Aga Khan University Examination Board

Notes from E-Marking Centre on SSC-I Computer Science Examination May 2018

Introduction:

This document has been produced for the teachers and candidates of Secondary School Certificate (SSC-I) Computer Science. It contains comments on candidates' responses to the 2018 SSC-I Examination, indicating the quality of the responses and highlighting their relative strengths and weaknesses.

E-Marking Notes:

This includes overall comments on candidates' performance on every question and *some* specific examples of candidates' responses which support the mentioned comments. Please note that the descriptive comments represent an overall perception of the better and weaker responses as gathered from the e-marking session. However, the candidates' responses shared in this document represent some specific example(s) of the mentioned comments.

Teachers and candidates should be aware that examiners may ask questions that address the Student Learning Outcomes (SLOs) in a manner that requires candidates to respond by integrating knowledge, understanding and application skills they have developed during the course of study. Candidates are advised to read and comprehend each question carefully before writing the response to fulfill the demand of the question.

Candidates need to be aware that the marks allocated to the questions are related to the answer space provided on the examination paper as a guide to the length of the required response. A longer response will not in itself lead to higher marks. Candidates need to be familiar with the command words in the SLOs which contain terms commonly used in examination questions. However, candidates should also be aware that not all questions will start with or contain one of the command words. Words such as 'how', 'why' or 'what' may also be used.

General Comments:

In general, questions related to types of computer, CPU components, input devices, types of software, MS PowerPoint and MS Word were well attempted. However, questions based on evolution of computers, memory unit conversion, Windows start menu, octal to decimal number system conversion, user interfaces and disc operating system (DOS) were generally not well attempted.

Detailed Comments:

Constructed Response Questions (CRQs)

Question 1:

Names of some computing devices that were invented during the evolution of computer are given below.

- ENIAC
- UNIVAC
- Mark-1
- Abacus
- Difference engine
- Punch card tabulator
- Analytical engine
- Pascal's Pascaline calculator

Choose appropriate name from the list inside the box and write it with corresponding statement about a computing device.

(**Note:** Only one name can be used for one statement.)

i. _____ was steam powered, fully automatic and could print the results as well.

ii. _____ works on decimal arithmetic rather than binary arithmetic.

iii. _____ was a general purpose, fully program-controlled and automatic mechanical digital computer.

iv. _____ had a system of gears. One-tooth gear of this machine engages tooth with a ten-tooth gear once every time it revolves.

v. _____ processes data in numerical form using digital circuits.

(**Note:** Most of the responses for this question performed below average in this question.)

Better responses showed good understanding of evolution of computers and wrote correct terms to complete the given statements as shown in the given example.

Example:

i. Difference engine was steam powered, fully automatic and could print the results as well.

ii. ENIAC works on decimal arithmetic rather than binary arithmetic.

iii. Analytical engine was a general purpose, fully program-controlled and automatic mechanical digital computer.

iv. Pascal's Pascaline calculator had a system of gears. One-tooth gear of this machine engages tooth with a ten-tooth gear once every time it revolves.

v. Mark -1 processes data in numerical form using digital circuits.

Weaker responses showed lack of understanding about evolution of computers despite the fact that question was from first student learning outcome (SLO) of the syllabus. Most of the candidates were able to identify **difference engine** and/ or **Pascal's Pascaline calculator**. However, candidates tried to guess the answer and randomly wrote the names of computing devices for rest of the statements

Example:

i. Punch card tabulator was steam powered, fully automatic and could print the results as well.

ii. Abacus works on decimal arithmetic rather than binary arithmetic.

iii. Analytical Engine was a general purpose, fully program-controlled and automatic mechanical digital computer.

iv. Pascal's Pascaline calculator had a system of gears. One-tooth gear of this machine engages tooth with a ten-tooth gear once every time it revolves.

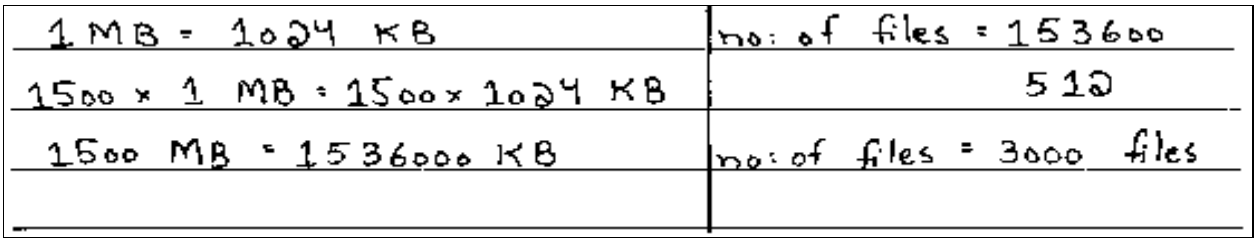
v. ENIAC processes data in numerical form using digital circuits.

Question 2a:

How many image files, of size 512 kilobytes each, can be stored on 1500 megabytes of a DVD? Show your working.

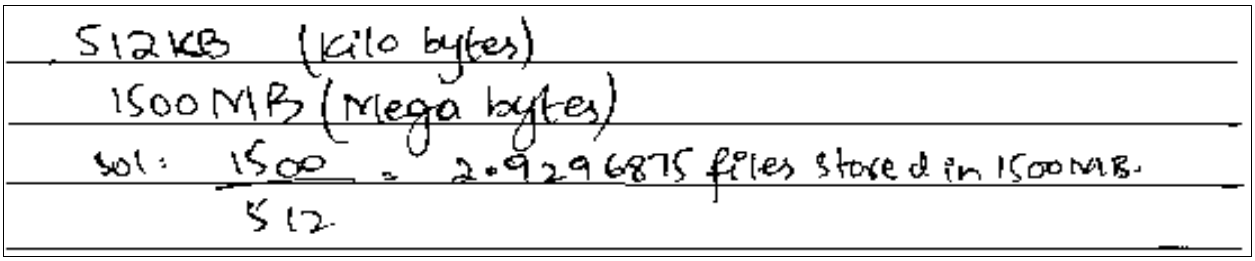
Better responses were able to perform the conversion between kilobytes and megabytes correctly. They also applied correct arithmetic operation, i.e. division or multiplication, to get the required answer.

Example:



Weaker responses demonstrated poor conceptual knowledge about the conversion between kilobytes and megabytes and calculated the number of images without making the memory unit of given values same. A few of these responses were able to correctly calculate number of images per megabyte, i.e. 2 images, but failed to perform the next step to get the answer 3000 images.

Example:



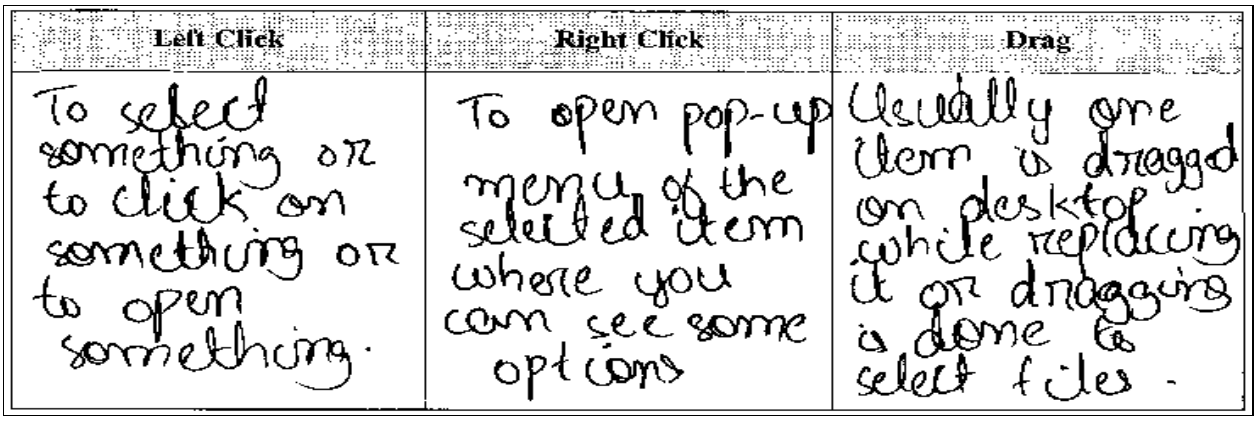
Question 2b:

THREE types of events are performed by a mouse. Describe the purpose of these events.

