. For example, some students wrote *electronic word processor saves time, it is reliability and it saves time because of high speed*. Some students thought that typing a letter using electronic word processor is similar to electronic mail, so they wrote the advantages of using electronic mail. However, some of the students gave one correct reason for using electronic word processor to compose a letter. The common reason given by most of the students was *construction of neatwork*. In part (b), some students gave irrelevant alignment features. For example, some students wrote *horizontal alignment, vertical alignment and diagonal alignment*. Additionally, some students wrote features of Microsoft word which are not based on text alignment such as *tool bar, menu bar and zoom slider*. Conversely, in part (b), some of the students listed correctly only one text alignment feature without giving explanations. Lastly, it was noted that some students explained the uses of electronic word processor, instead of advantages of using electronic word processor. These students lacked knowledge of using electronic word processor. Extract 7.1 shows the sample of an incorrect response provided by one of the students.

7. You were given an assignment by your teacher to construct a friendly letter. In attempting the task, students proposed to use electronic word processor instead of paper to accomplish the task.

(a) Why students suggested using electronic word processor instead of paper? Give two reasons.

- (i) It help to the using proposed assignment your student for word processor instead of paper.
- (ii) To the proposed to use electronic word processor reason to the an object to and their and suggested.

(b) Explain three possible text alignment features found in electronic word processor.

- (i) The part in which to features of word processor possible text alignment to the other operating stem system.
- (ii) The Computer to the other an object to the part instead of or accomplish the task proposed to use your construct.
- (iii) The electronic word processor instead of paper alignment features in an word processor in the part to assignment.

Extract 7.1: A sample of the student's responses to question 7

Extract 7.2 shows the response of a student who gave useless responses to all parts due to poor English proficiency.

On the other hand, 27.6 per cent of the students scored high marks. Some of these students gave the correct reasons for choosing electronic word processor in part (a). They also explained correctly the possible text alignment features found in electronic word processor in part (b). However, some students failed to write the term "justification" instead they wrote "align text left and right". Others explained correctly the alignments but they did not specify, consequently they failed to score full marks. Extract 7.2 presents a sample of the correct responses provided by one of the students.

7. You were given an assignment by your teacher to construct a friendly letter. In attempting the task, students proposed to use electronic word processor instead of paper to accomplish the task.

(a) Why students suggested using electronic word processor instead of paper? Give two reasons.

(i) A word processor prints many pages at a time while a paper printer prints one character at a time.

(ii) A word processor has quick formatting features such as Bold, Italic and underline while a paper does not have any formatting features.

(b) Explain three possible text alignment features found in electronic word processor.

(i) Right alignment:
- This is the type of text alignment whereby the text aligns/leans to the margins on the right.

(ii) Center alignment:
- This is the type of text alignment whereby the text aligns/leans in between the left and right margins.

(iii) Left alignment:
- This is the type of text alignment whereby the text aligns/leans to the margins on the left.

Extract 7.2: A sample of the student's responses to question 7

In extract 7.2, the student managed to correctly give reasons for using word processor instead of paper in part (a). In part (b), the students explained correctly three possible text alignment features.

2.8 Question 8: Computer Handling

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

A computer lab is supposed to have enough ventilation and it should be well protected from dust all the time.

(a) Briefly explain two problems which may be caused by lack of ventilation in a computer laboratory.

- (b) Briefly explain two problems which may occur if a computer laboratory is not well protected from dust.
- (c) What are the two measures that should be taken to ensure proper ventilation in the computer laboratory?

The analysis of students' performance showed that, out of 12,863 (100%) students who attempted this question, 6,992 (54.4%) scored from 0 to 2.5 marks, out of these 3,996 (31.1%) scored 0 out of 10 marks. A total of 4,323 (33.6%) students scored from 3 to 6 marks were, whereas 1,548 (12.0%) scored from 6.5 to 10 marks, as shown in Figure 9. This question had an average performance because 45.6 per cent of the students scored above 2.5 marks.

