THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CANDIDATES' ITEM RESPONSE ANALYSIS REPORT ON THE DIPLOMA IN SECONDARY EDUCATION EXAMINATION (DSEE) 2023

INFORMATION AND COMMUNICATION TECHNOLOGY

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FOREWORD

The National Examinations Council of Tanzania (NECTA) is pleased to issue this Candidates' Item Response Analysis Report (CIRA) on ICT for the Diploma in Secondary Education Examination (DSEE), 2023. The purpose of this report is to provide feedback to all education stakeholders and student teachers on the achievement of the implementation of diploma level ICT syllabus in the classroom through the candidates' performance. This is because, primarily, the candidates' performance is an indicator of the effectiveness of classroom teaching and learning.

The general performance of the candidates in ICT subject was good. The report displays factors which contributed to the candidates' ability to answer the examination questions correctly and score high marks. The factors include ability to identify the task of the questions, good knowledge of the subject matter, good ICT skills and correct application of the practical done on various topics. However, the candidates with low marks lacked such qualities.

It is expected that the suggestions and recommendations provided in this report will enable education stakeholders to take appropriate teaching and learning interventions so as to enable the student teachers to master the skills and knowledge hence to improve candidates' performance in the future ICT examinations administered by the National Examination Council of Tanzania.

Finally, the National Examination Council of Tanzania extends its gratitude to all examination officers and others who participated in the entire process in preparing this report.

Dr. Said A. Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report presents the performance of candidates who sat for the Diploma in Secondary Education Examination (DSEE) in May 2023 in Information and Communication Technology subject. A total of 1,933 candidates sat for the examination. Generally the candidates' performance in Information and Communication Technology subject in 2023 was good since 99.7% of the candidates passed the examination and only 0.29% failed. This performance has increased by 0.03% from 99.68% in 2022 to 99.71% in 2023.

The paper consisted of two sections, A and B with a total of fourteen (14) questions. Section A consisted of ten (10) short answer questions, each carrying 4 marks, making a total of 40 marks. Section B had four questions, each carrying 15 marks, making a total of 60 marks. The candidates were required to answer all questions in both sections.

In this report, the analysis of the candidates' performance in each question was classified into weak, average and good in both sections A and B. For Section A, the performance of the candidates is regarded as *Weak* if the scores ranged from 0 to 1.5 marks, *Average* 2 to 2.5 marks, and *Good* if the scores ranged from 3 to 4 marks. In Section B, the performance of the candidates is regarded as *Weak* if the scores ranged from 0 to 5.5 marks, *Average* if the scores ranged from 6 to 10 marks, and *Good* if the scores ranged from 10.5 to 15 marks.

Samples of the candidates' responses in each question and figures have been provided to illustrate their responses, and the performance in each question respectively. colours have been used to show the performance of the candidates in each question and topic whereby *green* indicates good performance, *yellow* for average performance, and *red* for weak performance.

It is expected that, the report will be useful to educational stakeholders, tutors and student teachers to improve the teaching and learning process in Information and Communication Technology subject.

2.0 ANALYSIS OF THE CANDIDATES' PERFORMANCE IN EACH QUESTION

2.1 SECTION A: Short Answer Questions

This section had 10 compulsory questions, each with 4 marks, making a total of 40 marks. The candidates were required to attempt all questions.

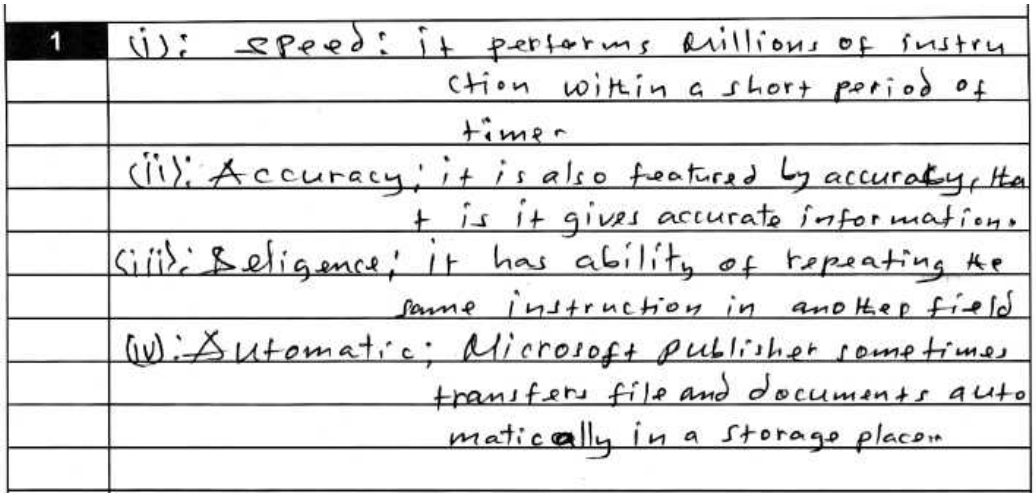
2.1.1 Question 1: Generic software application

The question required candidates to identify four features which make Microsoft publisher unique when compared to other computer applications. A total of 1,733 (100%) candidates attempted this question, where 1,644 (94.9%) candidates scored 0 to 1.5 marks which is a weak performance, 81 (4.7 %) candidates scored 2 to 2.5 marks and 8 (0.5%) candidates scored 3 to 4 marks. Statistics shows that the candidates' performance in this question was poor since 94.9 per cent scored 0 to 1.5 marks. Table 1 illustrates candidates' performance in this question.

Table 1: **Candidate's Performance in Question 1**

No.	Scores	Number of candidates	Percentage
1.	0.0 - 1.5	1644	94.9
2	2.0 - 2.5	81	4.7
3	3.0 – 4.0	0.5	8

The analysis shows that, 94.9 per cent of candidates who scored 0 to 1.5 were not able to respond to the question correctly. Candidates under this category failed to identify features which make Microsoft publisher a unique application program compared to others. Some candidates wrote the characteristics of computer, while others wrote functions of Microsoft publisher such as; *publisher can perform different tasks, used for calculations, it saves time to prepare and it controls Microsoft program in a computer*. Others wrote advantages of computer network while identifying one feature of Microsoft publisher as follows; *it allows centralization of key resources, easy to configure, connects two or more computer users, contains images, shapes and texts.* Extract 1.1 shows an incorrect response from one of the candidates.



Extract 1.1: A Sample of an incorrect response to question 1

In extract 1.1, the candidate wrote the characteristics of computer instead of unique features of Microsoft publisher.

On the other hand, 81(4.7%) candidates scored 2 to 2.5 marks indicating average performance. In this group, candidates were able to list two points which indicate that they had limited understanding on the concept as they wrote; *Microsoft publisher contains different templates, to prepare certificates and greeting cards, improve learning intention of students, to draw charts and graphs and Capability to send and receive documents*. In this context candidates managed to answer correctly the first two points and they were incorrect in the last two points.

Further analysis shows that, 0.5 per cent of candidates who scored 3 to 4 marks managed to list correctly some features of Microsoft publisher. This indicates that they had sufficient knowledge on what constitute Microsoft publisher such as; *how a program can do to effect text, shapes and images, Ability of the program to combine pictures and text to make professional flyers and detailed ruler to guide for correct measurement*. Extract 1.2 shows a correct response from one of the candidates.

1	
(i)	Characterized by unique background themes that make to be different.
(ii)	It characterized by different formats of work that can make easy to user in using
(iii)	Characterized by editing / making of the text and printing.
(iv)	Characterized by Automation operation eg spelling checks, grammar check, copying

Extract 1.1: A sample of a correct response to question 1

2.1.2 Question 2: Computer and Networks

The question required candidates to describe two usefulness of bus and star topologies in establishing a Local Area Network (LAN) to facilitate communication and sharing of resources. A total of 1,733 candidates attempted this question, out of which 1,391 (80.1%) candidates scored 3 to 4 marks, 193 (11%) candidates scored between 2 and 2.5 marks and 149 (8%) candidates scored 0 to 1.5 marks. The data shows that the candidates' performance in this question was good, since 91.1 percent scored 2 to 4 marks. Figure 2 illustrates candidates' performance in this question.

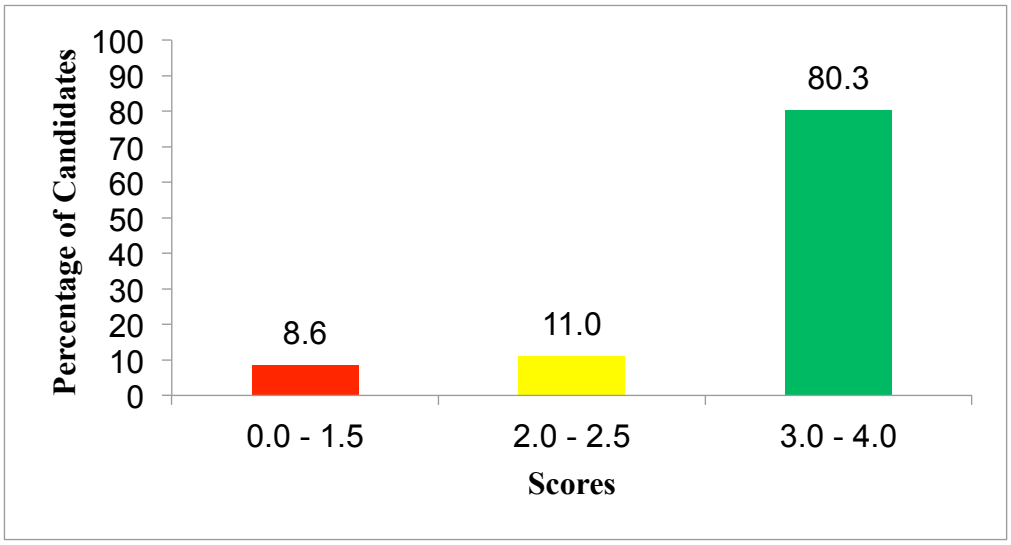
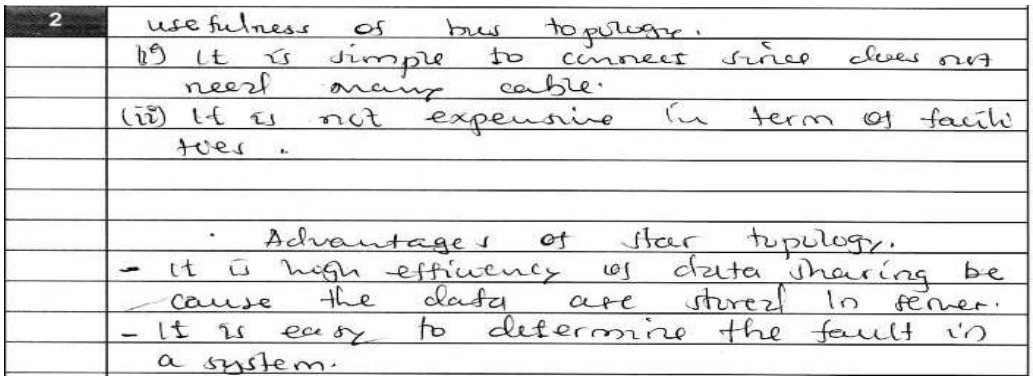


Figure 2: *Candidates' Performance in Question 2*

Statistics shows that, 80.1% candidates scored 3 to 4 marks. These candidates were able to elaborate usefulness of the bus and star topologies for the establishment of Local Area Network. The responses provided were; *bus topology is easier to install, it is less expensive, while star topology, is easier to configure, failure of one device allows another device to operate. in bus topology, less resources like cables for its installation is required,* while in star; *no traffic of data or information can appear*. Such responses imply that the candidates had adequate knowledge on bus and star topologies as used for LAN. Extract 2.1 shows a correct response from one of the candidates.


2

usefulness of bus topology.

(i) It is simple to connect since does not need many cable.

(ii) It is not expensive in term of facili ties.

· Advantages of star topology.

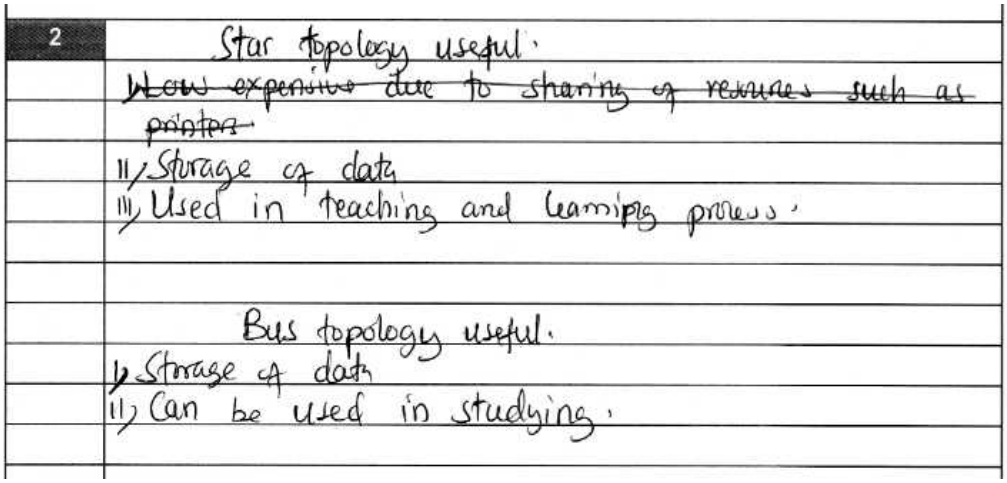
- It is high efficiency of data sharing be cause the data are stored in server.
- It is easy to determine the fault in a system.

Extract 2.1: A sample of a correct response to question 2

Moreover, other candidates (11%) scored from 2 to 2.5 marks. These candidates had limited understanding on the usefulness of bus and star topologies for the establishment of Local Area Network. Some of them managed to point out only two ways while others provided two correct ways and mixed up with the general important of the computer network. For example one candidate wrote; *both bus and star topology creates an environment to share information among nodes, star topology is difficult to install, bus topology has low cost, star topology is the devices are connected to the central.* Furthermore, some candidates were able to mention only the usefulness of bus topology and failed to write on star topology and vice versa. In this category, Candidates mentioned fields where the two topologies can be applied like in schools, hospitals and banks.

Statistics further postulates that 4.7 (8.6 %) candidates scored 0 to 1.5. These candidates lacked adequate knowledge on network topologies. Some had mixed ideas. Therefore, they wrote advantages of bus topology in the part of star topology. Others regarded a word star as a teaching aid and not a network

topology. Others wrote on importance of a networked computer such as; it helps *in sharing of resources used for learning used to support admission process*. Extract 2.2 shows incorrect response from one of the candidates.



