Aga Khan University Examination Board

Notes from E-Marking Centre on SSC-I Computer Science Examination May 2017

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 2017 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 input devices, CPU components, binary numbers, word processor and Windows operating system were well attempted. However, questions based on memory unit conversion, presentation software, utility software, disc operating system (DOS) and computer ports were generally not well attempted.

Detailed Comments:

Constructed Response Questions (CRQs)

Question 1:

Consider the types of computers and programming language translators given in the box below.

- Analog Computer
- Digital Computer
- Hybrid Computer
- Assembler
- Compiler
- Interpreter

Complete each statement using an appropriate term from the box. Each term should be used only ONCE.

i. _____ performs arithmetic and logic operations with discrete values.

ii. _____ translates the source code into the object code (machine code).

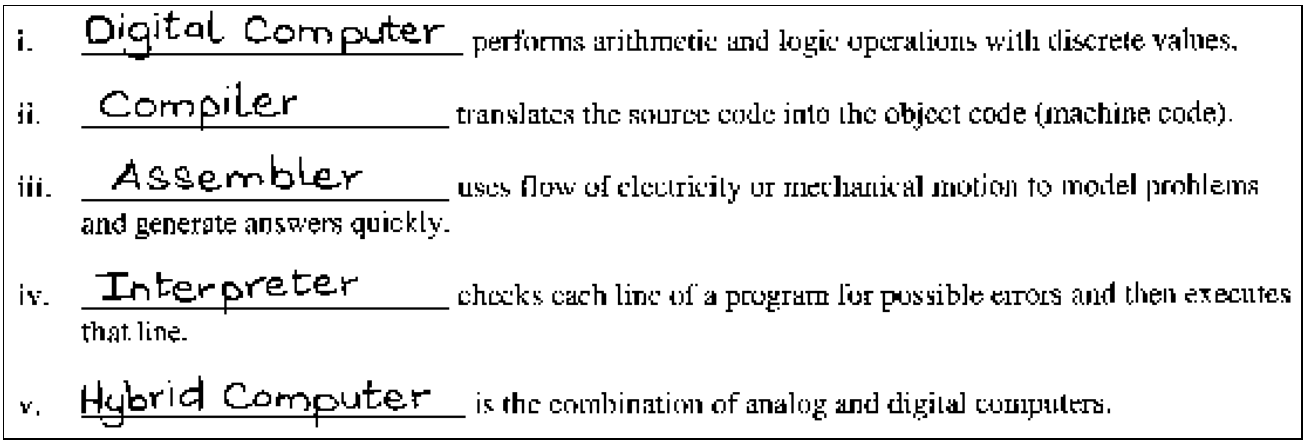
iii. _____ uses flow of electricity or mechanical motion to model problems and generate answers quickly.

iv. _____ checks each line of a program for possible errors and then executes that line.

v. _____ is the combination of analog and digital computers.

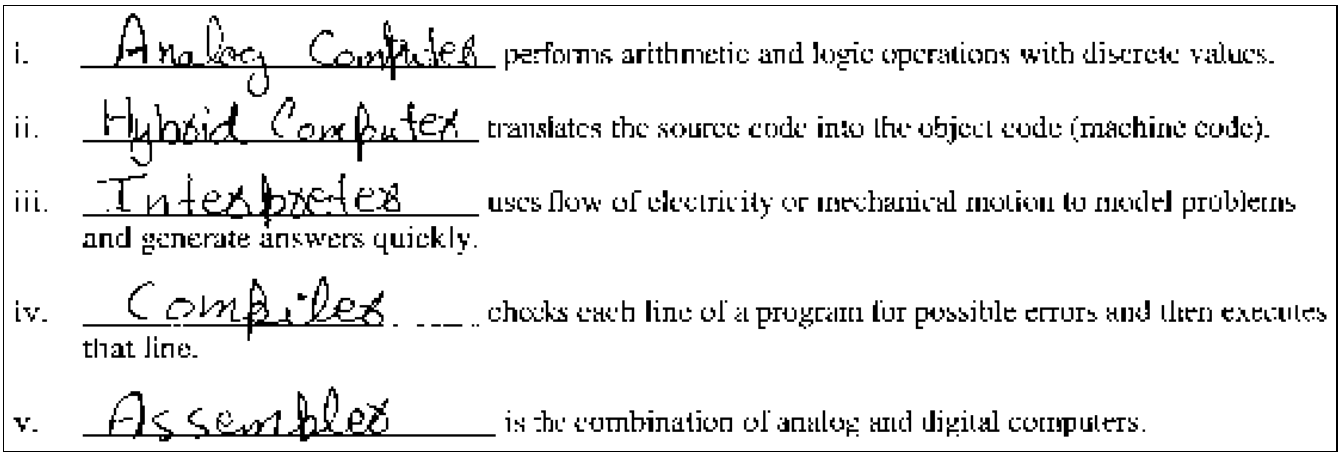
Better responses showed good understanding of types of computers and programming language translators and matched correct terms to complete the given statements.