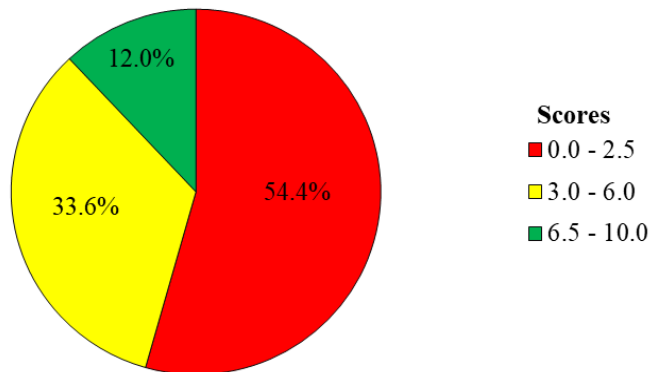


Figure 9: *The Students' Performance in Question 8.*

Figure 9 shows that majority of the students (54.4%) scored from 0 to 2.5 marks and 31.1 per cent scored zero. The analysis of their responses indicates that they performed poorly due to insufficient language skills. Some of them wrote unclear responses in all parts. For example, in part (a), one of the students wrote *user of large voltage: This one we found the person we have the many hyroc power in the one time*. Others did not understand the requirements of the question and ended up writing the problem of dust in the laboratory instead of lack of ventilation. For example, one student wrote *Computer hardware damage due to dust*. In part (b), some students explained *virus attack* as a problem caused by accumulation of dust in the computer laboratory. These students did not know that computer virus spread through network or sharing storage devices and files which are affected by virus. Additionally, some students gave only one problem with unclear explanations. In part (c),

most of the students wrote measures to overcome dust in the laboratory instead of ensuring ventilation in the laboratory. For example, one of the students wrote *closing the windows* which showed that they did not understand the requirement of the question. Extract 8.1 presents a sample of the incorrect responses from one of the students.

8. A computer lab is supposed to have enough ventilation and it should be well protected from dust all the time.

(a) Briefly explain two problems which may be caused by lack of ventilation in a computer laboratory.

(i) ...No communication of laboratory and do not eat
laboratory for

(ii) No sharing information of wash apparatus after experiment in
the laboratory

(b) Briefly explain two problems which may occur if a computer laboratory is not well protected from dust.

(i) It is high cheap

(ii) It promoting business of computer interater

(c) What are the two measures that should be taken to ensure proper ventilation in the computer laboratory?

(i) router

(ii) Hub

Extract 8.1: A sample of the student's responses to question 8

Extract 8.1 shows the response from one of the students who wrote laboratory rules in part (a) instead of problems caused by lack of ventilation. The student also wrote unclear answers in part (b) and wrote computer network devices in part (c) as measures of ensuring proper ventilation in the computer laboratory.

Most of the students (33.6%) who scored average marks faced difficulties in explaining problems which may occur if a computer laboratory is not well protected from dust in part (a). Some of the students wrote problems caused by computer virus instead of lack of ventilation. For example, some students wrote *data loss* and *duplication of files*. Other students gave irrelevant explanations due to poor English

language proficiency. For example, one of the students wrote *bad weather- this is become when there are all window closed and there are sum shout too much and theor roses shoness*. Moreover, some of the students wrote the problems caused by dust, contrary to the requirement of the question.

Likewise, in part (b), some students thought that computers can be affected by virus found in the dust. For example, one student wrote *dust contain viruses which attack the computer*. This signifies that the student did not know that dust causes computer peripherals to stop working and health problems among computer users. In part (c), some students confused measures taken to ensure ventilation with the measures to prevent dust in the computer laboratory. Some students wrote *regularly cleaning the laboratory, covering the floor with carpet, putting curtains on the windows, and not entering in the computer laboratory with shoes*.