Extract 2.2: A sample of an incorrect response to question 2

In extract 2.2, a candidate provided the uses of star and bus topologies instead of explaining their advantages.

2.1.3 Question 3: Multimedia

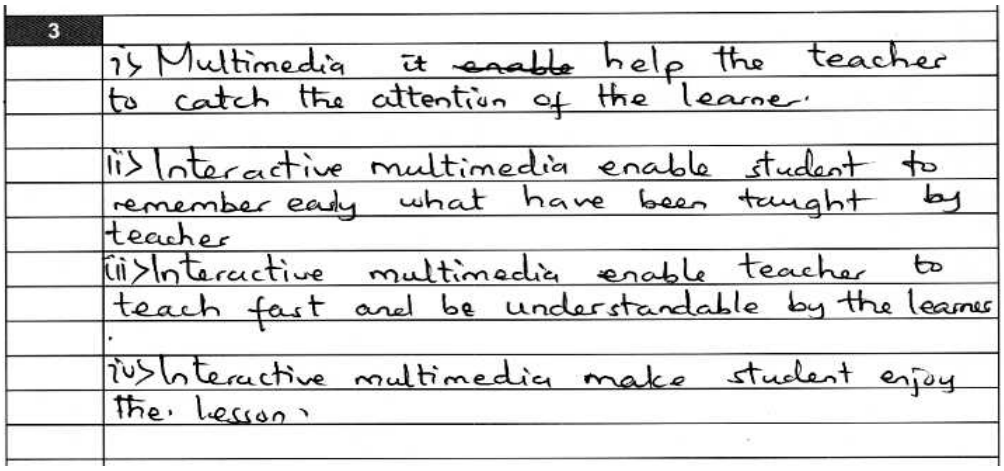
In this question, candidates were supposed to give four reasons, as to why there is a need to use interactive multimedia in the teaching and learning process. A total of 1,733 (100%) candidates attempted this question, out of which 1,715(99%) scored 3 to 4 marks, 11 (0.6%) scored 2 to 2.5 marks and 7 (0.4%) candidates scored 0 to 1.5 marks. Data shows that, the candidates' performance in this question was good, since 99.6 per cent scored above 2 marks. Table 3 illustrates candidates' performance in this question.

Table 3: **The candidates' Performance in Question 3**

No.	Scores	Number of candidates	Percentage
1	0.0 – 1.5	07	0.4
2	2.0 – 2.5	11	0.6
3	3.0 – 4.0	1715	99.0

The statistics shows that 99 percent of the candidates who scored high marks understood the question as they were able to give reasons to deploy interactive multimedia in the teaching and learning process. Some of the responses were;

interactive multimedia helps to raise the interest of learners, keeping long term memory of what they have learned and *facilitates the teaching of complex ideas*. Extract 3.1 shows the correct response from one of the candidates.


3

i) Multimedia it ~~enable~~ help the teacher to catch the attention of the learner.

ii) Interactive multimedia enable student to remember eady what have been taught by teacher

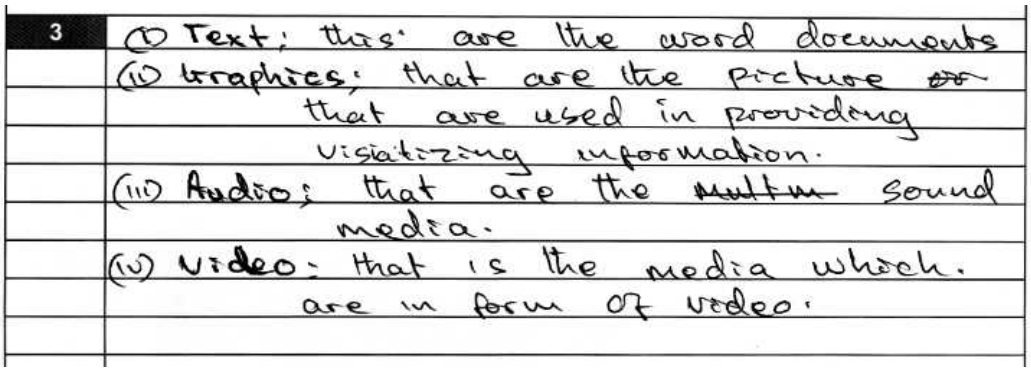
iii) Interactive multimedia enable teacher to teach fast and be understandable by the learner.

iv) Interactive multimedia make student enjoy the lesson.

Extract 3.1: A sample of a correct response to question 3

In addition, 11 (0.6%) of candidates scored 2 to 2.5 marks indicating average performance. These candidates had average understanding on the importance of interactive multimedia in teaching and learning process, thus they managed to write two points. Some repeated the same point in a different way, For example, one candidate wrote; *interactive multimedia attracts learners* at the same time the candidate wrote; *interactive multimedia motivates learners* as the second separate point.

On the other hand, 7 (0.4%) candidates scored 0 to 1.5 marks. These candidates lacked knowledge on the content tested. For example, one candidate wrote; *linear and non-linear multimedia*, the other one wrote on types of multimedia; *text, audio, video and animations* other candidates did not attempt this question. Extract 3.2 shows incorrect response from one of the candidates.



Extract 3.2: A sample of an incorrect response to question 3

In extract 3.2 the candidate wrote examples of multimedia resources instead of the importance of multimedia resources.

2.1.4 Question 4: Computer and Networks

In this question, candidates were supposed to explain four stages that computers undergo during booting process. The question aimed at examining students understanding on the booting process of the computer.

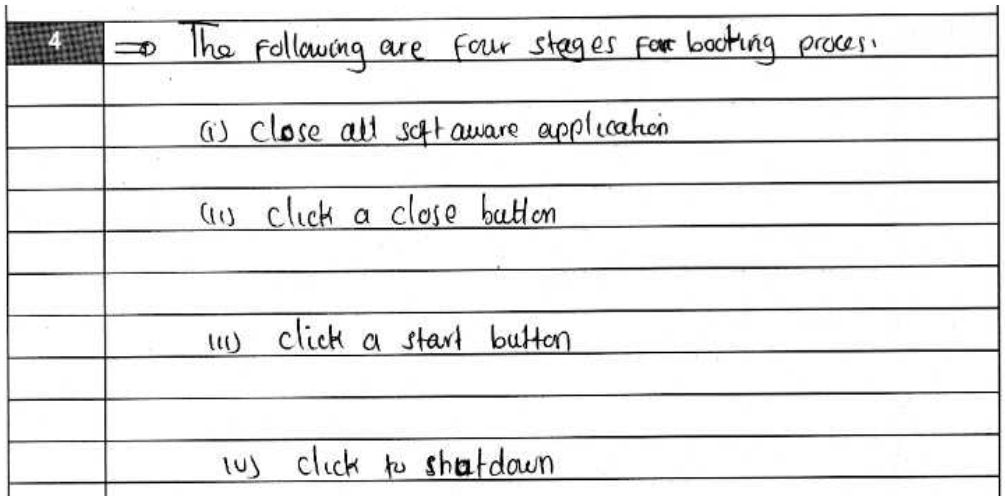
A total of 1,733 (100%) candidates attempted this question, of which 1724 (99.5%) scored 0 to 1.5 marks, and 11(0.5%) candidates scored 2 to 2.5 marks. The data shows that the candidates' performance in this question was poor, since 99.5 per cent scored 0 and 1.5 marks. Table 4 illustrates candidates' performance in this question.

Table 4: Candidates' Performance in Question 4

No.	Scores	Number of candidates	Percentage
1.	0.0 – 1.5	1724	99.5
2	2.0 – 2.5	11	0.5
3	3.0 – 4.0	1	0.1

The detailed analysis showed that, 99.5 per cent of candidates who scored 0 to 1.5 failed to understand the question requirement and they lacked adequate knowledge on the processes the computer undergoes during the booting process. To some candidates, the booting process was regarded as installation process. With that interpretation the candidates wrote; *select restart computer, click restart to allow booting*, *press ok, the computer will be booting*. Others wrote; *select switch off, switch on, select a word boot and click on to start*

booting. The idea in this context was that, booting was regarded as a process to install a certain program. Others wrote the types of booting; *warm and cold booting*. Extract 4.1 shows an incorrect response from one of the candidates.

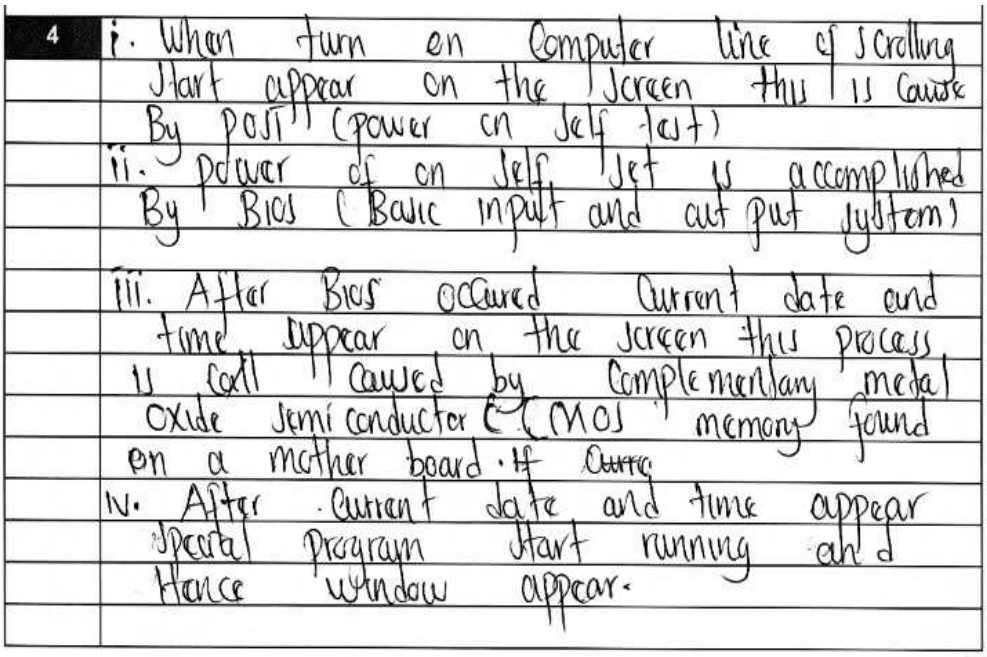


Extract 4.1: A sample of an incorrect response to question 4

In extract 4.1, a candidate wrote stages that a computer user follows during the shutting down of the computer while mixing up with the starting of the computer.

On the other hand, 11 (0.5%) candidates scored 2 to 2.5 marks. These candidates failed to mention all points clearly since they had partial knowledge of the booting process. For example, one of the candidates wrote; *Post and IF*. Some managed to explain only a single stage of switching on the computer and failed to explain the rest of the process. This led them to score half of the four allocated marks.

Statistics shows that 1(0.1%) of the candidates scored 3 to 4 marks. These candidates were able to explain clearly the stages the computer undergoes during the booting process. They demonstrated adequate knowledge and understating of the booting process as they wrote; *turn on the computer, POST, computer to read some instructions, operating system.* Extract 4:2 shows sample correct response from one of the candidates.



Extract 4.2: A sample of a correct response to question 4

2.1.5 Question 5: Social economic and cultural aspects of ICT

The question demanded the candidates to elaborate impacts of spending many hours in using mobile phones, computers, watching television and listening to the radio. The question intended to examine students understanding on negative side of excessive usage of ICT devices.

A total of 1,733 (100%) candidates attempted this question, of which 89 (5.1%) candidates scored 0 to 1.5 marks, 92 (5.3%) candidates scored 2 to 2.5 and 1,552 (89.6%) scored 3 to 4. The data shows that the candidates' performance in this question was good, since 94.9% per cent scored 2 to 4 marks. Figure 5 illustrates candidates' performance in this question.

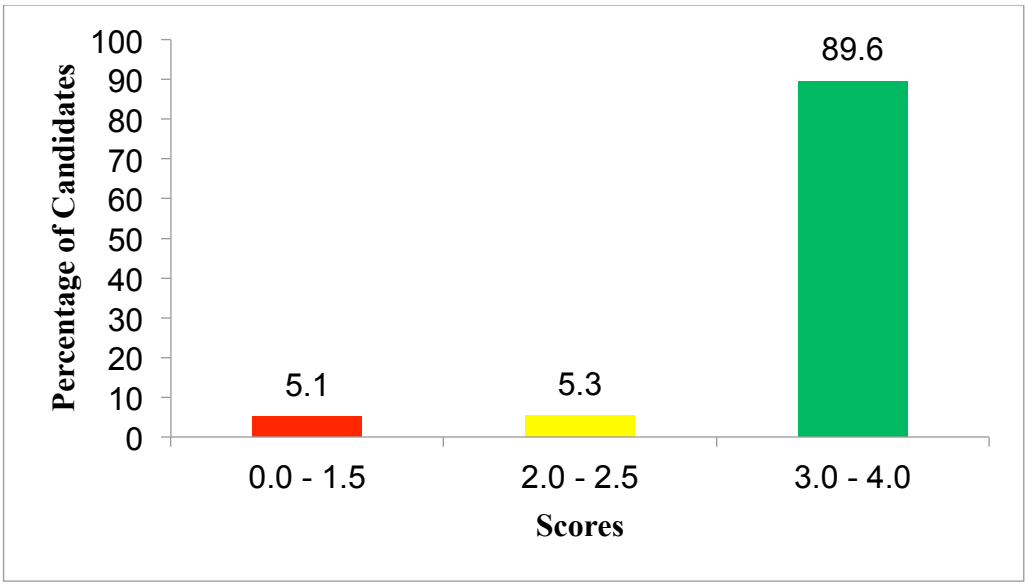
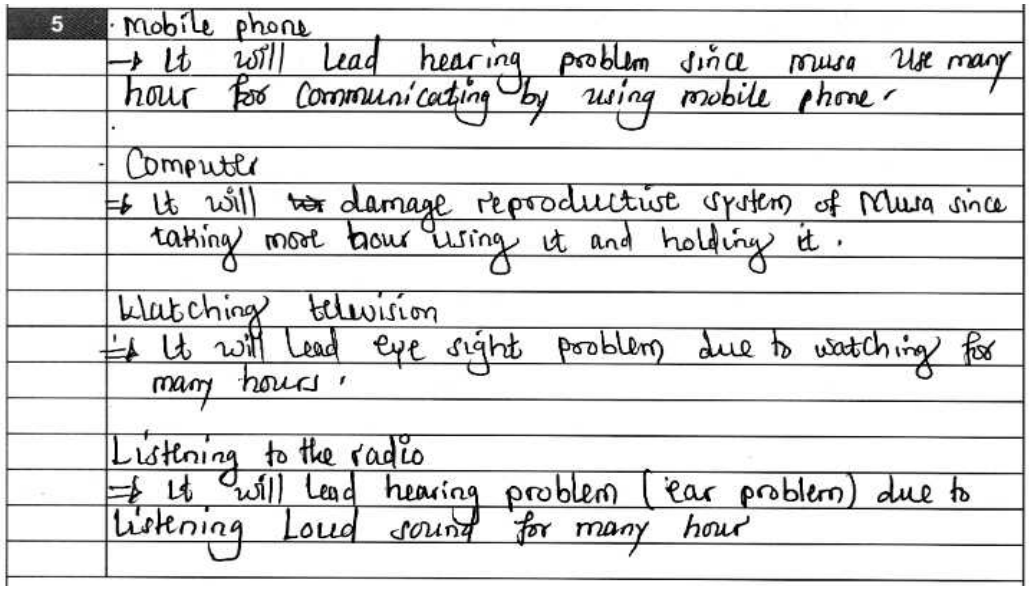