Left Click	Right Click	Drag

Better responses managed to distinguish between the left click, right click and drag events and did not mix these concepts. For example, left click is used to select an icon, folder and file/ right click is used to view the properties of an object such as file, folder, etc./ drag event occurs when the left mouse button is kept pressed to drag and drop an object.

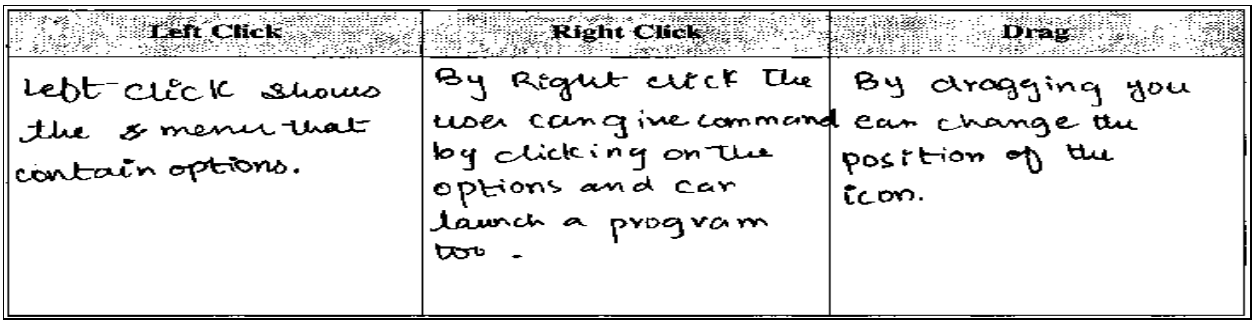
Example:



Left Click	Right Click	Drag
To select something or to click on something or to open something.	To open pop-up menu of the selected item where you can see some options	Usually one item is dragged on desktop while replacing it or dragging is done to select files.

Weaker responses depicted confusion between left click event and right click event and wrote the description of left click event under the heading of right click event and vice versa. Moreover, few of these responses wrote the description of scrolling instead of dragging.

Example:



Left Click	Right Click	Drag
Left click shows the a menu that contain options.	By Right click the user can give command by clicking on the options and can launch a program too.	By dragging you can change the position of the icon.

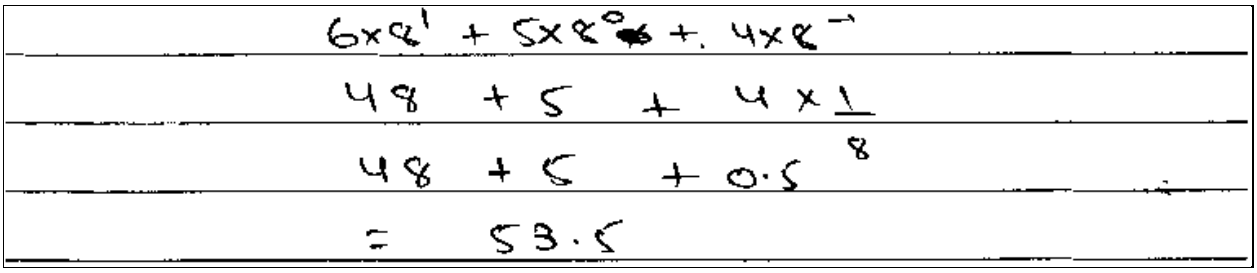
Question 3a:

Convert the given octal number into decimal number. Show your working.

$(65.4)_8$

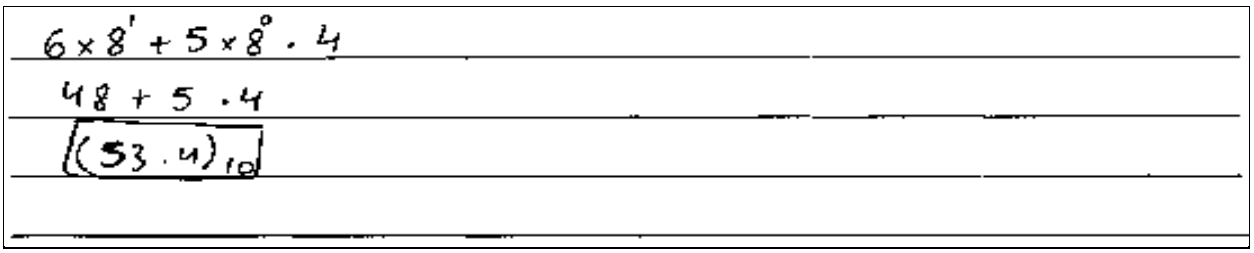
Better responses demonstrated good understanding of converting octal number into decimal number while considering the decimal point as well, i.e. starting from 8^0 on the left side of decimal point and 8^{-1} on the right side of decimal point. Some of these responses removed decimal point by dividing the given octal number by 10 and then performed conversion to decimal and finally divided the values to get the answer. As per the requirement of the question, these responses showed the working required for conversion from octal to decimal number system.

Example:



Weaker responses were not able to convert octal number into decimal number correctly. The glaring mistake in these responses was inability to understand the importance of decimal point, i.e. starting from 8^0 on the right side of decimal point rather than 8^{-1} or not converting the right side of decimal point that causes incorrect answer on the right side of decimal point.

Example:

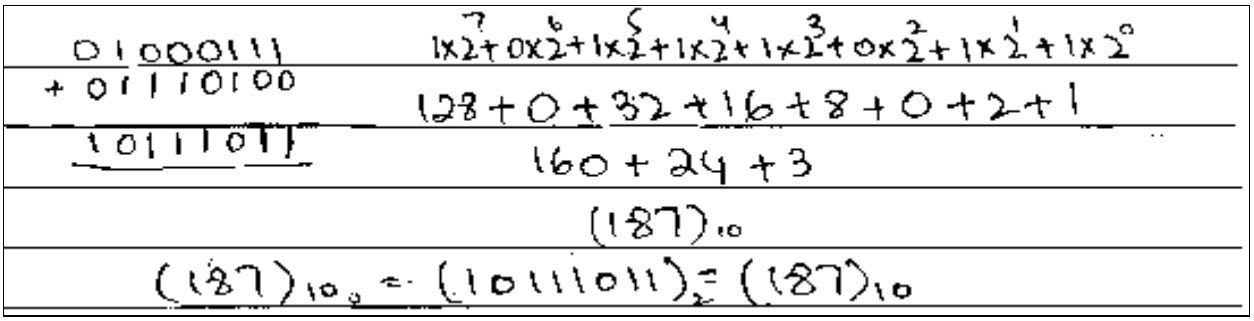


Question 3b:

Show that binary addition of two numbers, $(01000111)_2$ and $(01110100)_2$, gives a result which is equal to 187 in decimal number system.