Moreover, the analysis showed that 12 per cent of the students scored above 6 marks. Majority of these students explained correctly the problems caused by lack of ventilation in part (a). However, some of them had knowledge of health problem caused by lack of ventilation but could not specify the exact problem in their explanations. In part (b), the students managed to explain the problems caused by dust in a computer laboratory. However, others gave unclear explanations of the problems in some points. Furthermore, some of the students gave correct measures to ensure proper ventilation in the computer laboratory in part (c). Extract 8.2 shows a sample of correct responses provided by one of the students.

8. A computer lab is supposed to have enough ventilation and it should be well protected from dust all the time.

(a) Briefly explain two problems which may be caused by lack of ventilation in a computer laboratory.

(i) It can lead to over heating of the computers due to high temperature generated by the computers.

(ii) Suffocating of the computer user due to the lack of insufficient air in the room.

(b) Briefly explain two problems which may occur if a computer laboratory is not well protected from dust.

(i) The dust may enter inside the computer through its open parts and damage the computer from the inside.

(ii) The dust can lead to the users being affected by flu and other air diseases.

(c) What are the two measures that should be taken to ensure proper ventilation in the computer laboratory?

(i) There should be enough windows.

(ii) There should be fans or vents to ensure air flow.

Extract 8.2: A sample of the student's responses to question 8

Extract 8.2 shows the response of a student who answered correctly all parts of the question.

2.9 Question 9: Computer Software

This question consisted of three parts (a), (b) and (c). The students were required to read the given scenario and answer the questions that follow:

During class discussion on Information and Computer Studies subject, you noticed that your fellow students confused between the concept of a file and a folder.

- (a) How can you differentiate a file from a folder?
- (b) Which steps would you follow to create the folder on the desktop?
- (c) Which steps would be followed by students in order to save file in the created folder?

A total of 12,863 (100%) students attempted this question, out of whom 7,574 (58.9%) scored from 0 to 2.5 marks, 3,797 (29.5%) scored from 3 to 6 marks and 1,492 (11.6%) scored from 6.5 to 10 out of 10 marks allocated. The general performance in this question was average because 41.1 per cent of the students scored above 2.5 marks. Figure 10 presents the students' performance in this question.

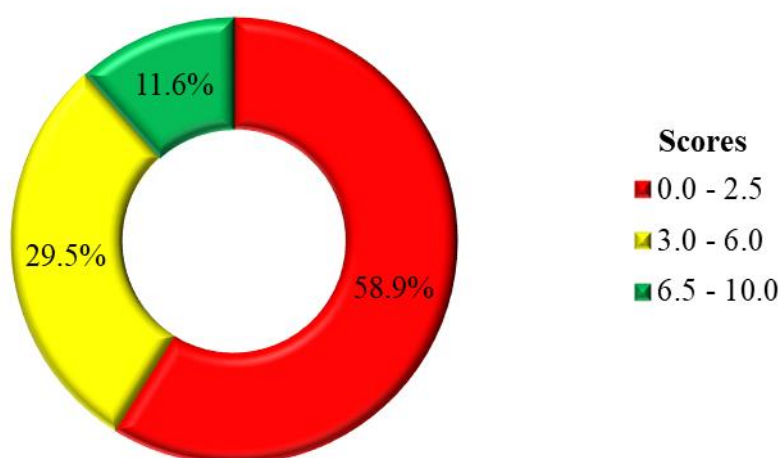


Figure 10: *The Students' Performance in Question 9.*

The analysis showed that majority of the students with low scores (58.9%) failed to differentiate a file from a folder in part (a). Some of them described a computer file as a manual file required to keep documents. For example, some students wrote *file contains piece of papers written notes*. Others described a file and a folder as programs used to store documents instead of storage locations. It was further noted that some students described a file is a general application software instead of a specific application software. Due to lack of knowledge of the concept of file and folder, the students failed to give steps of creating a folder in part (b) as well as steps for saving file in the created folder in part (c). Some of these students wrote the steps of opening files while others wrote the steps of restoring file from recycle bin. Others wrote steps of copying and pasting files instead of saving files to the folder. It was also observed that other students wrote steps

of renaming file in the desktop. However, some of the students gave correct steps of creating a folder on the desktop. This showed that the student did not understand the requirement of the question. Extract 9.1 shows the sample of an incorrect answer.