Figure 5: *Candidates' Performance in Question 5*

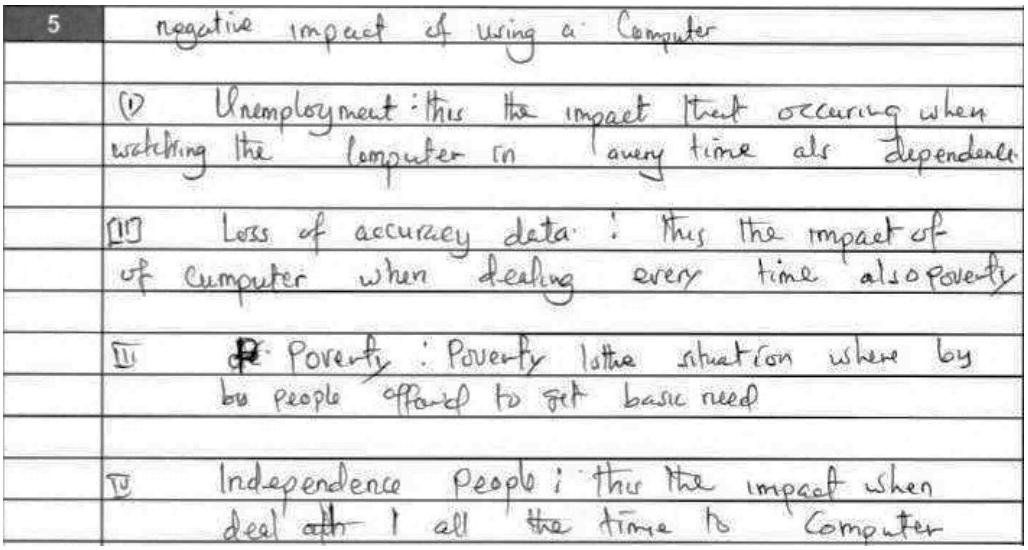
Statistics shows that, 1,552 (89.6%) candidates scored high marks due to their understanding on the negative impact of the use of ICT devices. They were aware of the health hazards a person may get by using the mentioned devices for a long time. Some candidates wrote; *watching television and computers for a long time may cause eye destruction, loud sound from radio may cause hearing impairment* Extract 5:1 shows the correct response from one of the candidates.



Extract 5.1: A sample of a correct response to question 5

On the other hand, 92 (5.3 %) candidates who had average performance mentioned the points without giving explanations. Some explained correctly two points and failed to explain the other two. For example one of the candidates wrote; *laziness, eye problem, dizziness and headache* without giving explanations.

Furthermore, 89 (5.1%) candidates scored 0 to 1.5 marks. Most of the candidates under this category had insufficient knowledge on the health problems caused by excessive time spent on ICT devices usage. Though few managed to write correctly one point such as; *watching television for a long time my cause eye problem computers can affect brain and destroy eye lens*, *watching television is time consuming,* others relied on the problems caused by the ICT devices in the community such as unemployment, social and crimes. Extract 5.2 shows incorrect response from one of the candidates.



Extract 5.2: A sample of an incorrect response to question 5

In extract 5.2, candidate's responses were things related to problems that are associated with the development of ICT to the community instead of the health problem a person may get when spending much time using ICT devices.

2.1.6 Question 6: Multimedia

The question required candidates to explain four benefits of using audio – visual materials in teaching and learning process. A total of 1,733 (100%) candidates attempted this question, of which 15 (0.9%) candidates scored 0 to 1.5 marks, 37 (2.2%) scored 2 to 2.5 and 1,681 (97%) scored 3 to 4. The data shows that the candidates' performance in this question was good, since 99.2 % per cent scored 2 to 4 marks. Figure 5 illustrates candidates' performance in this question.

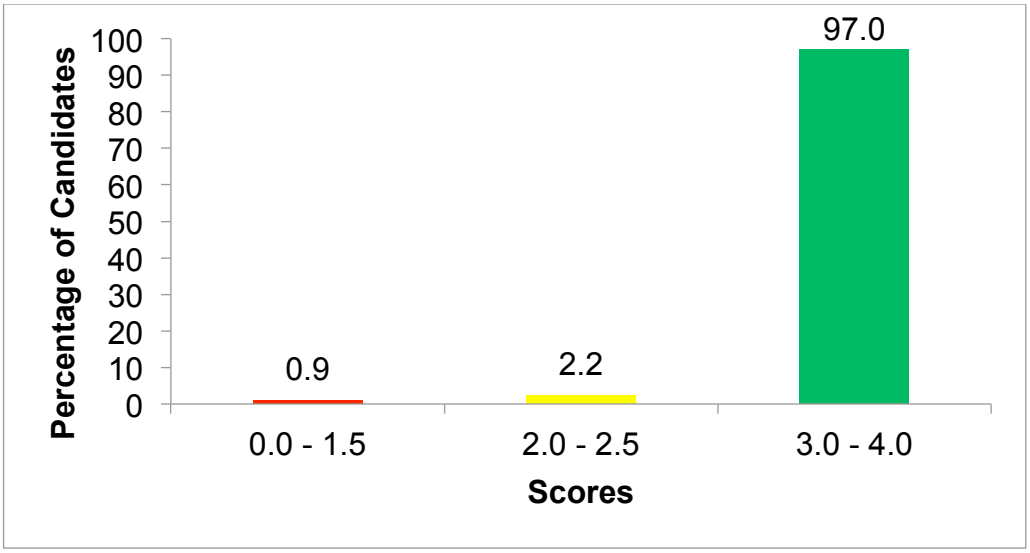


Figure 6: *Candidates' Performance in Question 6*

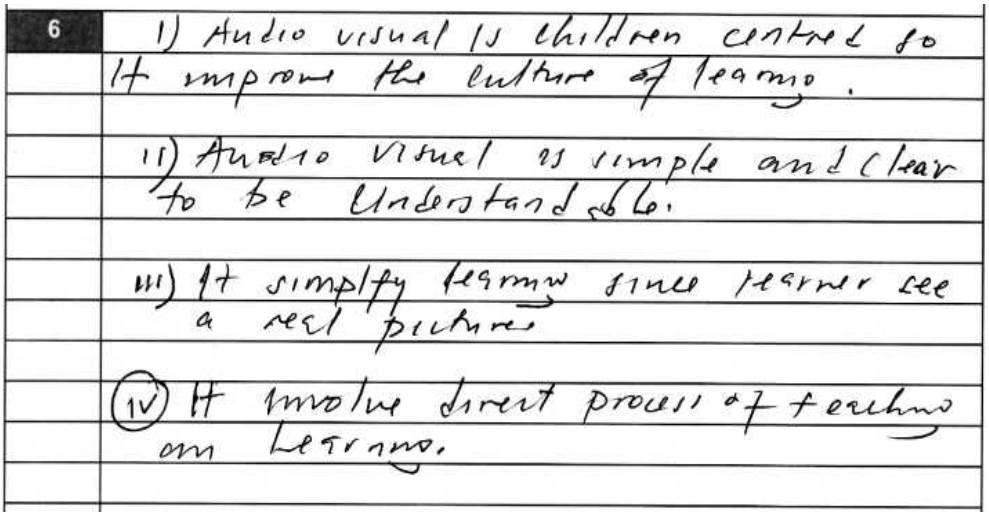
The analysis shows that, 1,671(97%) candidates scored 2.5 to 4.0 marks. This is an indication that the candidates had adequate knowledge on the benefits of audio-visual materials in teaching and learning process. Some candidates wrote: *helps visual impaired to understand the lesson, can help to solve language barrier* while other candidates wrote; *it reduces teacher talking time and can be used to motivate learners*. Extract 6.1 shows sample of a correct response from one of the candidates.

6	Benefit of audio - visual material
	(i) Audio - visual material give more illustration of what had bean taught theoretically.
	(ii) Enable a person (learner) to have multi advantage of see and hear the media.
	(iii) Audio-visual can save and reduce time that could be spent in other local materials like chalk board.
	(iv) Audio - visual, motivate, reinforce and create mood and curiousity to both teachers and learners.

Extract .6:1 A sample of a correct response to question 6

Moreover, 37 (2.2%) candidates scored 2 to 2.5 marks. These candidates had an average performance as they failed to write the required points. Some mentioned two points while others wrote irrelevant points. For instance, one candidate wrote; *audio- visual material is a source of enjoyment.* Others provided points without explanation as they left points hanging. For example one of them wrote; *it arise leaners attention*, *help to the growth of learning interest*. This might have been caused by insufficient English ability the candidate had.

The other (0.9%) candidates scored 0 to 1.5 marks due to failure to mention all four points clearly. However, this group understood the question but had limited explanations to meet the question demands. For example, they wrote; *audio visual can be used for refencing ,is used to make reflection of real-life situation.* Extract 6.12 shows a sample of incorrect response from one of the candidates.



Extract 6.2: A sample of an incorrect response in question 6

In extract 6.2, the candidate wrote types of teaching and learning methodologies, qualities of teaching and learning materials instead of benefits of using audio–visual materials in the teaching and learning process.

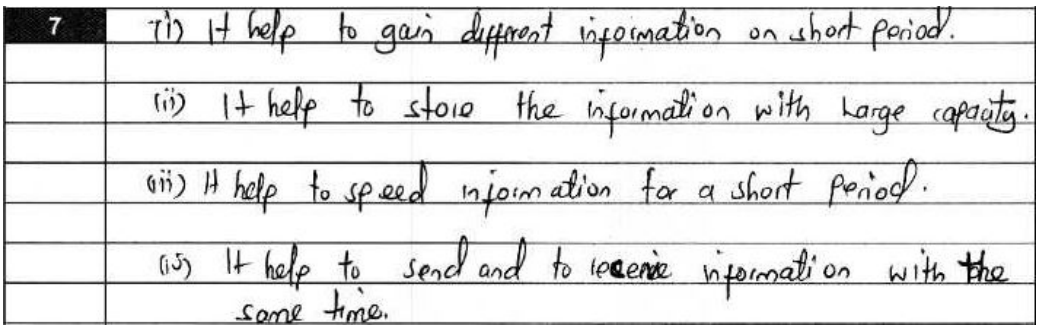
2.1.7 Question 7: Computer basics and Networks

In this question candidates were required write four threats that may occur if the computer is connected to a network. The question aimed at examining candidates understanding of problems associated by the use of computer networks. A total of 1,733 (100%) of candidates attempted this question, of which 1,716 (99%) candidates scored 0 to 1.5 marks, 13 (0.8%) scored from 2 to 2.5 marks and 4(0.2) candidates scored 3 to 4 marks. The data shows that the candidates' performance in this question was extremely poor since 99 per cent scored 0 to 1.5 marks. Table 7 shows the summary of candidates' performance in this question.

Table. 7: Candidates' Performance in Question 7

No.	Scores	Number of candidates	Percentage
1.	0.0 - 1.5	1716	99.0
2	2.0 - 2.5	13	0.8
3	3.0 – 4.0	4	0.2

The analysis shows that, 99.0 per cent of candidates who scored 0 to 1.5 lacked knowledge on the threats that may occur if the computer is connected to a network. For example one of the candidates wrote; *connection of resources, searching for materials*, *distributes segments, threaten security.* All the three points the candidate wrote were incorrect. Extract 7.2 shows a sample of an incorrect response from one of the candidates.

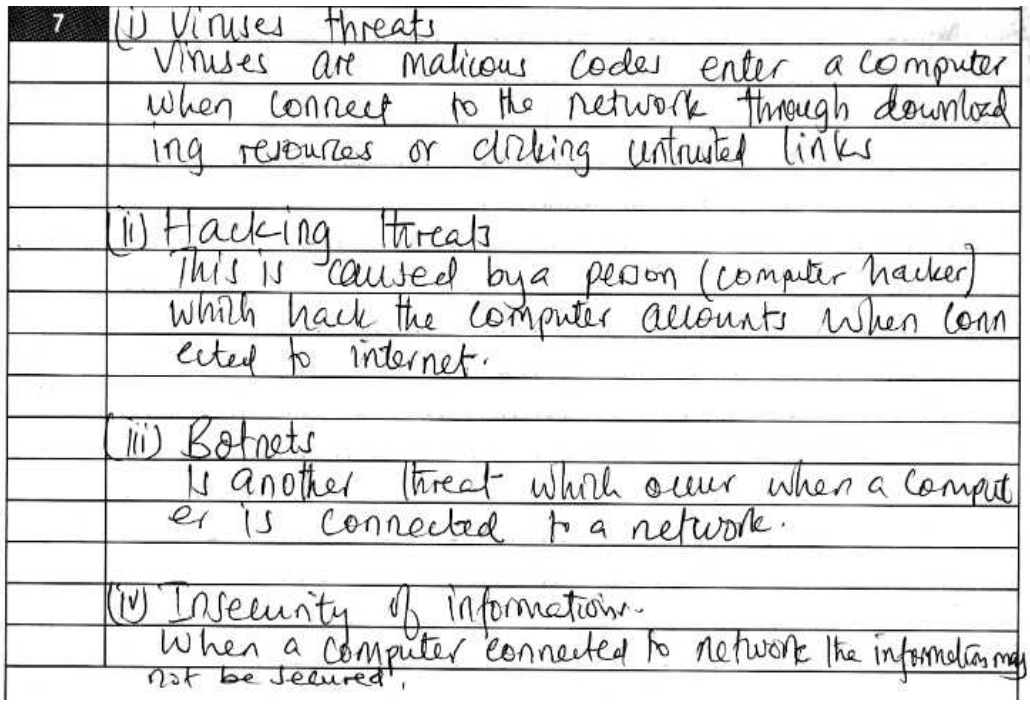


Extract 7.1: A sample of an incorrect response to question 7

In extract 7.1 a candidate explained various importance of the computer which is connected to the network instead of focusing on the threats that may occur.