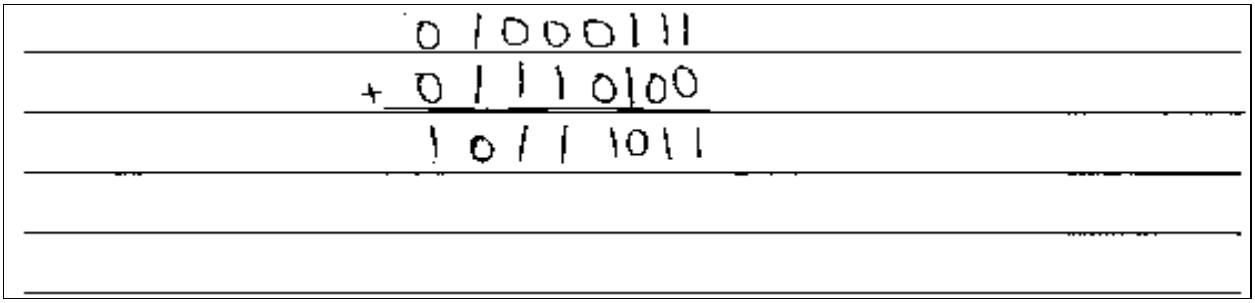
Better responses correctly performed the binary addition to get the binary value $(10111011)_2$. In order to verify whether this binary value is equal to 187 or not, these responses used two methods. In the first method, binary to decimal conversion was performed on both binary numbers and then these decimal numbers were added to get the sum 187. In the second method, 187 was converted into binary number which is $(10111011)_2$ and it was shown that the sum of the given binary numbers and the binary equivalent of 187 are the same.

Example:



Weaker responses were mostly able to add the binary numbers given in question correctly but they did not show that sum of binary numbers is equal to $(187)_{10}$.

Example:



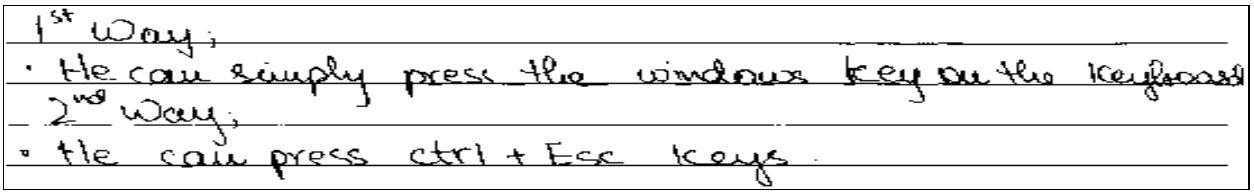
Question 4a:

Asher wants to launch the start menu on his computer system which has Windows operating system installed but the mouse connected to his computer system is not working.

Mention any TWO ways in which Asher could launch the start menu without using the mouse.

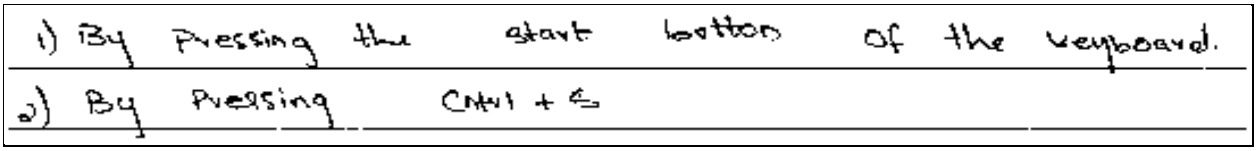
Better responses mentioned a variety of ways to launch the start button without using mouse. For example, using Windows key/ CTRL + ESC shortcut/ trackball/ touch pad on keyboard/ speech recognition/ virtual assistant/ navigation keys.

Example:



Weaker responses were not able to write the correct name of Windows key and mentioned the incorrect ways to launch start menu. For example, click the start button on keyboard/ use the arrow keys/ use the function keys/ use Ctrl + S keyboard shortcut.

Example:



Question 4b:

Given is a list of change case options available in MS Word.

Change Case Options

- Sentence case
- Lowercase
- Uppercase
- Capitalize each word
- Toggle case

The given table shows words before and after the change case option is applied on them. Select appropriate change case option for each word from the given list and write it in the third column of the table.

Before Applying Change Case	After Applying Change Case	Change Case Option Used
CompuTer	cOMPUtER	
FLOPPY	Floppy	

Better responses demonstrated the good applied knowledge of change case option in MS Word and applied correct change case options on the words given in the question.

Example:

Before Applying Change Case	After Applying Change Case	Change Case Option Used
CompuTer	cOMPUtER	Toggle case
FLOPPY	Floppy	Sentence case

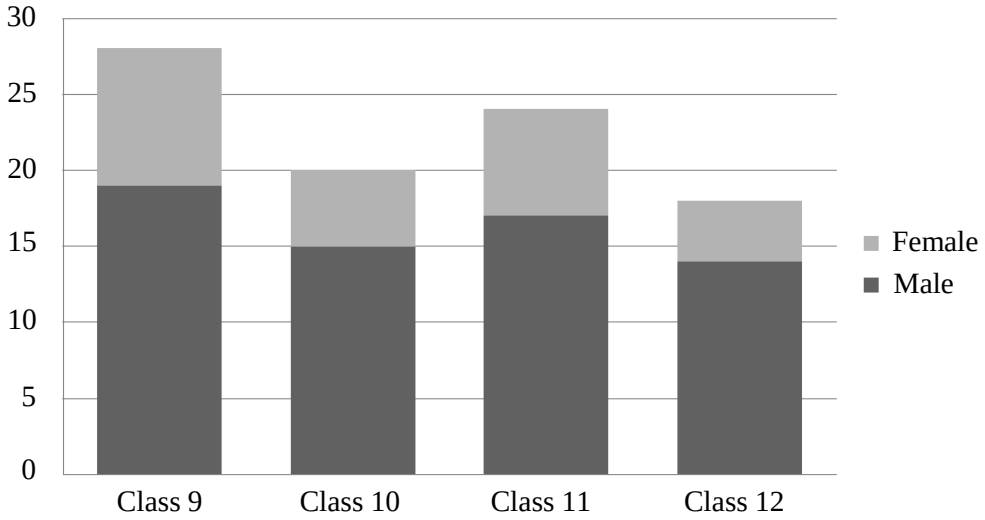
Weaker responses mostly selected the change case options from the given list that matched the appearance of words, i.e. **uppercase** and **capitalize each word** instead of **toggle case** on the word CompuTer and **lowercase** and **toggle case** instead of **capitalize each word** and **sentence case** on the word FLOPPY. Likewise, few of these responses wrote computer and floppy in upper or lower case instead of writing the name of change case option to be used.

Example:

Before Applying Change Case	After Applying Change Case	Change Case Option Used
CompuTer	cOMPUtER	Capitalize each word
FLOPPY	Floppy	Toggle case

Question 4c:

To insert any chart in MS PowerPoint, we enter data in the MS Excel file that should be depicted in the chart.



Complete the given MS Excel table by filling the shaded cells with reference to the given chart.

	19	9
	15	5
	17	7
	14	4

Better responses depicted that candidates practiced to add chart in PowerPoint file and wrote male and female in correct order in the shaded cells at the top of the MS Excel table and class 9, class 10, class 11 and class 12 in correct order in the shaded cells at the left of the MS Excel table given in the question.

Example:

	Male	Female
Class 9	19	9
Class 10	15	5
Class 11	17	7
Class 12	14	4

Weaker responses depicted lack of practice of the concept tested in this question and completed the MS Excel table with common mistakes. For example, swapped the order of male and female/ wrote the total number of male and female in each class in the shaded cells at the left of the table/ wrote the difference between male and female instead of number of females only.