9. During class discussion on Information and Computer Studies subject, you noticed that your fellow students mixed-up between the concept of a file and a folder.

(a) How can you differentiate a file from a folder?
 File is the file of document in a given of entertain-
 ment of a person while folder is the way or method
 of spreading information or message from one p-
 erson to another.

(b) Which steps would you follow to create the folder on the desktop?
 (i) Click file tab
 (ii) Open the file
 (iii) open the document
 (iv) Click the name file.

(c) Which steps would be followed by students in order to save file in the created folder?
 (i) Click Save as
 (ii) Click Save name
 (iii) Click file tab
 (iv) Click open
 (v) Click Save file tab
 (vi) Click Open file tab

Extract 9.1: A sample of the student’s responses to question 9

Extract 9.1 shows the responses of a student who described a file as a document and a folder is a way of spreading information in part (a). The student also gave unclear steps of creating folder in part (b) and saving a file in part (c).

Apart from weak performance, 29.5 per cent of the students scored average marks. Some of these students correctly distinguished a file from a folder in part (a). However, some of them faced difficulties in differentiating these storage locations by describing them as storage devices. In part (b), some of the students wrote correctly the steps of creating a folder but they failed to arrange them in the required order. Others wrote correctly one or two steps but failed to complete other steps. In part (c), some students wrote the steps of saving a file in “my document” folder but not in the created folder. For example, one

student wrote *click file then save*. This student lacked practical skills of saving a file in the folder.

Further analysis showed that 11.6 per cent of the students scored high marks. Out of these, only 0.8 per cent correctly differentiated a file from a folder in part (a). They also gave the correct steps of creating a folder on the desktop in part (b) as well as steps of saving a file in the created folder in part (c). However, some of the students could not score full marks because they wrote unclear explanations to distinguish a file from folder in part (a). In part (b), other students wrote steps of saving a file in the created folder but failed to arrange them in appropriate order. This led them to lose some marks. Extract 9.2 presents one of the correct responses provided by a student.

9. During class discussion on Information and Computer Studies subject, you noticed that your fellow students mixed-up between the concept of a file and a folder.

(a) How can you differentiate a file from a folder?

File, This refers to the collection of data saved given a unique name for ease of access and manipulation. WHILE Folder, this is a collection of files saved in the computer.

(b) Which steps would you follow to create the folder on the desktop?

(i) Double click the screen

(ii) Then, click the option "open a folder"

(iii) Select the location, you want to place your folder

(iv) Lastly, type the name of the folder.

(c) Which steps would be followed by students in order to save file in the created folder?

(i) First, click the "File" menu.

(ii) Then click the "save as" option in the file menu.

(iii) Select the storage location in the "save file list box"

(iv) Type the name of the file saved in the "file name box"

(v) Lastly, Then, click "SAVE" command.

(vi) Lastly, check if the file is saved or not.

Extract 9.2: A sample of the student's responses to question 9

Extract 9.2 shows the response from a student who attempted correctly parts (a), (b) and (c) of this question.

2.10 Question 10: Computer Networks and Communications

This was an essay question which required the students to read the scenario and answer the question as follows:

The headmaster uses computer network to share students' reports with the subject teachers. However, he is interested to know the components that compose computer network. Describe to him the four basic elements of a computer network.

A total of 12,863 (100%) students attempted the question, of whom 10,102 (78.5%) scored from 0 to 5 marks and 2,338 (18.2%) scored from 5.5 to 10 marks. The data analysis reveals that only 423 (3.3%) students scored from 10.5 to 15 marks out of 15 marks allocated. The general performance in this question was weak because 78.5 per cent of the students scored below 5.5 marks. Figure 11 shows the performance of students in this question.