On the other hand, 13 (0.8%) candidates had average performance as they failed to write all the four points required. Some mentioned only two while others wrote irrelevant points. For example one candidate wrote; *the system can be hacked and hence affect the important information*. Another candidate wrote; *decline of moral values due to the interactivity between users*. These candidates had this as the only correct points but they failed to write other points. In adequacy of basic computer network knowledge, made the candidates to fail to provide all the required points, they thus scored half marks.

Detailed statistics showed that, 4(0.2%) candidates scored 3 to 4 marks. These candidates managed to write various threats that may occur when the computer is connected to the network. Their responses are the evidence that they had enough knowledge on computer network. Some of the candidates in this group wrote; *it leads to the increase in crimes and distortion of our culture*, *faults may occur due to failure of one computer*. Extract 7.2 shows the sample of correct response from one of the candidates.


7

(i) Viruses threats
Viruses are malicous codes enter a computer when connect to the network through downloading resources or clicking untrusted links

(ii) Hacking threats
This is caused by a person (computer hacker) which hack the computer accounts when connected to internet.

(iii) Botnets
Is another threat which occur when a computer is connected to a network.

(iv) Insecurity of information.
When a computer connected to network the information may not be secured.

Extract 7.2: A sample of a correct response to question 7

2.1.8 Question 8: Generic software application

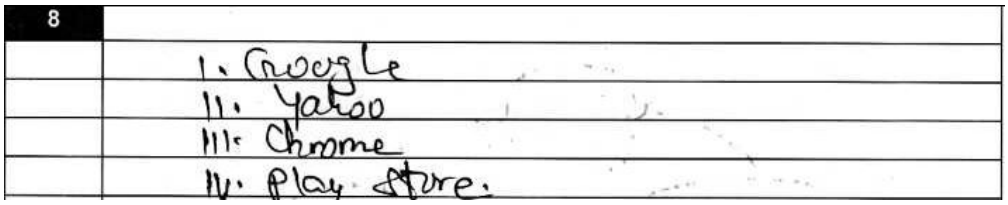
In this question, a candidate was required to write four types of database system that teachers can practice in their IPADs. The question intended to examine candidates understanding on types of database.

A total of 1,733 (100%) candidates attempted this question, of which 1,718 (99.1%) scored 0 to 1.5 marks, 12 (0.7%) scored between 2 and 2.5 marks and 3 (0.2%) scored 3 to 4 marks. The data shows that the candidates' performance in this question was poor, since 99.1 per cent scored 0 to 1.5 marks. Table 8 illustrates candidates' performance in this question.

Figure 8: Candidates' Performance in Question 8

No.	Scores	Number of candidates	Percentage
1.	0.0 - 1.5	1718	99.1
2.	2.0 - 2.5	12	0.7
3.	3.0 – 4.0	3	0.2

The analysis showed that, 99.1 per cent of candidates who scored 0 to 1.5 marks were not knowledgeable on database system. Candidates under this category failed to explain four database systems to practice in their IPADs. Some candidates in this group wrote about characteristics of computer. For example, one candidate wrote; *database operating systems, database storing information, database open source, and database access system* as types of database systems but the three responses were incorrect. Another with the same idea wrote; *query, double entry 1 and 2, double entry and folder and object oriented*. Extract 8.1 shows a sample of an incorrect response from one of the candidates.

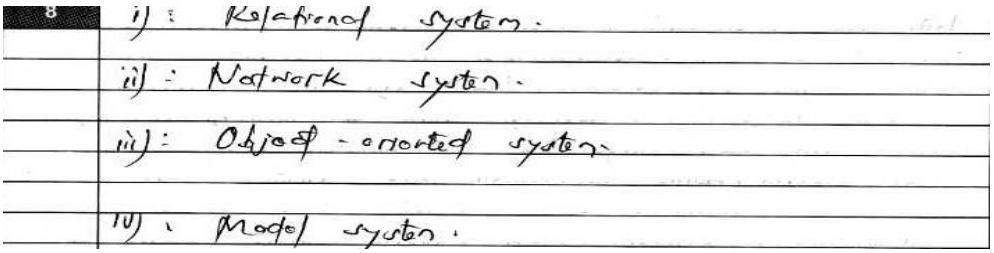


Extract 8.1: A sample of an incorrect response to question 8

In extract 8.1 the candidate mentioned search engines and android application store instead of describing databases.

On the other hand,13(0.8%) candidates had average performance as they failed to explain four database systems. Some mentioned only two out of four points while others wrote irrelevant points.For example one candidate wrote; *text database and form database,irrational database,object oriented database and distributed database.*

Further statistics showed that, 3 (0.2%) candidates scored 3 to 4 marks. These candidates understood the question and they had the required knowledge and skills on the types of database. They were able to list three or all the four points correctly. Extract 8.1 shows a correct response from one of the candidates.



Extract 8.2: A sample of a correct response to question 8.

Question 9: Fundamentals of Information and Communication Technology

In this question, candidates were required to write four distinctive features between data and information. A total of 1,733 (100%) candidates attempted this question, of which 218 (12.5%) scored 0 to 1.5 marks, 216 (12.5) scored 2 and 2.5 and 1,299 (75%) candidates scored 3 to 4 marks. The data showed that candidates' performance in this question was good, since 87.5 per cent scored 2 to 4 marks. Figure 9 illustrates candidates' performance in this question

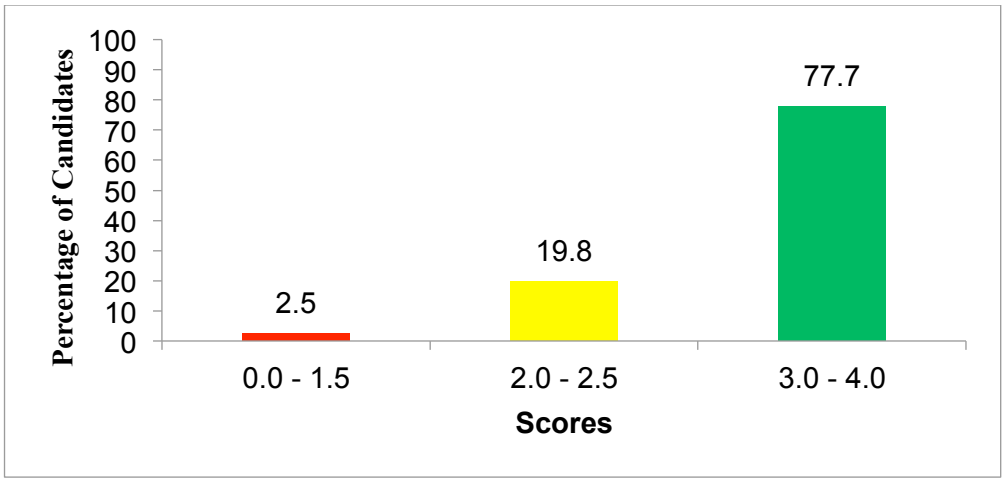
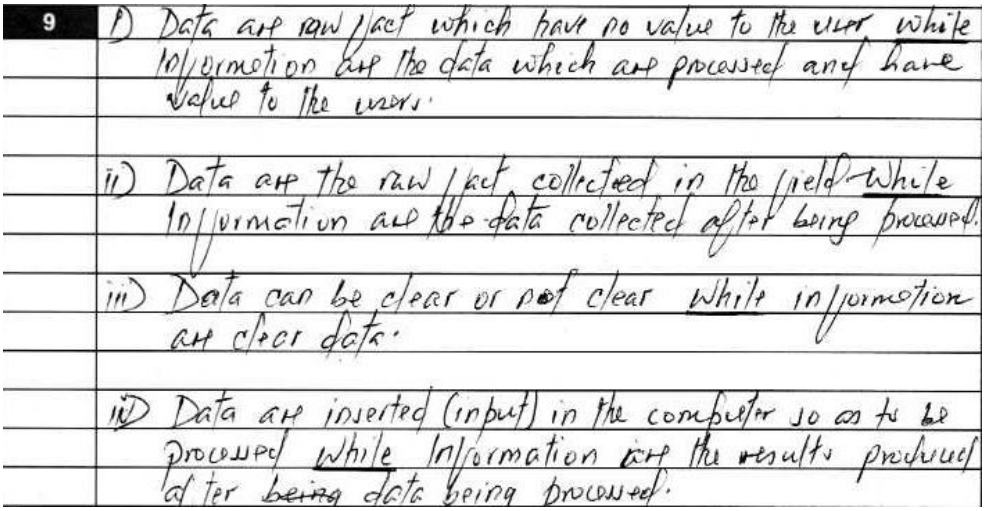


Figure 9: *The candidates' Performance in Question 9*

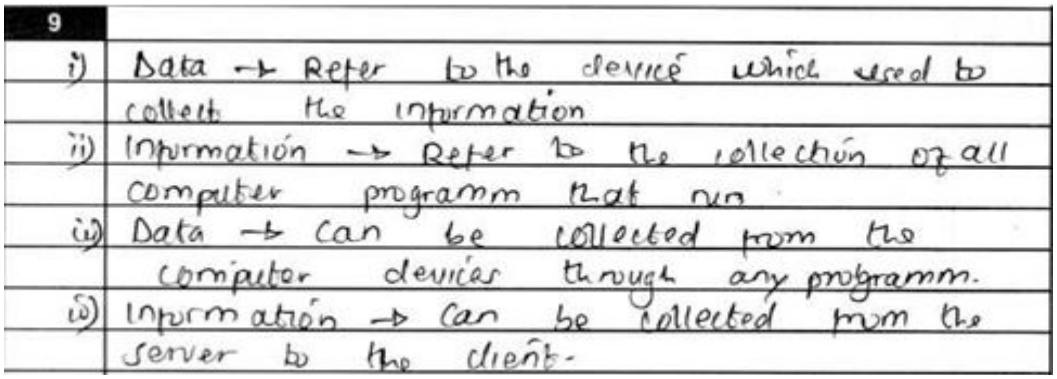
The statistics showed that, 1,299 (75%) candidates scored 3 to 4 marks. This is an indication that candidates were knowledgeable on computer usage as they were aware that the computer is a machine which processes data to produce information. Thus the candidates would easily differentiate the two concepts. Some of the candidates wrote; data *is a collection of raw facts,* while *information is the processed data* others wrote; *data are not organized while information does*, *data has no meaning while information does* Extract 9.1 shows correct response from one of the candidates.



Extract 9.1: A sample of correct response to question 9

Further analysis shows that, 216 (12.5%) candidates scored average marks 2 to 2.5. These candidates had inadequate knowledge on the difference between data and information but they failed to get all points clearly. For example, one of them wrote; *data is found within a computer and information is found outside the computer, data is raw material in the industry, information is a device used to process data*. Others were able to mention points without giving explanations to each, though they got half marks.

Moreover, 218 (12.5%) candidates scored 1 0 to 1.5 marks. The candidates in this group misunderstood the question, as the result, they wrote about the types of data; *primary, secondary data, grouped data, discrete data*. Some candidates regarded data as a device; *data is a device to transfer knowledge from one place to another.* others wrote; *data is the part of information.* Extract 9.1 shows incorrect response from one of the candidates.



9	
i)	Data → Refer to the device which used to collect the information
ii)	Information → Refer to the collection of all computer programm that run
iii)	Data → Can be collected from the computer devices through any programm.
iv)	Information → Can be collected from the server to the client.

Extract 9.2: A sample of an incorrect response to question 9

In extract 9.2 the candidate did not give distinction between data and information ended in guessing the meaning of data and information.

2.1.9 Question 10: Computer and Network

In this question a candidate was required to explain how data flows to produce a document by using a diagram. The question intended to examine students understanding of the processes of hard copy production. A total of 1,733 (100%) candidates attempted this question of which 1,038 (59.9%) candidates scored 3 to 4 marks, 40 (2.3%) scored 2 and 2.5 marks and 645 (37.8%) candidates scored 0 to 1.5 marks. Data showed that candidate's general performance in this question is average since 62.2 percent scored 2 and 4 marks. Figure 10 illustrates candidates' performance in this question.

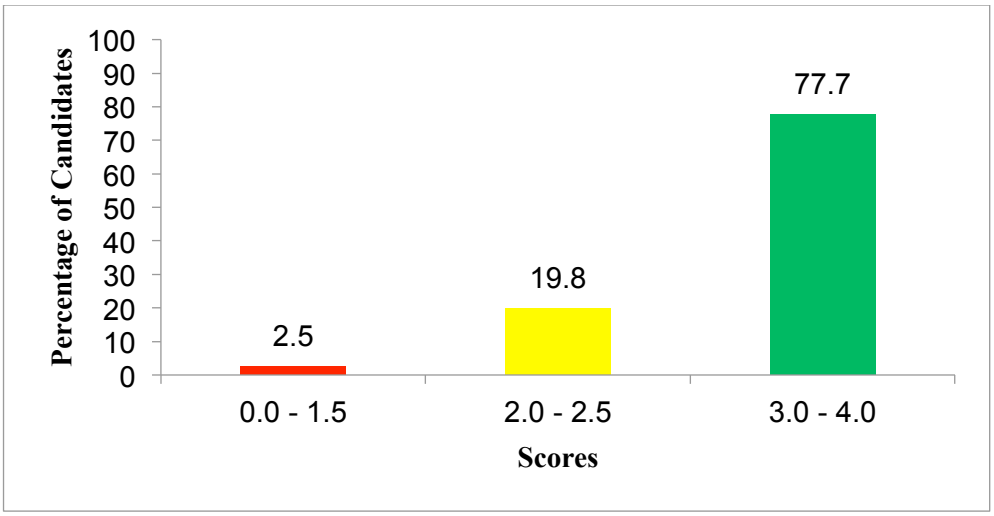
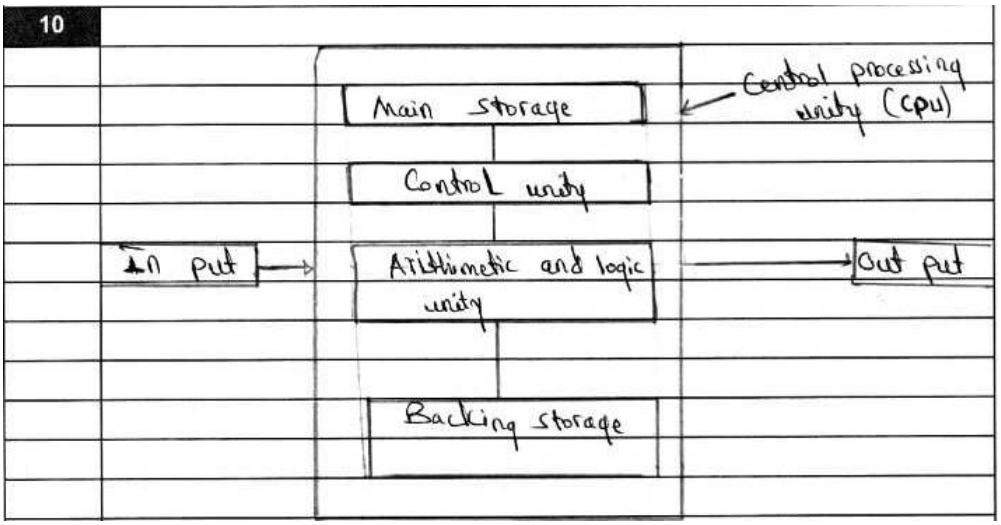