Example:

No. of male + No. of fe.	No. of Male	No. of female
19+9 = 28	19	9
15+5 = 20	15	5
17+7 = 24	17	7
14+4 = 18	14	4

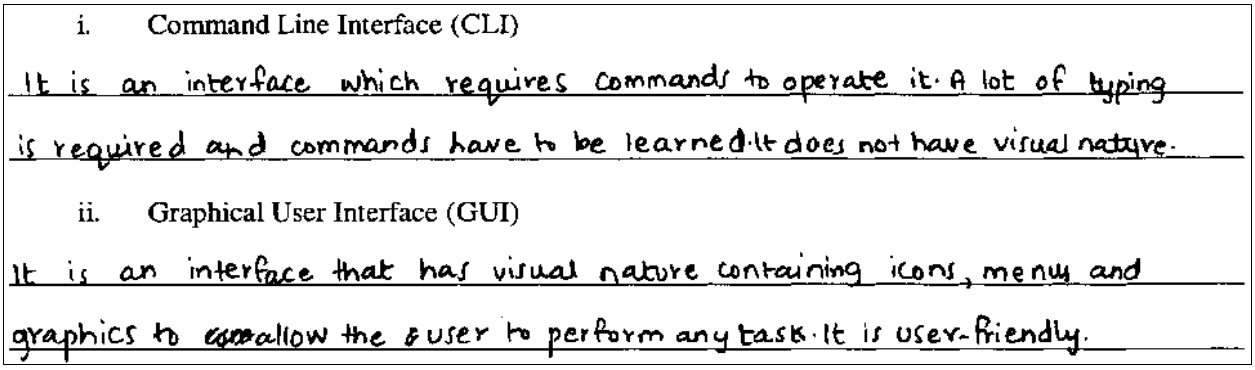
Question 5a:

Define the following types of user interface:

i. Command Line Interface (CLI)
ii. Graphical User Interface (GUI)

Better responses wrote to the point correct definition of command line interface (CLI) and graphical user interface (GUI), such as, user types commands to perform any operation in CLI and in GUI user uses mouse to interact via icons, menus, windows and pointers.

Example:


i. Command Line Interface (CLI)

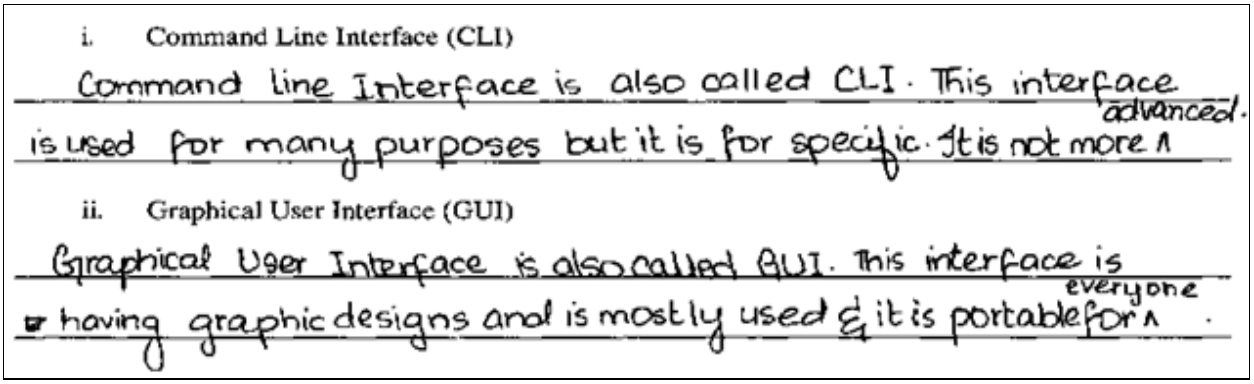
It is an interface which requires commands to operate it. A lot of typing is required and commands have to be learned. It does not have visual nature.

ii. Graphical User Interface (GUI)

It is an interface that has visual nature containing icons, menus and graphics to allow the user to perform any task. It is user-friendly.

Weaker responses mostly wrote the definition of CLI but they did not define graphical user interface. For example, GUI has graphics/ GUI allows user to perform any function without typing commands/ GUI converts images in commands and it does everything graphically. Likewise, few of these responses depicted that candidates were confused between definitions and features of CLI and GUI and wrote features of these two interfaces rather than defining them, such as, GUI is easy to use/ CLI is difficult to use/ GUI occupies more memory/ CLI occupies less memory/ GUI is multitasking/ CLI is single tasking.

Example:


i. Command Line Interface (CLI)

Command line Interface is also called CLI. This interface is used for many purposes but it is for specific. It is not more advanced.

ii. Graphical User Interface (GUI)

Graphical User Interface is also called GUI. This interface is having graphic designs and is mostly used & it is portable for everyone.

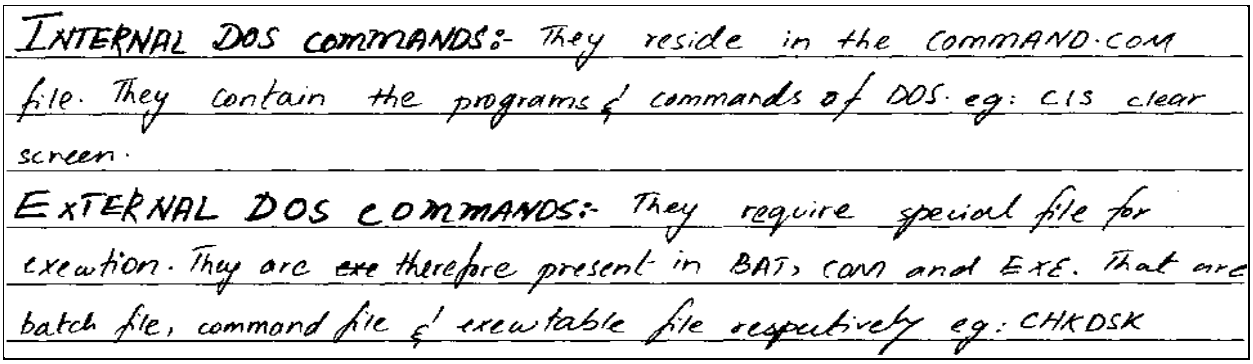
Question 5b:

Define 'internal' and 'external' commands in DOS and give an example of any ONE of these.

(**Note:** There were very few better responses for the application level question from the topic of DOS for the last two years but the number of better responses was more for the knowledge level question from DOS for this year.)

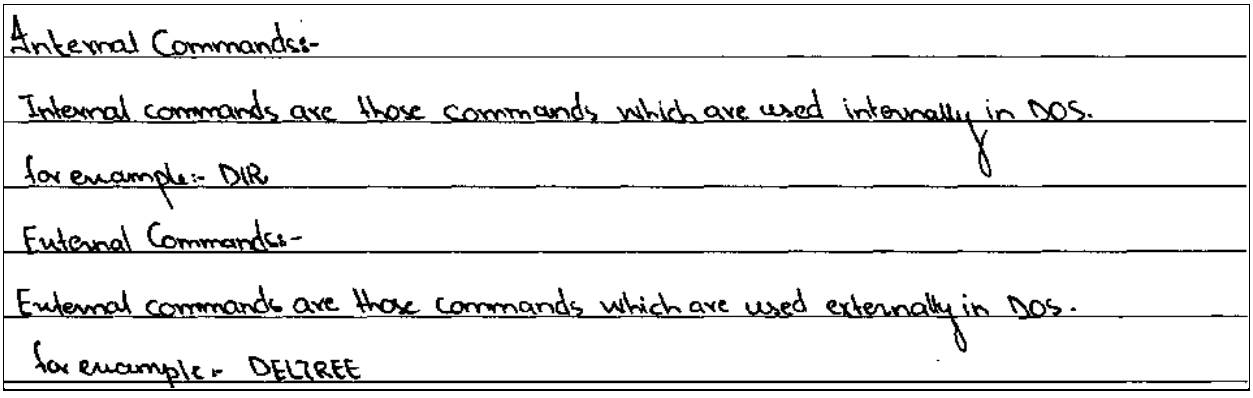
Better responses depicted that candidates were able to define internal and external commands in DOS with the necessary keywords. Moreover, these responses wrote correct commands in examples.