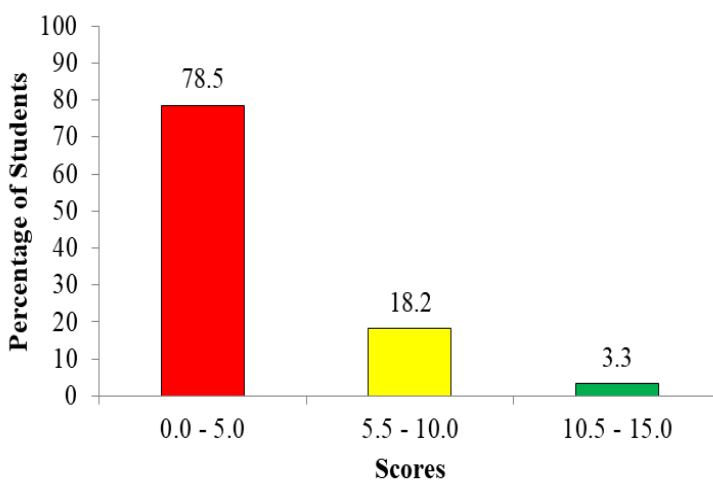


Figure 11: *The Students' Performance in Question 10.*

The analysis showed that 78.5 per cent of the students who scored low marks wrote the introduction correctly and described the types of network topologies such as *bus*, *ring*, *star*, *mesh* and *hybrid* instead of elements of a computer network. Other students had some idea of computer network as they wrote the introduction and conclusion based on it. However, some of them wrote the importance of computer network instead of describing elements of a computer network. This signifies that these students had insufficient knowledge of computer

networking. Further analysis showed that some students wrote points which are not related to computer networks. For example, one student explained parts of the computer, including *keyboard, printer, screen* and *mouse*. Moreover, others described types of computer network. For example, some students wrote *LAN, MAN* and *WAN* contrary to the requirement of the question. However, a few students were able to mention one or two communication devices, but they failed to explain them. The students' mass failure in this question signifies that they do not know the accessories used for computer network connection. Extract 10.1 shows the sample of an incorrect answer.

10. The headmaster uses computer network to share students' reports with the subject teachers. However, he is interested to know the components that composes computer network. Describe to him the basic four elements of a computer network.

A computer is an electronic device that accepts user input, processes it under the influence of a program to produce output which can be well understood by the user. A program is a set of instructions that allows a computer to perform a certain task. A computer network is a collection of computers for the purpose of resource sharing and communication. There are certain elements of computer network. The following are the elements of a computer network.

Sender; this is the element that deals with the sending of information to the receiver. This is the originator of the information and sends it to other parts for receiving.

Medium; this is the path/way through which information waves about. It links to the sender and the receiver. It can consist of wires or cables that connect the sender and receiver.

Receiver; this is the part at which the element information reaches at. The information is sent by the sender, passes through the medium and reaches the receiver.

Feedback; this is the information that is sent back from the receiver to the sender. This is the information stating that the message from the sender has been received.

In conclusion, the above explained were the basic elements of a computer network. Whereas, a computer network is a collection of computers for the purpose of communication and resource sharing.

Extract 10.1: A sample of the student's responses to question 10

Extract 10.1 shows the response of a student who described the components of communication instead of elements of computer network. The student also wrote irrelevant introduction and conclusion.

On the other hand, some of the students (18.2%) who scored average marks described examples of communication devices and data communication media. Some of them gave a correct introduction but failed to give clear descriptions of the elements of a computer network. Other students gave a correct introduction and conclusion, but they explained only communication devices as the element of computer network. Further analysis showed that some students managed to mention all the elements of computer device with their examples, but failed to describe them. Other students demonstrated poor essay writing skills as they did not write a conclusion. Moreover, some students described network switch as an electrical switch. For example, one student wrote *switch is a device which used to connect the devices by using electrical cable*. Another student wrote *switch is the one when once turned off the transmission of the data goes off since it highly depends on electricity in order to transmit data from one computer to another*. This implies that the student had insufficient knowledge of data communication devices.