Figure 10: *Candidates' Performance in Question 10*

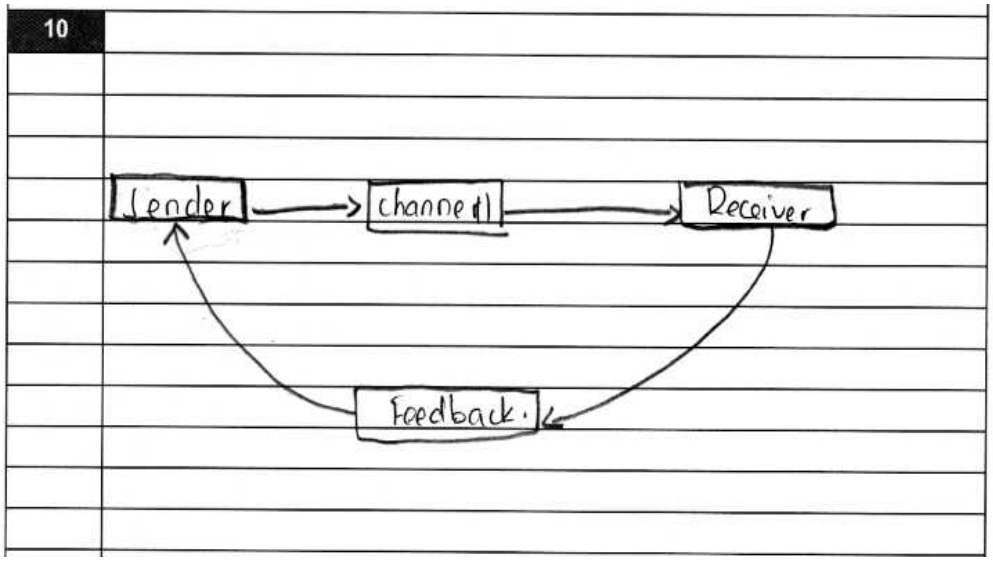
Statistics showed that 40 (2.3%) candidates scored 2.0 to 2.5 marks. Some of these candidates understood the question but they failed to draw a diagram to illustrate clearly how data flows to produce a document. Some managed to draw a stage of data input and output but they failed to explain other parts such as processing.

On the other hand, 1,038 (62.2%) candidates scored 3 and 4 marks. This indicates that, candidates had adequate knowledge and skills on the hard copy production in a computer. Many of the candidates under this category managed to produce clear diagram and explanations on how data flows to produce a document. They were able to draw diagram that showed data input, processing unit accompanied by memory/storage device and finally the output. Extract 10.1 shows a correct response to question 10.



Extract 10.1: A sample of correct responses to question 10.

Moreover, 645 (37.8%) candidates who scored 0 to 1.5 marks did not understand the demands of the question. Some of them wrote procedures of scanning a document, others wrote about processes of photocopying a document. Moreover, other candidates drew a flow chart diagrams which represents a summary of work flow in programming and not data flow in computers. It was also observed that other candidates wrote the processes of printing a document such as; *type a quiz on a computer, save that quiz and lastly print a quiz by using a printer.* Extract 10.2, shows incorrect response from one of the candidates.



Extract 10.2: A sample of an incorrect response to question 10

In extract 10.2, a candidate drew a diagram which illustrates communication process instead of processes for hard copy production.

2.2 SECTION B: Essay questions

In this section, there were 04 questions. Candidates were required to attempt all questions. Each question carried 15 marks to make a total of 60 marks.

2.2.1 Question 11: Generic Software Application

In this question, a candidate was required to explain five merits of using electronic file over physical file system in data storage. A total of 1,733 (100%) candidates attempted this question, of which 1,347 (77.7%) candidates scored 10.5 to 15 marks, 343 (19.8%) candidates scored 6 to 10 marks and 43 (2.5%) candidates scored 0 to 5.5 marks. Data showed that candidate's general performance in this question was good since 97.5 percent scored 6 to 15 marks. Figure 11 illustrates candidates' performance in this question.

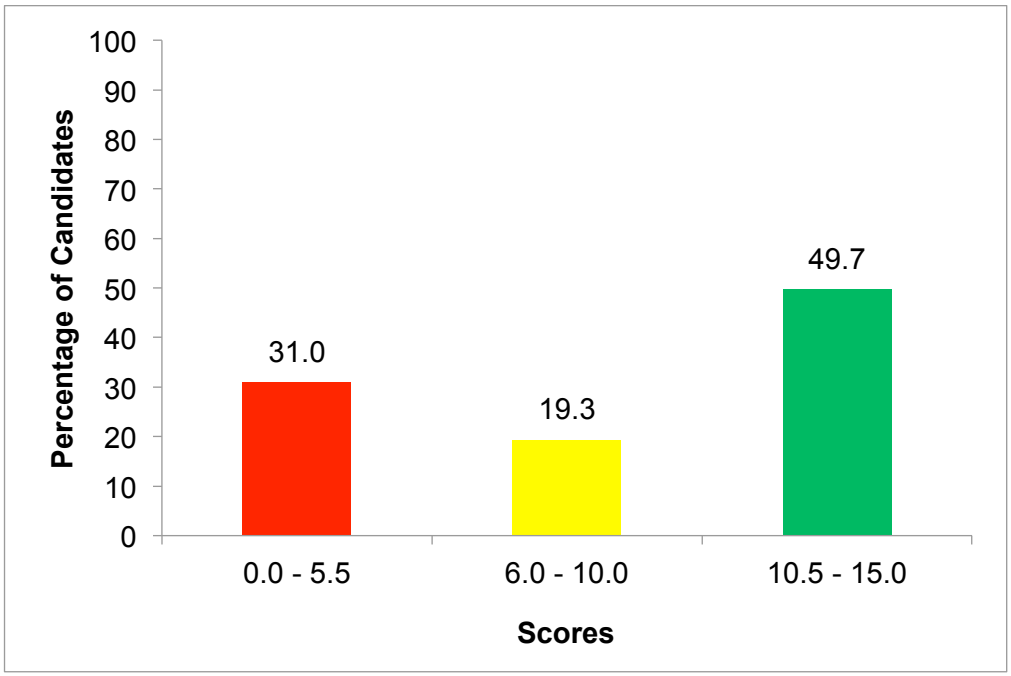
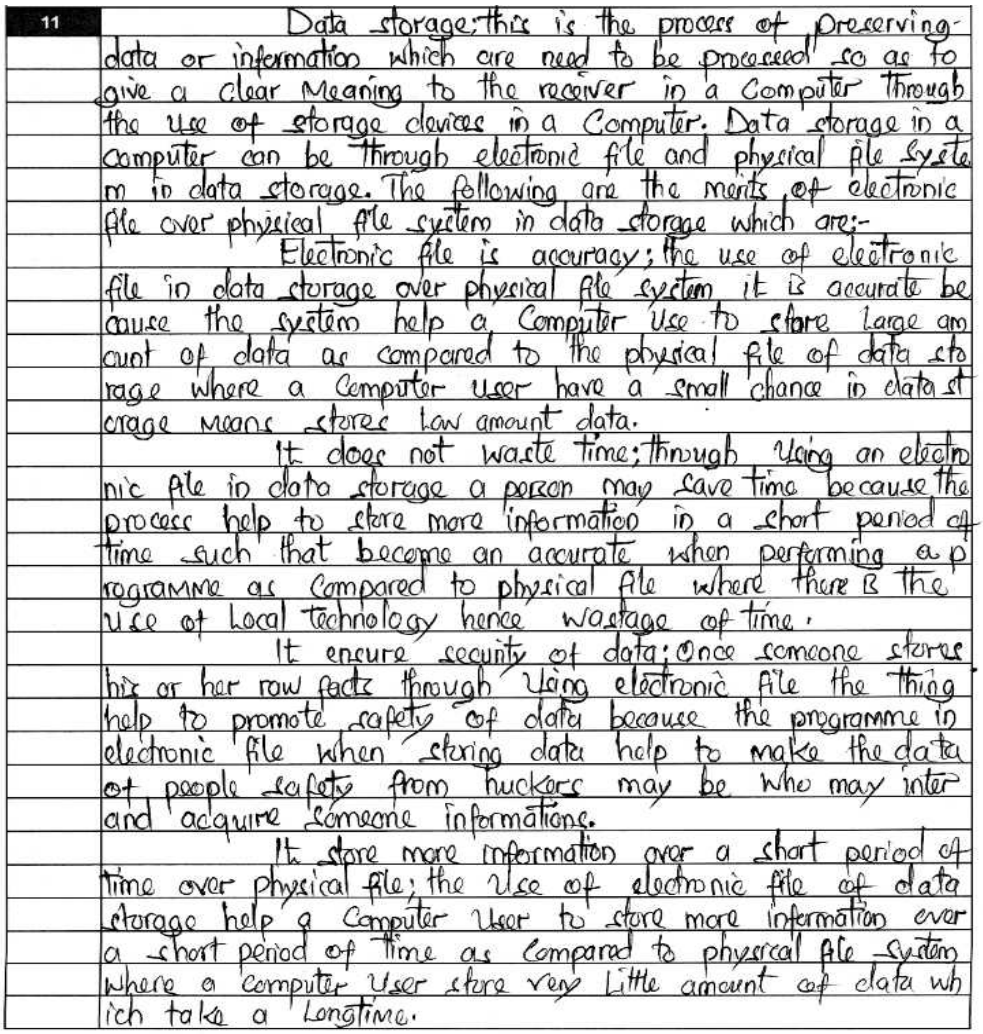


Figure 11: *Candidates' Performance in Question 11*

Further analysis showed that, 1,347 (77.7%) candidates scored 10.5 to 15 marks. This implies that, the candidates had adequate knowledge on merits of using electronic file over physical file system in data storage. Many of the candidates in this group were able to provide merits of electronic file as; *data*

stored in electronic means are more secure than in physical means, easy transferring of file, ability to store data permanently, *file updating*, *confidentiality of electronic files and environmental conservation*. Extract 11.1 shows a correct response from one of the candidates.



11

Data storage; this is the process of preserving data or information which are need to be processed so as to give a clear Meaning to the receiver in a Computer through the use of storage devices in a Computer. Data storage in a computer can be through electronic file and physical file system in data storage. The following are the merits of electronic file over physical file system in data storage which are:-

Electronic file is accuracy; the use of electronic file in data storage over physical file system it is accurate because the system help a Computer Use to store Large amount of data as compared to the physical file of data storage where a Computer user have a small chance in data storage means stores low amount data.

It does not waste time; through using an electronic file in data storage a person may save time because the process help to store more information in a short period of time such that become an accurate when performing a programme as Compared to physical file where there is the use of Local technology hence wastage of time.

It ensure security of data; Once someone stores his or her row facts through using electronic file the thing help to promote safety of data because the programme in electronic file when storing data help to make the data of people safety from huckers may be who may inter and acquire someone informations.

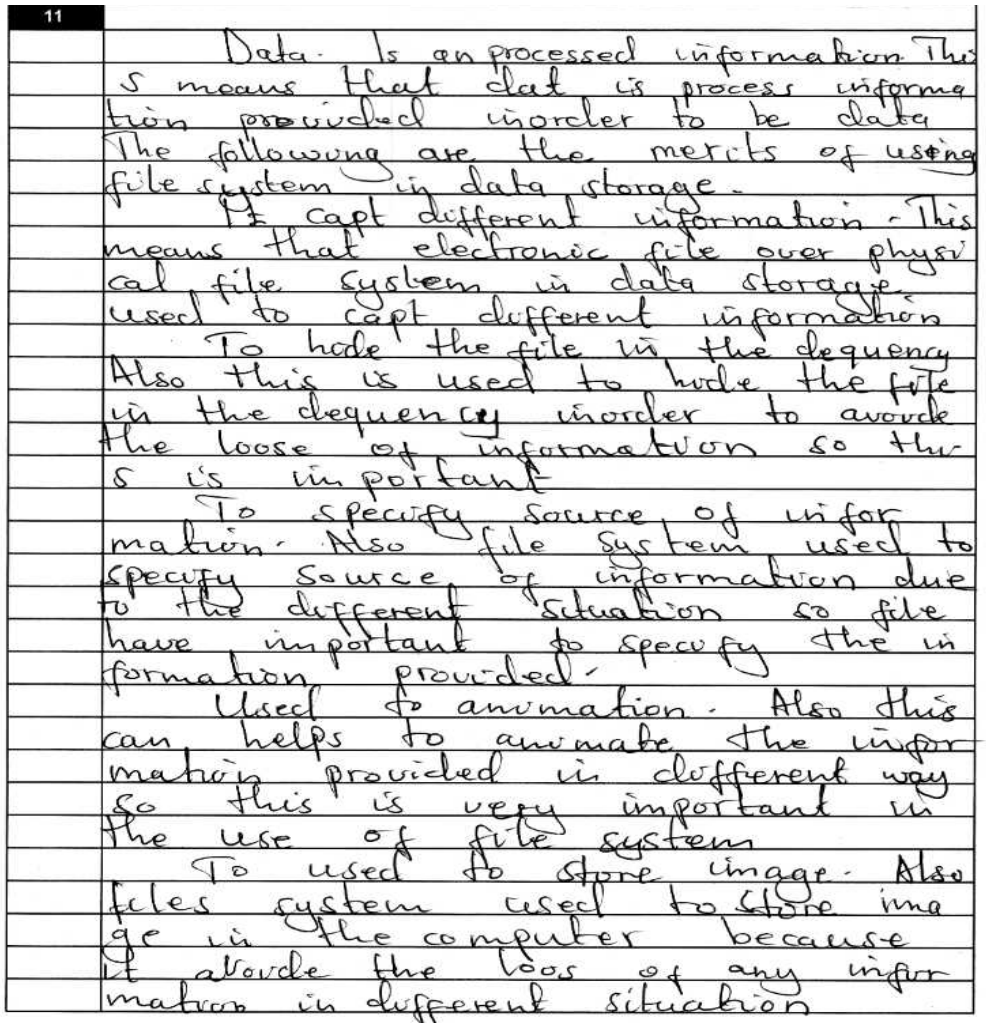
It store more information over a short period of time over physical file; the use of electronic file of data storage help a Computer User to store more information ever a short period of time as Compared to physical file system where a Computer User store very Little amount of data which take a Longtime.