Example:


INTERNAL DOS COMMANDS:- They reside in the COMMAND.COM file. They contain the programs & commands of DOS. eg: CLS clear screen.
EXTERNAL DOS COMMANDS:- They require special file for execution. They are ~~exe~~ therefore present in BAT, COM and EXE. That are batch file, command file & executable file respectively eg: CHKDSK

Weaker responses mostly wrote the example of internal or external DOS commands correctly but did not define these two types of commands correctly such as internal DOS commands are used internally/ internal DOS commands are used to change the internal information of DOS/ external DOS commands are used to change the external information of DOS/ external DOS commands are used externally etc. Likewise, a few of the answers to this question swapped the definitions of internal and external commands.

Example:


Internal Commands:-
Internal commands are those commands which are used internally in DOS.
for example:- DIR
External Commands:-
External commands are those commands which are used externally in DOS.
for example:- DELTREE

Extended Response Questions (ERQs)

The following questions offered a choice between part **a** and **b**.

Question 6a:

i. Differentiate among supercomputers, minicomputers and microcomputers on the basis of their size, computation speed, cost and use.

	Supercomputers	**Minicomputers**	**Microcomputers**
Size			
Speed			
Cost			
Use			

ii. Write any THREE advantages of using integrated circuits (ICs) over transistors in third generation of computers.

(**Note:** Candidates attempted both parts of this question almost equally but their performance was slightly better in part **a** than part **b**. This shows their interest in different types of computers and major technologies used in different generations of computers.)

Better responses differentiated among supercomputers, minicomputers and microcomputers on the basis of given factors correctly. These responses differentiated the given three categories of computers by relating them with each other. For example, supercomputers are largest in size, minicomputers are larger than microcomputers but smaller than supercomputers and microcomputers are smaller than supercomputers and minicomputers in size. Likewise, they compared other factors of these three categories of computers in the same manner.

Moreover, these responses wrote correct advantages of using ICs over transistors in third generation of computers such as ICs are smaller in size than transistors, ICs consume less energy than transistors, ICs produce lesser heat than transistors, ICs had more processing power than transistors, etc.

Example (i):

	Supercomputers	Minicomputers	Microcomputers
Size	The size of super computer is larger than mini and micro computer	Mini computer are larger in size that micro computer.	Micro computer size is smallest among super and mini computer.
Speed	Super computers have very high speed than mini or micro computer.	Mini computer are more speedy than micro computers.	Micro computer's speed is relatively lower than super or mini computer.
Cost	Super computers are expensive than mini and micro computer.	Mini computers are expensive than micro computer.	Micro computer is least expensive among super and mini computer
Use	Super computers are used for weather forcast and for performing calculations	They are used as central host in a network.	They are used at homes & offices for general use.

Example (ii):

Integrated circuits were small silicone chips used in 3rd generation.

Some benefits of using them over transistors are:-

1) They are smaller in size than transistors. Which reduces computer's overall size.

2) They have higher speed than transistors and are more accurate.

3) IC chips consume less power as compared to transistors.

Weaker responses mostly did not differentiate between minicomputer and microcomputer correctly and swapped their differences such as minicomputer is smaller in size and microcomputer is bigger than minicomputer, microcomputers are faster than minicomputers, microcomputers are costly than minicomputers, etc.

Moreover these responses mostly wrote one or two advantages of ICs over transistors correctly and the incorrect advantages of ICs include ICs are advance than transistors/ ICs can store more data than transistors/ ICs are compulsory for computer but transistors are not/ ICs are portable but transistors are not etc.

Example (i):

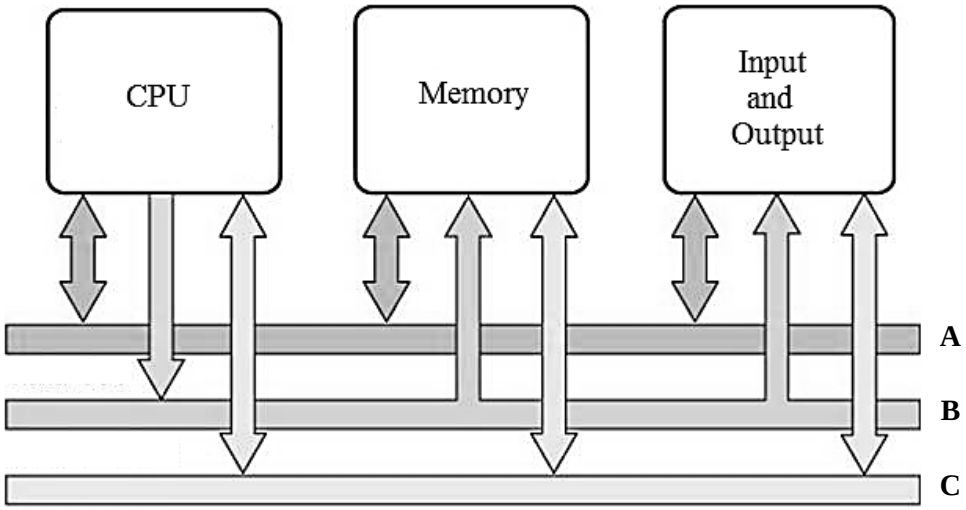
	Supercomputers	Minicomputers	Microcomputers
Size	Supa computers take whole room ~~and it~~	They don't take too much space	They also don't take too much space
Speed	Slow, super computers were slow.	Normal speed	Micro computers work on super fast speed.
Cost	Too expensive	Normal	Expensive
Use	Big industries use this	Office or for home use	Need to use latest technology.

Example (ii):

ICs were more ~~advanced~~ advanced than transistors and were of modern technology they could store more than ~~transistors~~ transistor. It had more advance ~~feat~~ feture feature. It was compulsory for mobiles.

Question 6b:

i. The given image shows the system bus in a typical computer.



Identify address bus, control bus and data bus on the basis of connections shown among CPU, Memory and Input and Output units of a computer system.

A _____

B _____

C _____

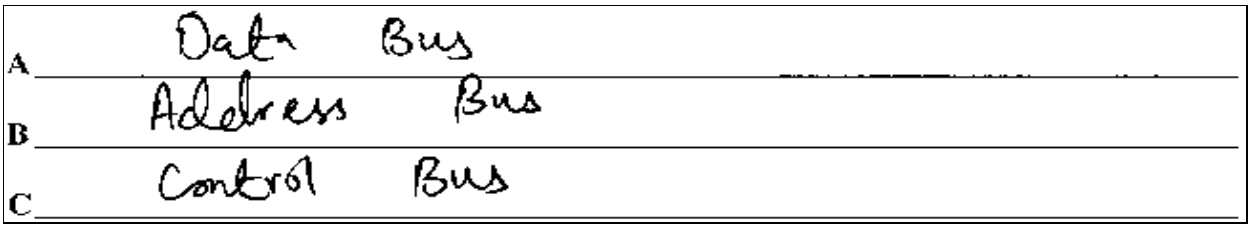
ii. Describe the following types of translators.