Furthermore, a few students (3.3%) who scored high marks gave a correct introduction and conclusion. They also described correctly four elements of a computer network. However, some of them correctly described only two elements. Others gave correct descriptions of the points without giving examples. Further analysis showed that, some students failed to give clear introduction and conclusion as a result they lost some marks. Extract 10.2 presents one of the correct responses provided by a student.

10. The headmaster uses computer network to share students' reports with the subject teachers. However, he is interested to know the components that composes computer network. Describe to him the basic four elements of a computer network.

A network is a collection of entities that are connected together for a certain purpose. A computer network is a collection of computers connected together for the purpose of sharing resources and information. A computer network is made up of four basic elements which are the following:

Data communication media. This is a pathway in which a data signal pass. It is divided into bounded media which includes twisted pair cables and coaxial cables and unbounded media which includes microwave transmission and infrared transmission.

Communication devices. These are the devices that enable movement of data signal from one place to another. They include bridges, routers, hubs, switches, bridges, repeaters and many others.

Data signal. This is an electronic signal that contain the data that is transmitted from one communication device to another. It may be transmitted through cable (bounded) or through wireless transmission (unbounded).

Networking software. This is the software that enable efficient movement of data signal from one communication media to another. It includes NetVista and others.

Extract 10.2: A sample of the student's responses to question 10

Extract 10.2 shows the response from a student who correctly explained four elements of the computer network, and managed to give a correct introduction and conclusion.

3.0 PERFORMANCE OF STUDENTS IN EACH TOPIC

The analysis of performance shows that the students attained good performance on Multiple-Choice Items (83.7%). The items were composed from the topics of *Information, The Computer, Computer Handling, Word Processing, Spreadsheet, Computer Networks and Communications and Computer Evolution*. It was observed that the students also performed well in the questions set from the topic of *The Computer* (61.5%). This good performance is a result of the students' good practical skills and correct interpretation of the questions.

On the other hand, the students attained average performance on the topics of *Computer Software, The Internet, Word Processing, and Computer Handling*, and weak performance on the topics of *Spreadsheet and Computer Networks and Communications*. The weak performance was attributed to insufficient knowledge and skills on the concepts taught under the stated topics, lack of practical skills and poor proficiency in English. The performance of students in different topics is summarized in the *Appendix*.

4.0 CONCLUSION

The results of 2022 FTNA in the Information and Computer Studies assessment demonstrate average performance. Data indicates that 40.3 per cent of the students who sat for the assessment failed, which is an increase of 1.5 per cent of the students who failed compared to the year 2021. The reasons for this performance include insufficient knowledge and skills in the assessed concepts, and the students' failure to recall and explain the concepts. Another reason was poor English proficiency, which caused some of the students to provide unclear responses and give unsatisfactory explanations of the necessary concepts.

5.0 RECOMMENDATIONS

In order to improve the students' performance in the Information and Computer Studies subject the following measures are recommended:

- (a) Teachers should guide students on how to enter and edit data in a worksheet.
- (b) Teachers should teach students to identify accessories used for network connections.
- (c) Teachers should demonstrate how to use window based operating system.
- (d) Students should learn to describe the internet and its application.
- (e) Students should read questions carefully so as to understand clearly the requirements of the questions before attempting them.
- (f) Students should be motivated to learn English fluently since it is an added advantage in attempting the assessment.

APPENDIX: ANALYSIS OF STUDENTS PERFORMANCE PER TOPIC

S/n	Topic	Number of Questions	Per centage of Students who Scored an Average of 30% or Above	Remarks
1	Information, The Computer, Computer Handling, Word Processing, Spreadsheet, Computer Networks and Communications and Computer Evolution	1	83.7	Good
2	The Computer	2	61.5	Good
3	Computer Software	2	57.8	Average
4	Internet	1	51.8	Average
5	Word Processing	1	49.6	Average
6	Computer Handling	1	45.6	Average
7	Spreadsheet	1	29.5	Weak
8	Computer Networks and Communication	1	21.5	Weak