Extract 11.1: A sample of a correct response to question 11

On the other hand, 343 (19.8%) candidates scored 6 to 10 marks. In this category, candidates failed to explain all five points correctly. For example, one of the candidates wrote; *electronic file enables calculations, electronic file can be stored for long time, electronic file is permanently stored in hard disc, electronic file are kept for future use, electronic file can be used to carry documents*. Some repeated the points and some wrote about advantages of using various program found in a computer. Some other candidates explained

five points but only two points were correct.

Moreover, 43 (2.5%) candidates scored 0 to 5.5 marks. These candidates had limited knowledge on the merits of electronic files. Some of them refereed an electronic file as files saved in the internet. Others mixed the features of an electronic file and computer storage. For instance one of the candidates wrote; *electronic file helps in getting information, electronic file reduces space, it is a connection with user account in ROM, electronic file is computer storage on a disc.* Others wrote some features available in other programs like Microsoft word such as; *electronic file helps in spelling check, highlighting texts, aligning documents, drawing charts and graphs*. Extract 11.2 shows an incorrect response from one of the candidates.


11

Data. Is an processed information. This means that dat is process information provided inorder to be data. The following are the merits of using file system in data storage.

It capt different information. This means that electronic file over physical file system in data storage. used to capt different information.

To hode the file in the dequency. Also this is used to hode the file in the dequency inorder to avoyde the loose of information so this is important.

To specify source of information. Also file system used to specify source of information due to the different situation so file have important to specify the information provided.

Used to animation. Also this can helps to animate the information provided in dufferent way so this is very important in the use of file system.

To used to store image. Also files system used to store image in the computer because it avoyde the loos of any information in dufferent situation.

Extract 11.2: A sample of an incorrect response to question 11

In extract 11.2, a candidate explained different computer related activities instead of explaining the importance of storing files electronically.

2.2.2 Question 12: Social economic and cultural aspects of Information and Communication Technology

This question required candidates to elaborate five employment opportunities which learning of Information and Communication Technology (ICT) offers to teachers. The question intended to examine students understanding on various employment opportunities offered by learning ICT. A total of 1,733 (100%) candidates attempted this question, of which 15 (0.9%) candidates scored 10.5 to 15 marks, 521(30.8%) candidates scored 6.0 to 10 marks and 1,185 (68.4%) candidates scored 0 to 5.5 marks. The data shows that the candidates' performance in this question was poor, since 68.4 per cent scored 0.0 to 5.5 marks. Table 13 illustrates candidates' performance in this question.

Table 12: Candidates' Performance in Question 12

No.	Scores	Number of candidates	Percentage
1.	0.0 - 5.5	1185	68.4
2	6.0 - 10	521	30.8
3	10.5– 15	15	0.9

More analysis showed that, 1,185 (68.4%) candidates scored 0 to 5.5 marks. These candidates did not have enough knowledge to elaborate five employment opportunities teachers may acquire by learning Information and Communication Technology (ICT). Some mixed the importance of ICT in teaching and learning process and the opportunities it offers, one of the candidates had the following response; *ICT helps teachers to keep students record, printing business cards to people, teachers are taught ICT so as to meet changes in advancement of science and technology, ICT can be used to keep administrative records*.. Extract 12.2 shows incorrect response from one of the candidates.

12

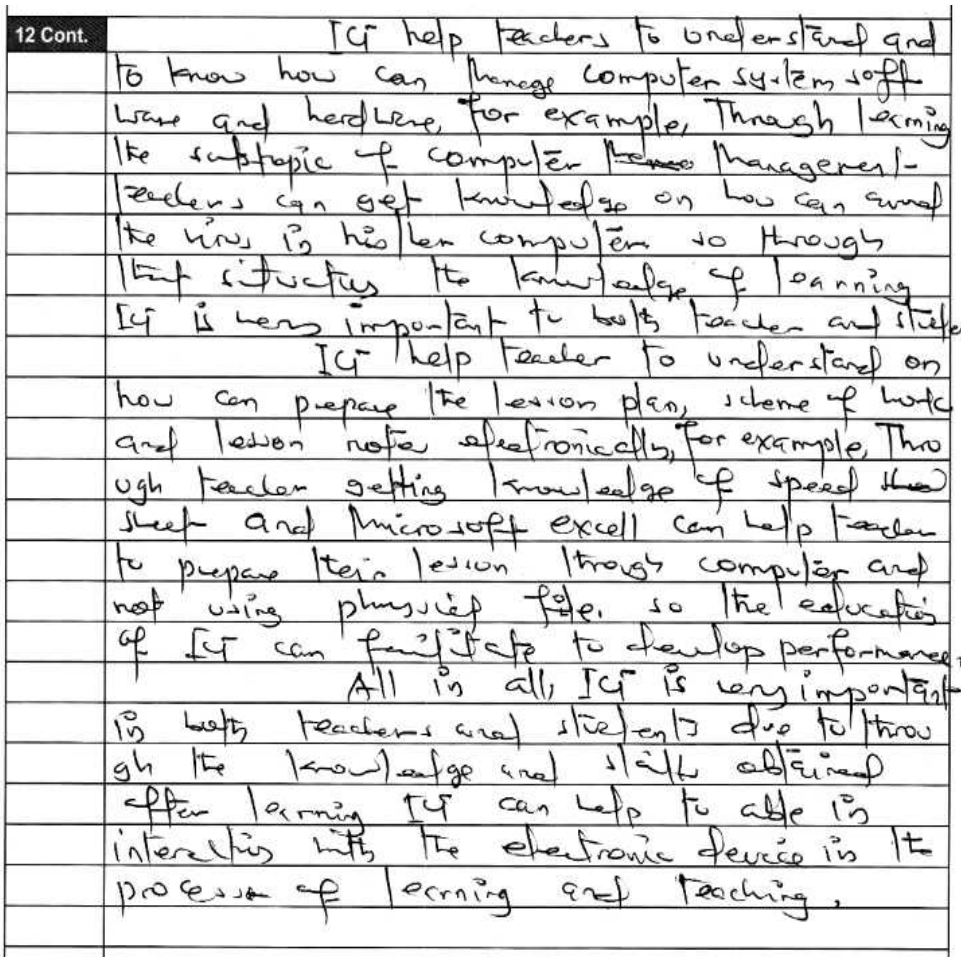
Information and communication Technology (ICT) is refer to the all electronic devices that allow people to communicate, to share information through electronic devices. for example computer, Televisions, Smart phone and overhead projector. Information and communication Technology (ICT) is very important is all sectors, that can facilitate to simplify work.

The following are the benefits of information and communication Technology to the teacher.

ICT helps teacher to simplify learning and teaching process, for example, computer can be used by a teachers to use on the teaching method is order to facilitate the learning and learning process, so through this virtual teacher, benefit through learning Information and communication Technology.

ICT help teachers to get skills and knowledge on using electronic media, for example, Through learning Information and communication Technology to the teacher, can get skills to use electronical model is teaching and learning process is different situation, also can enhance teacher to be creativity on selection of selected teaching and learning aid, to be used is specific topic.

ICT help teacher to understand on operating the sys system soft ware for typing document, for example, Through teacher learn the concept of system soft ware can help to get skills on how can type the different office document through electronic devices.

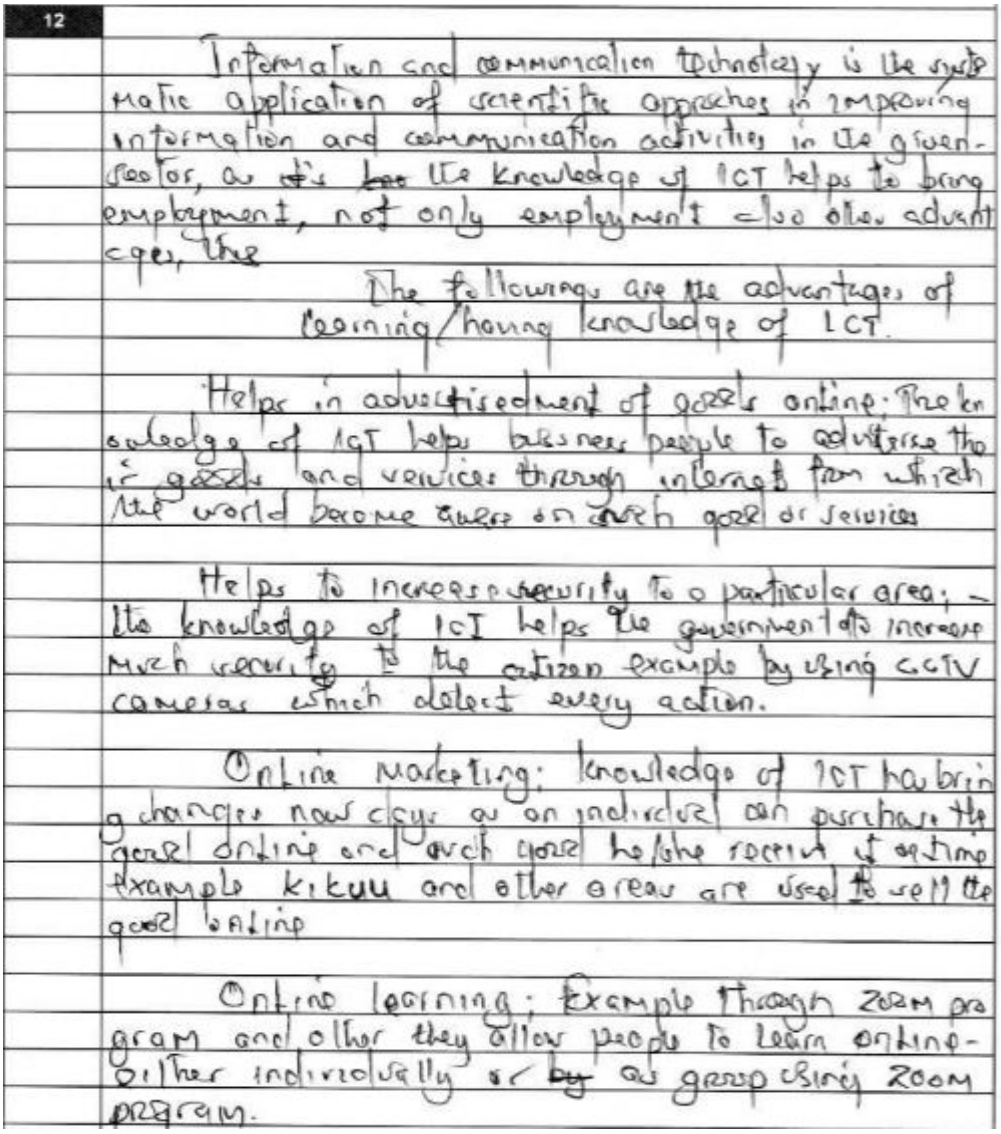


Extract 12.1: A sample of an incorrect response to question 12

In extract 12.1, a candidate explained the importance of ICT to teachers instead of employment opportunities it can offer.

On the other hand, 521 (30.8%) candidates scored 6 to 10 marks. These candidates managed to explain at least two points correctly, other candidates mixed the importance of ICT in teaching and learning process and employment opportunities it can offer to teachers for instance one of the candidates wrote the following responses; *Opening internet café, ability to control the network, presence of job creation, availability of knowledge and skills, training illiterate people*.

Detailed statistics showed that, 15 (0.9%) candidates scored 10.5 to 15 marks. These candidates understood the question and had adequate knowledge on the importance of learning ICT as a means to enable creation of employment to teachers. Some of the candidates wrote; *a teacher can use ICT knowledge to teach those in need*, *a teacher can open stationary services*, *you can make on line business, a teacher can open online kiosk for searching materials, seeking for jobs and checking examination results*; Extract 12.2, shows a correct response from one of the candidates.


12

Information and communication technology is the syste
matic application of scientific approaches in improving
information and communication activities in the given-
sector, as it's the knowledge of ICT helps to bring
employment, not only employment also other advant
ages, they

The followings are the advantages of
learning/having knowledge of ICT.

Helps in advertisement of goods online: The kn
owledge of ICT helps business people to advertise the
ir goods and services through internets from which
the world become aware on each good or services

Helps to increase security to a particular area; -
the knowledge of ICT helps the government to increase
much security to the citizen example by using CCTV
cameras which detect every action.

Online Marketing: knowledge of ICT has brin
g changes now days as an individual can purchase the
goods online and each goods he/she receive it on time
example kikuu and other areas are used to sell the
goods online

Online learning: Example through ZOOM pro
gram and other they allow people to learn online-
either individually or by as group using ZOOM
program.

Extract 12.2: A sample of a correct response to question 12

2.2.3 Question 13: Multimedia

In this question, the candidates were asked to analyze five features that will attract a secretary to use a new multimedia device for typing activities. The question intended to examine students' knowledge on basic features of multimedia. A total of 1,733 (100%) candidates attempted this question, of which 492 (28.4%) candidates scored 0 to 5.5 marks 1,047(57.6%) candidates scored 6.0 to 10 marks, and 194 (11.2%) candidates scored 10.5 to 15 marks. The data showed that the candidates' performance in this question was average, since 68.8 per cent scored 6 to 15 marks. Figure 13 illustrates candidates' performance in this question.