Example:



Weaker responses depicted confusion between types of programming language translators. Most of the candidates wrote assembler in place of compiler. Moreover, some of these candidates wrote analog in place of digital computer.

Example:



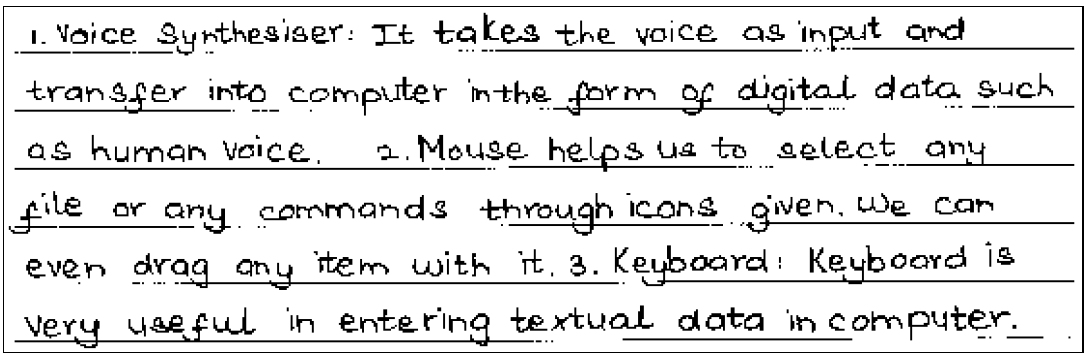
Question 2a:

Describe an appropriate purpose of each of the following input devices.

- Voice Synthesiser
- Mouse
- Keyboard

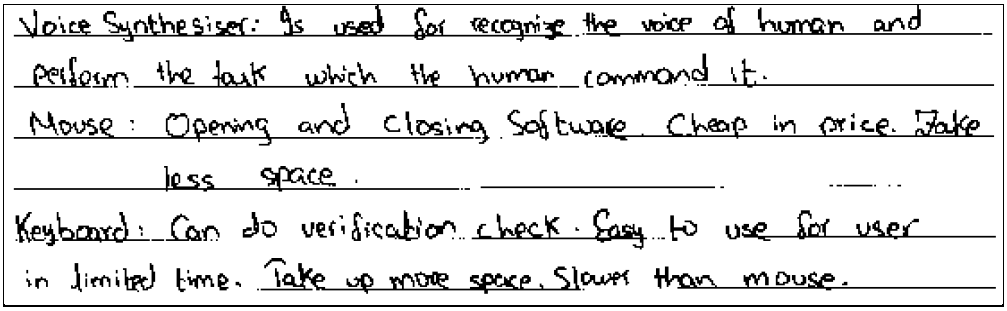
Better responses wrote to-the-point purpose of given input devices such as mouse is a pointing device and keyboard is used for inputting the data and text. However, even better responses were not able to write the specific purpose of voice synthesizer, e.g. it inputs audio signals that are converted into electrical signals/ it takes voice input and transfer into computer in the form of digital data such as human voice.

Example:


1. Voice Synthesiser: It takes the voice as input and transfer into computer in the form of digital data such as human voice. 2. Mouse helps us to select any file or any commands through icons given. We can even drag any item with it. 3. Keyboard: Keyboard is very useful in entering textual data in computer.

Weaker responses were not able to present the main purpose of these input devices. In particular, candidates were not clear about the purpose of voice synthesiser and wrote vague purposes such as detecting voice and performing tasks/ searching voice in computer. Moreover, these responses wrote incorrect purpose of mouse such as opening and closing software/ input device connected with computer to use it. They wrote for general things about keyboard rather writing its purpose such as keyboard is an input device which is connected with CPU and which controls the monitor/ its purpose is to help user or programmer to enter keys etc.