Compiler	Interpreter	Assembler

iii. Describe the role of RAM and ROM in computer.

Better responses exhibited good understanding of the three types of buses in computers, i.e. data bus, address bus and control bus and identified them from the figure given in the paper correctly. Similarly, these responses described major functions of three types of translators and did not mix their descriptions with each other such as compiler translates high level program in machine code as whole, interpreter translates high level program in machine code line by line and assembler translates assembly language program into machine code, etc. Moreover, these responses showed good understanding about the role of RAM and ROM and did not swap their description such as RAM is volatile memory/ RAM stores currently running programs/ RAM is temporary memory/ ROM is non-volatile memory/ ROM stores the BIOS/ ROM is permanent memory etc.

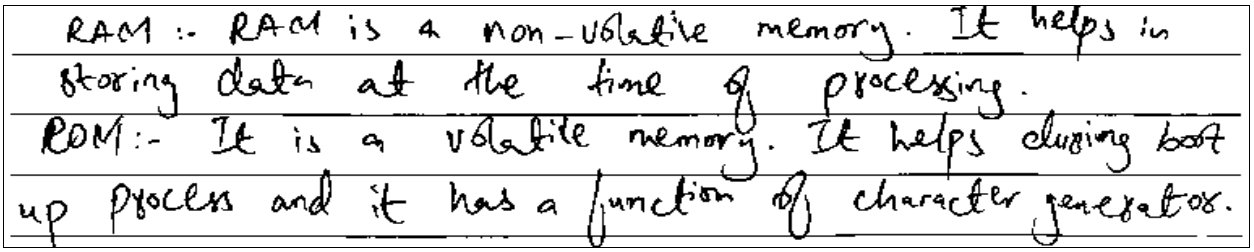
Example (i):



Example (ii):

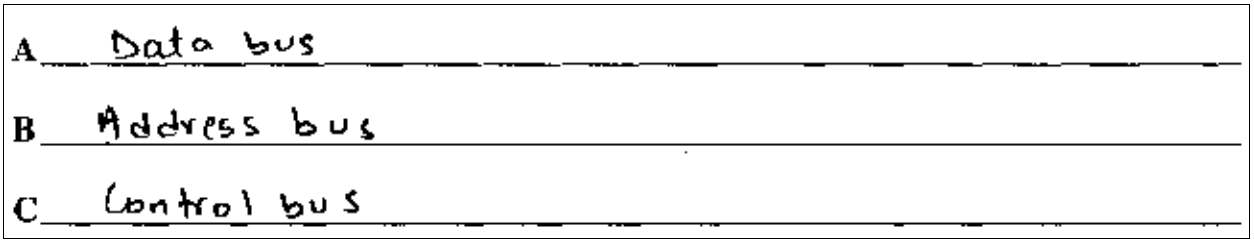
Compiler	Interpreter	Assembler
A compiler is a translator that compiles a whole program before execution.	An Interpreter translates each line and then executes it before going to the next statement.	A language other than high level language is translated by an Assembler. It translates assembly language

Example (iii):

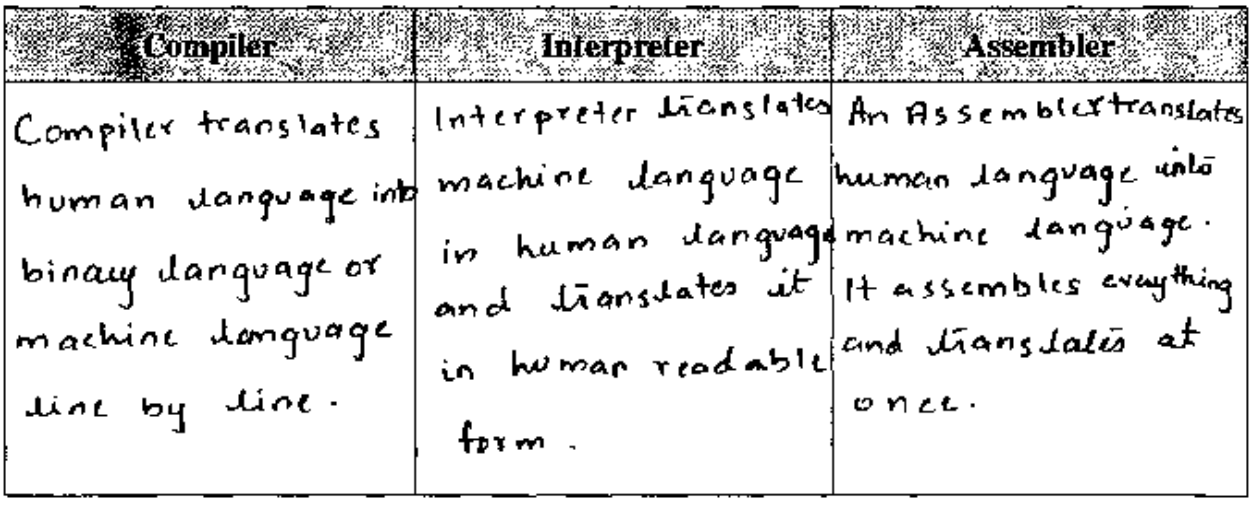


Weaker responses mainly demonstrated that candidates knew the main points required for the solution of this question but they were not able to identify that which point belongs to which term and swapped them, i.e. swapped the names of buses with each other/ swapped the description of compiler and interpreter/ swapped the role of RAM and ROM (volatile and non-volatile) etc.

Example (i):

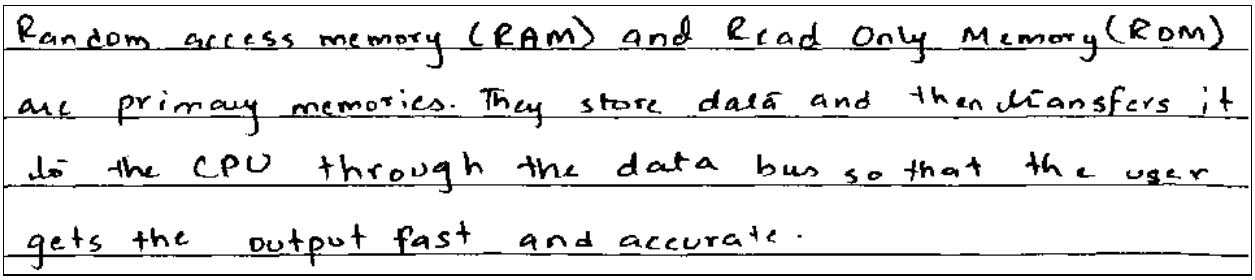


Example (ii):



Compiler	Interpreter	Assembler
Compiler translates human language into binary language or machine language line by line.	Interpreter translates machine language in human language and translates it in human readable form.	An Assembler translates human language into machine language. It assembles everything and translates at once.

Example (iii):


Random access memory (RAM) and Read Only Memory (ROM) are primary memories. They store data and then transfers it to the CPU through the data bus so that the user gets the output fast and accurate.