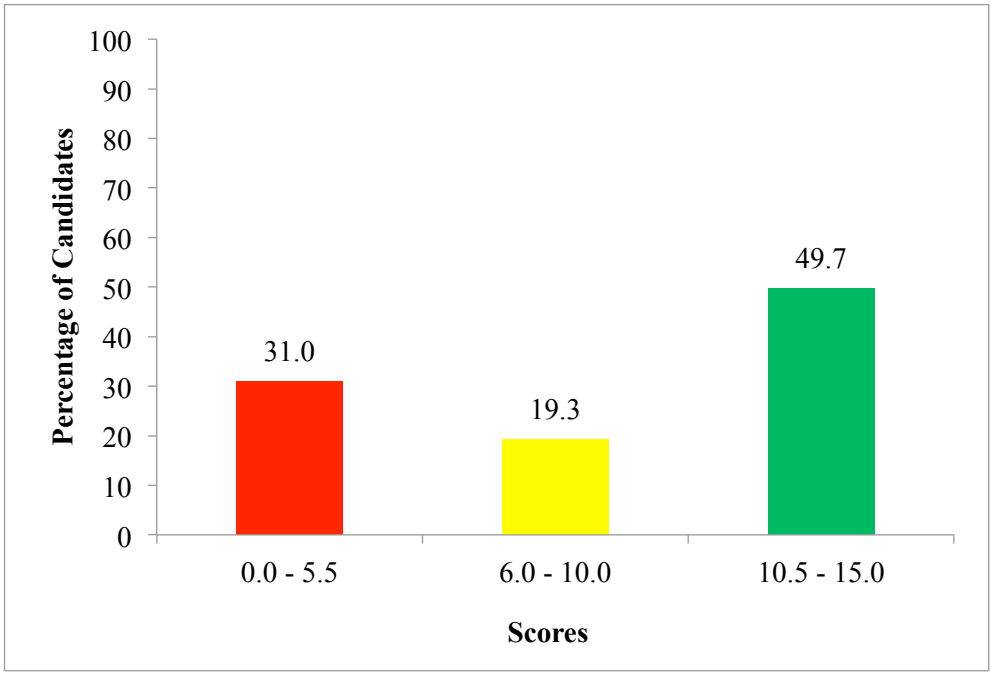
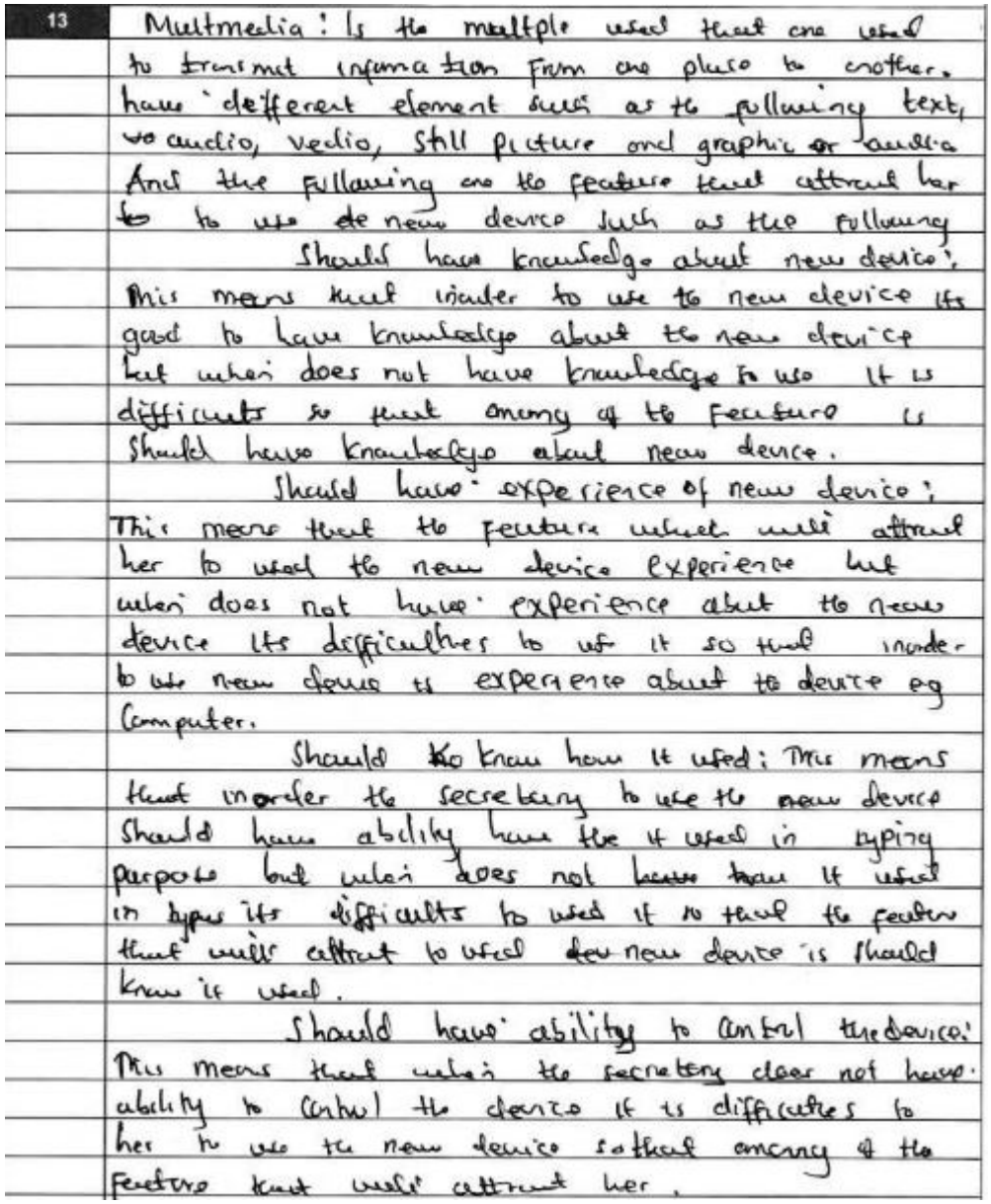
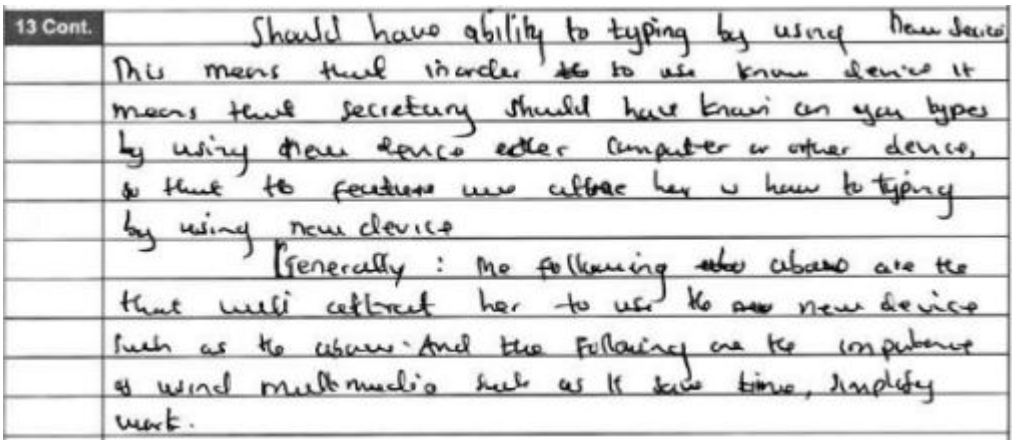


Figure 13: *Candidates' Performance in Question 13*

Thorough analysis showed that 492 (28.4%) candidates scored 0 to 5 marks. These candidates lacked adequate knowledge of the features of multimedia device. Some candidates responded by giving a criteria for one to use multimedia device. Other candidates explained activities that are to be performed by the secretary such as; *a secretary must know how to type, must know how to print and scan the document, must know how to add documents to storage, must use correctly the external devices*. It was also observed that some candidates under this category mixed the features of multimedia and physical features of computers such as; *text, animation, it should be large, it*

should be portable, it should be heavy. Extract 13.1 shows incorrect response from this question.



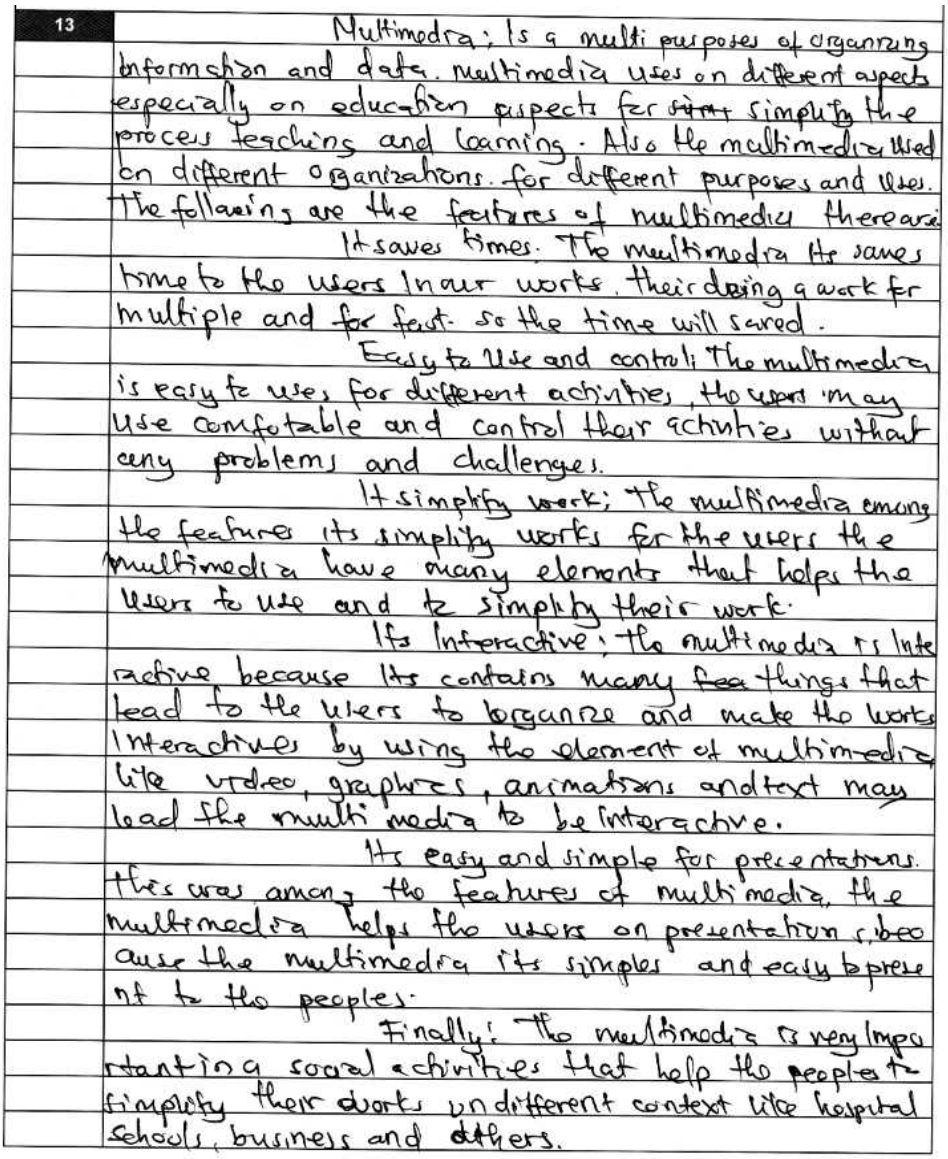


Extract 13.1: A sample of an incorrect response to question 13.

In extract 13.1, a candidate explained qualities of a secretary instead of writing attracting features for multimedia devices.

In addition 1,047 (57.6%) candidates scored 6 to 10 marks. In this group students understood the question but they lacked sufficient knowledge on influencing features for the use of multimedia devices. Candidates in this group were able to write half of the points correctly, for example one of them wrote; *it has high processing speed as well as security*, *good memory and storage*, it *is easy to install, helps to cover hard disc.* so they ended up getting half.

Moreover the analysis shows that, 194 (11.2%) candidates scored 10.5 to 15 marks. This group understood the question and had adequate knowledge on features of multimedia device. Some candidates wrote on; *ability of storage and memory of the device*, others wrote on *high processing power of the device*, *availability of software tools which helps to handle*, *design and develop application.* Extract 13.2 shows the correct response in this question.


13

Multimedia; Is a multi purposes of organizing information and data. multimedia uses on different aspects especially on education aspects for ~~first~~ simplify the process teaching and learning. Also the multimedia used on different organizations. for different purposes and uses. The following are the features of multimedia there are

It saves times. The multimedia its saves time to the users In our works. their doing a work for multiple and for fast. so the time will saved.

Easy to Use and control; The multimedia is easy to uses for different activities, the users may use comfotable and control their activities without eany problems and challenges.

It simplify work; The multimedia among the features its simplify works for the users the multimedia have many elements that helps the users to use and to simplify their work.

Its Interactive; The multimedia is Interactive because its contains many ~~fea~~ things that lead to the users to organize and make the works Interactives by using the element of multimedia like video, graphics, animations and text may lead the multimedia to be interactive.

Its easy and simple for presentations. this was among the features of multimedia, the multimedia helps the users on presentations, because the multimedia its simples and easy to present to the peoples.

Finally; The multimedia is very Important in a social activities that help the peoples to simplify their works in different context like hospital schools, business and ~~d~~thers.

Extract 13: 2 A sample of a correct response to question 13

2.2.4 Question 14: Generic software application

The question required candidates to validate the fields where database management system is applied. The question intended to examine students understanding on the fields where database management system is applied.

A total of 1,733 (100%) of the candidates attempted this question, of which 824 (49.7%) candidates scored 10.5 to 15 marks, 372 (19.3%) candidates scored 6.0 to 10 marks and 537 (31%) candidates scored 0 to 5.5 marks. The data shows that the candidates' performance in this question was good,

since 69 per cent scored 6 to 15 marks. Figure 14 illustrates candidates' performance in this question.