Question 7a:

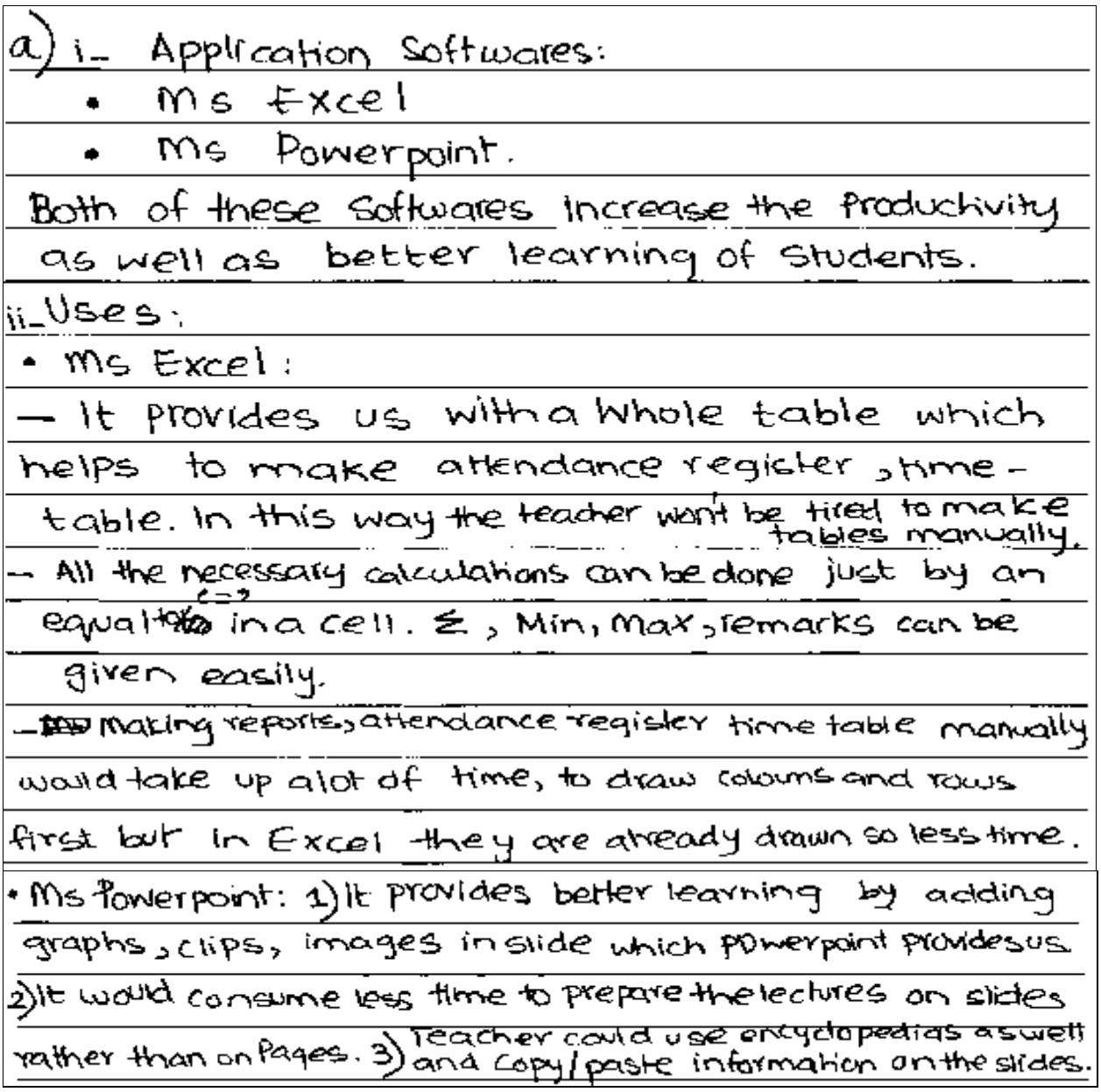
i. Identify any TWO application software that can help a teacher to improve his/ her routine tasks such as preparation of lecture, report cards, attendance registers and time table.

ii. Describe THREE uses of each software identified in part (i).

(**Note:** More than 70% of the candidates attempted part **a** of this question and their performance was much better in part **a** than part **b**. This depicts their confidence over the concept of 'application software' more than 'utility software'.)

Better responses showed good understanding about the types of application software and they identified the relevant software according to the scenario given in the question. Moreover, these responses wrote three pertinent uses of each identified application software.

Example:


a) i- Application Softwares:

- Ms Excel
- Ms Powerpoint.

Both of these softwares increase the productivity as well as better learning of students.

ii- Uses:

- Ms Excel:

— It provides us with a whole table which helps to make attendance register, time-table. In this way the teacher won't be tired to make tables manually.

— All the necessary calculations can be done just by an equal to (=) in a cell. Σ, Min, Max, remarks can be given easily.

— Making reports, attendance register time table manually would take up alot of time, to draw colouns and rows first but in Excel they are already drawn so less time.

- Ms Powerpoint: 1) It provides better learning by adding graphs, clips, images in slide which powerpoint provides us. 2) It would consume less time to prepare the lectures on slides rather than on Pages. 3) Teacher could use encyclopedias as well and copy/paste information on the slides.

Weaker responses mostly tried to describe the uses of identified application software from the perspective of student but the demand of question is to describe the uses from the perspective of teacher/ wrote the features of application software rather than uses in daily routine tasks of a teacher/ wrote general categories of application software such as education software, productivity software, etc.

Example:

1) The two application software that can help a teacher to improve his/her routine task are.

- Education software.
- Productivity software.

a) Education software: It can help teacher to learn how to make report cards. Education software also teaches children how to learn like "How to speak french". Education software from also provide we can not only just learn but we can teach others also.

Productivity software:

It includes spread sheet, Database etc. Productivity software helps a man/women manage his/her buissness. It also helps you to increase in his production.

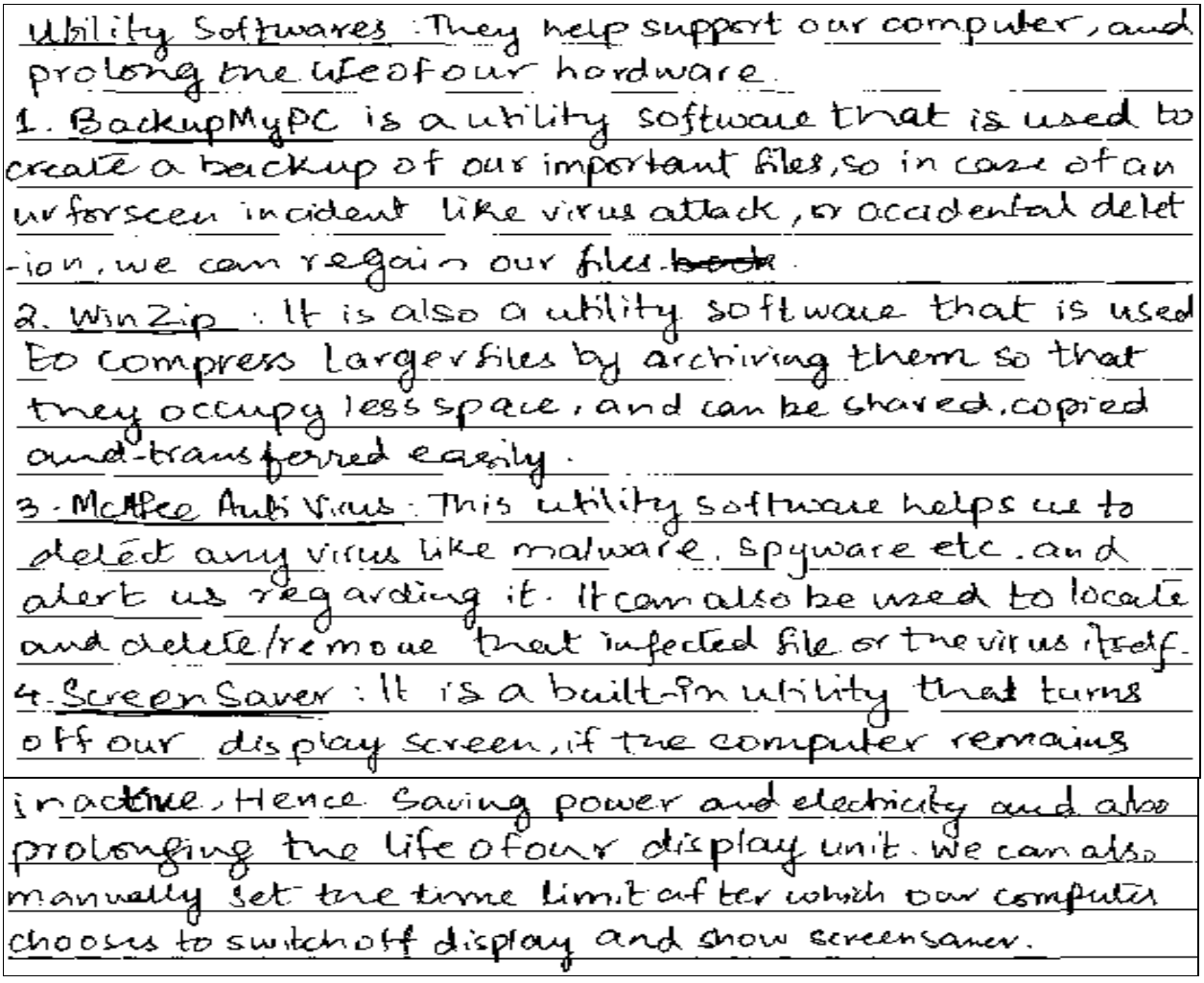
Question 7b:

Utility software is a type of system software used to support the computer infrastructure, distinguishing it from application software which is aimed at directly performing tasks that benefit ordinary users.

Explain the functionality of any FOUR utility software using appropriate examples.

Better responses depicted good understanding of utility software and did not confuse utility software with application software and operating system. These responses wrote valid names of any four utility software and explained their functions.

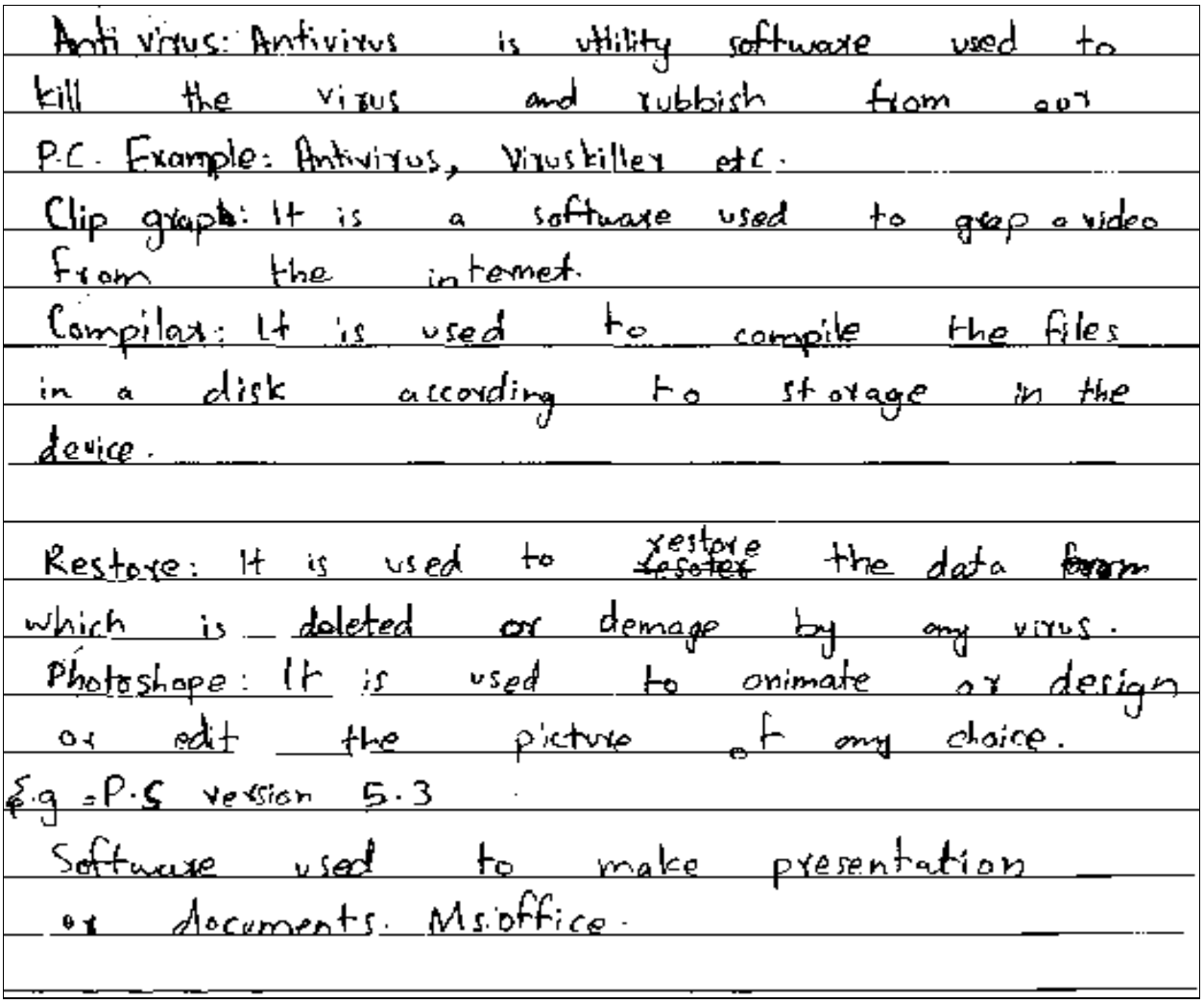
Example:



Utility Softwares: They help support our computer, and prolong the life of our hardware.
1. BackupMyPC is a utility software that is used to create a backup of our important files, so in case of an unforseen incident like virus attack, or accidental delet-ion, we can regain our files ~~back~~.
2. WinZip: It is also a utility software that is used to compress larger files by archiving them so that they occupy less space, and can be shared, copied and transferred easily.
3. McAfee Anti Virus: This utility software helps us to detect any virus like malware, spyware etc. and alert us regarding it. It can also be used to locate and delete/remove that infected file or the virus itself.
4. ScreenSaver: It is a built-in utility that turns off our display screen, if the computer remains inactive, Hence saving power and electricity and also prolonging the life of our display unit. We can also manually set the time limit after which our computer chooses to switch off display and show screensaver.

Most of the *weaker responses* wrote irrelevant or incorrect names of utility software such as compiler, clip graph, restore, DOS, Windows, MS Word, MS PowerPoint etc. Moreover, these responses explained purpose of utility software such as optimization, maintenance, etc. and did not mention names of utility software and their purposes.

Example:


Anti virus: Antivirus is utility software used to kill the virus and rubbish from our P.C. Example: Antivirus, Viruskiller etc.

Clip graph: It is a software used to grep a video from the internet.

Compilar: It is used to compile the files in a disk according to storage in the device.

Restore: It is used to ~~resotes~~ restore the data ~~from~~ which is deleted or demage by any virus.

Photoshape: It is used to animate or design or edit the picture of any choice.
E.g = P.S version 5.3

Software used to make presentation or documents. Ms.office.