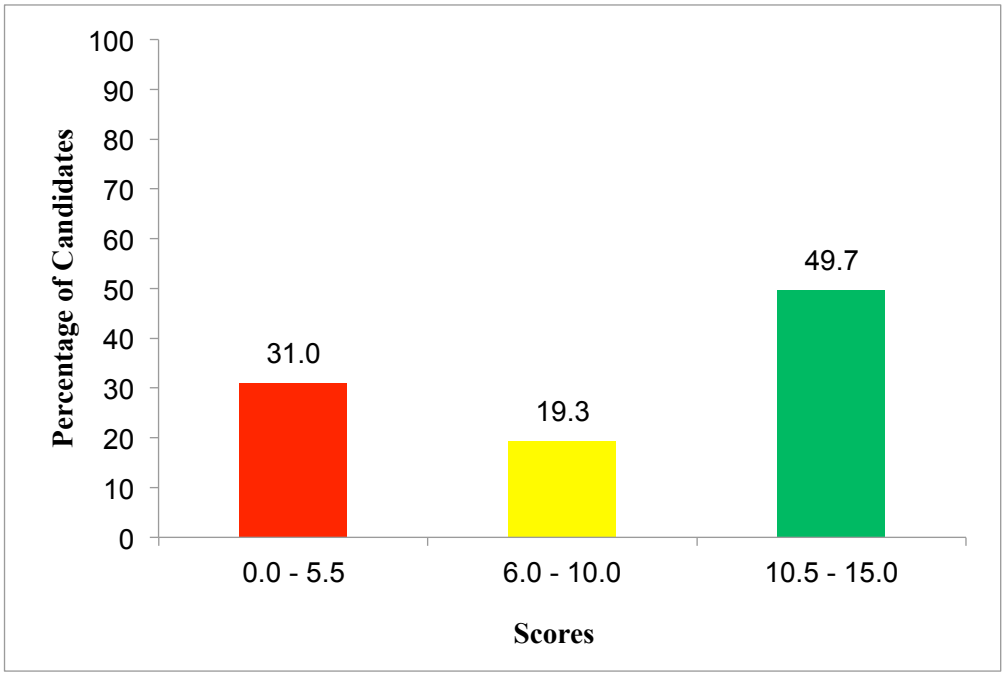
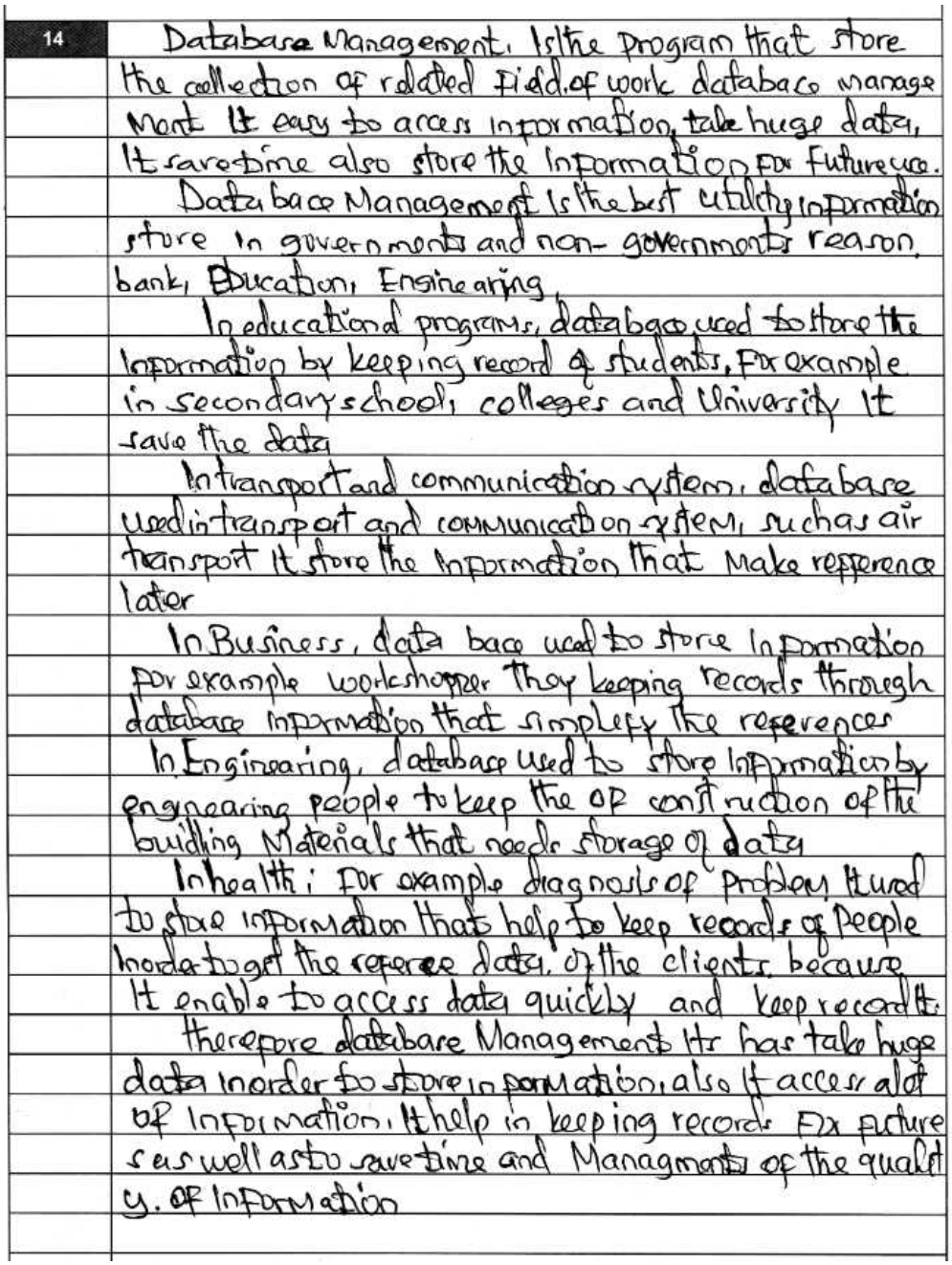


Figure 14: *Candidates' Performance in Question 14*

Statistics shows that 824 (49.7%) candidates scored 6 to 10 marks. This group understood the question and they had plenty knowledge on how database saves as a best utility information storage in various fields. They were able to identify fields where database is applied, such as; *in schools, in hospitals, in manufacturing industry, in railways reservations and in air ticketing.* Their responses made them to get good marks. Extract 14.1 shows a sample of correct response from a candidate.


14

Database Management. Is the program that store the collection of related Field of work database manage work It easy to access information, take huge data, It save time also store the information for future use.

Database Management Is the best utility information store in governments and non- governments reason. bank, Education, Engineering,

In educational programs, database used to store the information by keeping record of students, For example in secondary school, colleges and University It save the data

In transport and communication system, database used in transport and communication system, such as air transport It store the information that Make repperence later

In Business, data base used to store information for example workshopper they keeping records through database information that simpleff the repperences

In Engineering, database used to store information by engineering people to keep the of construction of the building Materials that needs storage of data

In health; For example diagnosis of problem, It used to store information that help to keep records of people inorder to get the reperee data, of the clients because It enable to access data quickly and keep record It.

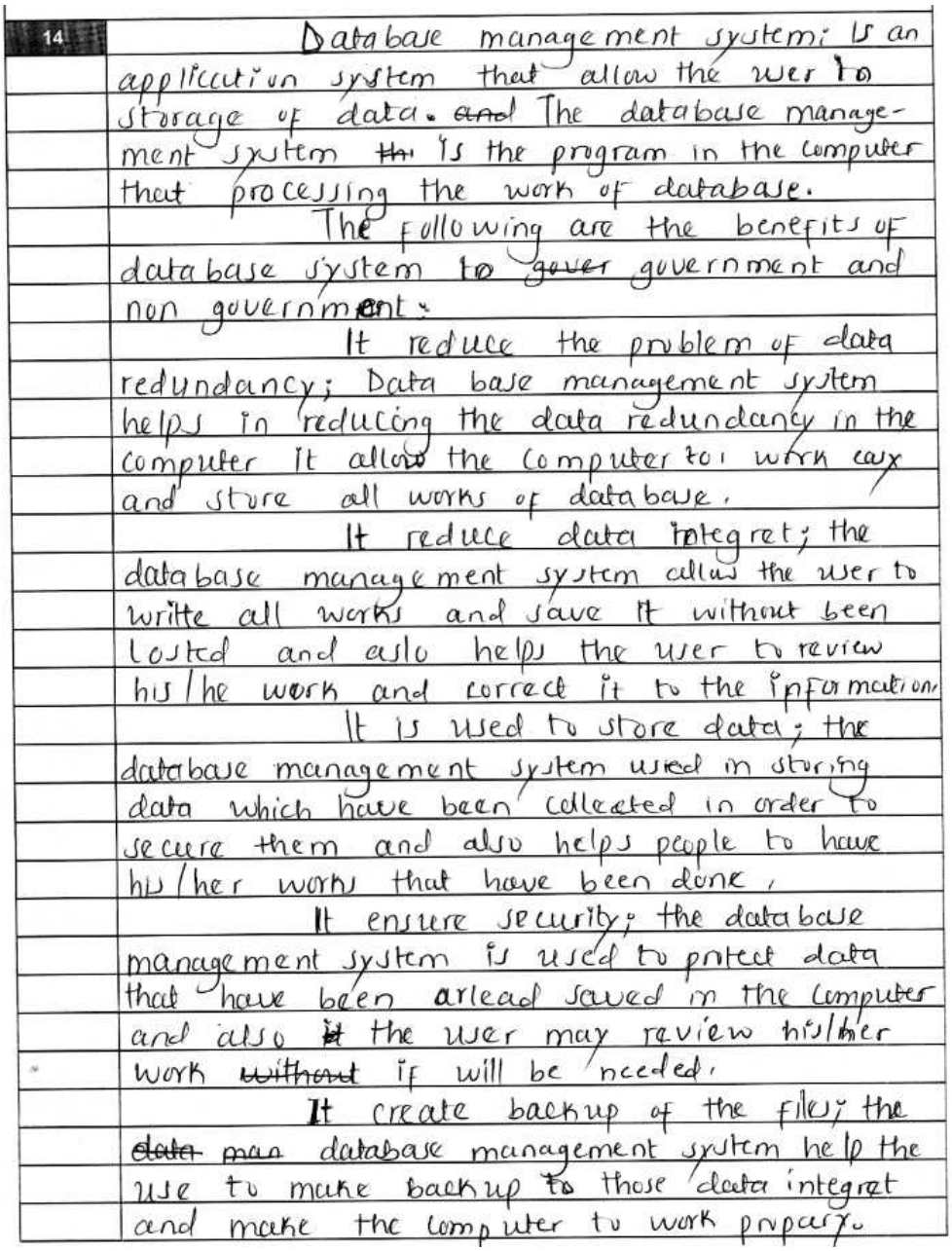
therefore database Management Itr has take huge data inorder to store information, also It access alot of Information. It help in keeping records For future seas well as to save time and Managments of the qualit y. of Information

Extract 14.1: A sample of a correct response in question 14

On the other hand, 372 (19.3%) scored 6 to 10 marks. This group understood the question but had limited knowledge to identify the fields where database management system can be applied. Some mentioned only two fields correctly out of five required fields with poor explanations such as: *database*

can be used as a GPS to give direction to people, *it can be used at home to keep budget of the family, it is used by hospitals for records, it is used to Capture documents, used in schools for student's reports.* These responses portray that candidates had adequate knowledge in this area hence scored half marks.

However, 537 (31%) scored 0 to 5 marks. These candidates did not understand the question thus they failed to portray various fields where database management system can be used to store information. Some candidates in this group failed to differentiate the importance of database and the fields where it can be applied. Others mixed the correct and incorrect fields where database management system can be applied as they wrote; *database helps to reduce data redundancy, data storage in schools, ensure data security and file back up in hospitals*. *Data base makes sharing of data easy, helps to simply teaching and learning.* Extract 14.2 shows incorrect response from one of the candidates.


14

Database management system: Is an application system that allow the user to storage of data. ~~and~~ The database management system ~~th~~ is the program in the computer that processing the work of database.

The following are the benefits of database system to ~~gover~~ government and non government:

It reduce the problem of data redundancy; Data base management system helps in reducing the data redundancy in the computer it allow the computer to work easy and store all works of database.

It reduce data integret; the database management system allow the user to write all works and save it without been losted and aslo helps the user to review his/he work and correct it to the information.

It is used to store data; the database management system used in storing data which have been collected in order to secure them and also helps people to have his/her works that have been done.

It ensure security; the database management system is used to protect data that have been arlead saved in the computer and also ~~it~~ the user may review his/her work ~~without~~ if will be needed.

It create backup of the files; the ~~data~~ ~~man~~ database management system help the use to make backup to those data integret and make the computer to work properly.

Extract 14.2: A sample of an incorrect response from a candidate

In extract 14.2, the candidate had misconception on a question and wrote on importance of database and not the field where database management system can be applied.

3.0 CANDIDATES PERFORMANCE IN EACH TOPIC

The Information and Communication Technology examination for Diploma in Secondary Education was set from (5) topics. The analysis of the candidates' responses shows that, the performance was good in the two topics which were *multimedia* (90.1%), and *Fundamentals of Information and Communication Technology (75%).* The good performance was a result of correct interpretation of the questions and candidates' mastery of the content and good practical skills.

Furthermore, the candidates had average performance in the topics of *Social Economic and Cultural Aspects of ICT (*63.25%) and *Generic Software Application* (43.1%). This performance was an outcome of insufficient understanding on basic computer-related concepts.

However, the candidates performed poorly in the topics of *Computer basic and Network (38.8%)*. This is because the candidates lacked partial knowledge on the topics. The performance of the candidates in each topic is shown in the Appendix.

4.0 CONCLUSSION

The overall performance of the candidates in the Information and Communication Technology examination in 2023 was good. The analysis shows that the candidates' performance was good in questions 3, 6, 9 and 13 while it was average in questions 1, 5, 8, 11, 12 and 14. On the other hand, it was poor in questions 2, 4, 7 and 10.

Further analysis shows that the good performance was on two (2) topics, average on two (2) topics and poor on one (1) topic. The reasons for the good performance include the candidate's adequate knowledge and skills in most of the examined areas.

The analysis of the candidates' responses in each topic indicates that, candidates faced some difficulties in answering questions from the topic of *Computer basics and Networks.* The poor performance was attributed to candidates' partial knowledge and understanding on the topics, asked concepts, and poor interpretation of questions.

5.0 RECOMMENDATIONS

In order to improve the candidates' performance in Information and Communication Technology examinations, the following should be done:

(a) Tutors should use competence-based questions during monthly test, mid - terms or annual examinations. They should keep their students used to answer competence-based questions to familiarize them with final examination (DSEE). Teachers should reduce questions which encourage memorization.

(b) ICT tutors should adhere to some teaching and learning strategies suggested in the new ICT syllabus so as to make learners fulfill their learning responsibilities.

(c) Practical should be emphasized by giving room for least performed topics which require leaners to do practical work, the real doing on the topic of *Computer basics and Networks*.

Appendix

SUMMARY OF PEFORMANCE IN INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SUBJECT

No.	Topic	Question number	Performance in each Question (%)	Performance in each topic (%)	Remarks
1	Multimedia	3	99.6	90.1	Good
		6	99.1		
		13	71.6		
2	Fundamentals of information and communication Technology.	9	75.0	75.0	Good
3	Social-economic and cultural aspects of ICT	5	94.9	63.25	Average
		12	31.6		
4.	Generic software application	1	5.1	43.1	Average
		8	09		
		11	97.5		
		14	69.0		
5	Computer basics and Networks	2	91.4	38.8	Poor
		4	0.5		
		7	1		
		10	62.2		