Example:

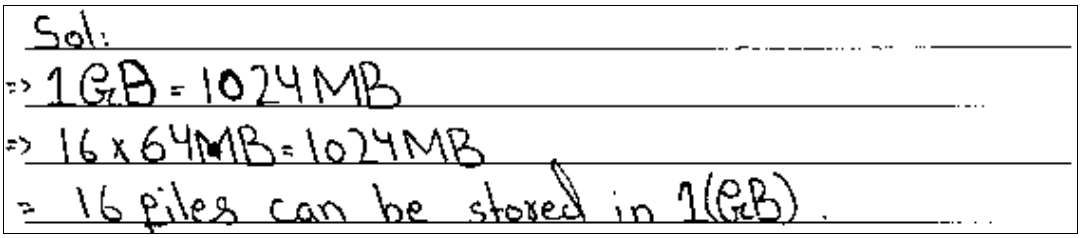


Question 2b:

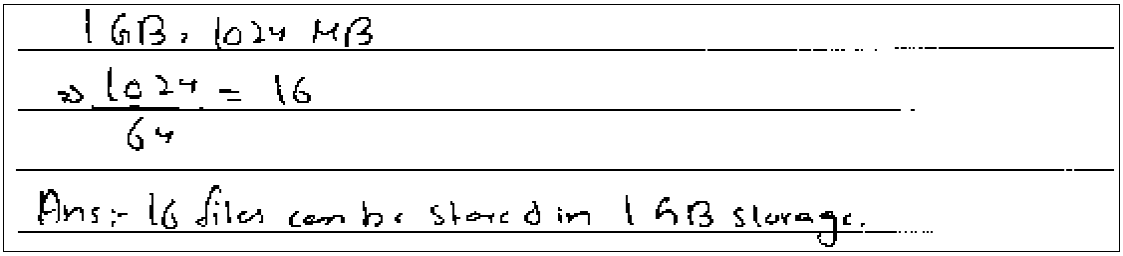
There are some video files and the size of each file is 64 megabyte (MB). How many of these video files can be stored in 1 gigabyte (GB) storage capacity of a flash drive? Show your working.

Better responses exhibited good understanding of conversion from one memory unit to other memory unit. These responses converted 1 GB into 1024 MBs as a first step and then divided 1024 by 64 giving 16 video files as answer or some responses multiplied 64 with 16 giving value of 1024 MBs and calculating the answer, i.e. 16 video files.

Example 1:



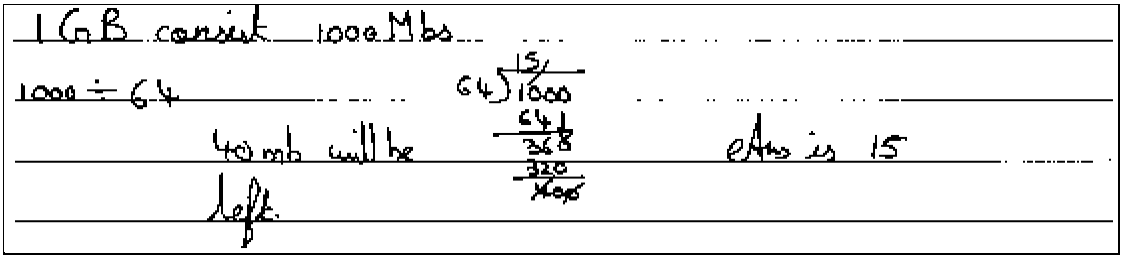
Example 2:



Weaker responses showed lack of understanding regarding the conversion of memory units. Moreover, these responses depicted that students were not clear about whether MB or GB is a bigger memory unit. Also, some of these responses used conventional conversion values rather than memory conversion values, i.e. 1 GB = 1000 MBs instead of 1 GB = 1024 MB.

It was the requirement of question that candidates should show working to reach the answer but most of the weaker responses directly calculated the answer and no working was shown.

Example:



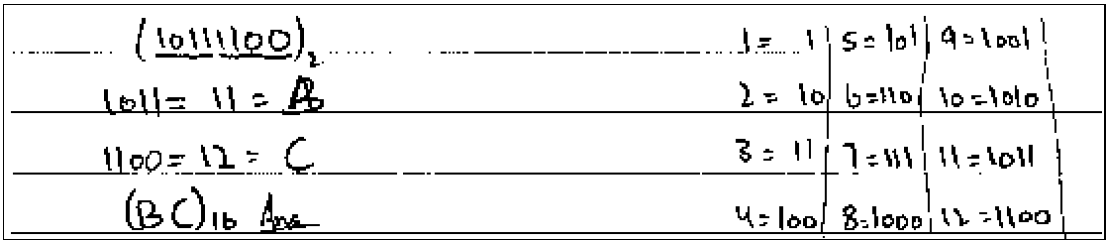
Question 3a:

Convert the given byte into equivalent hexadecimal number. Show your working.

(10111100)2

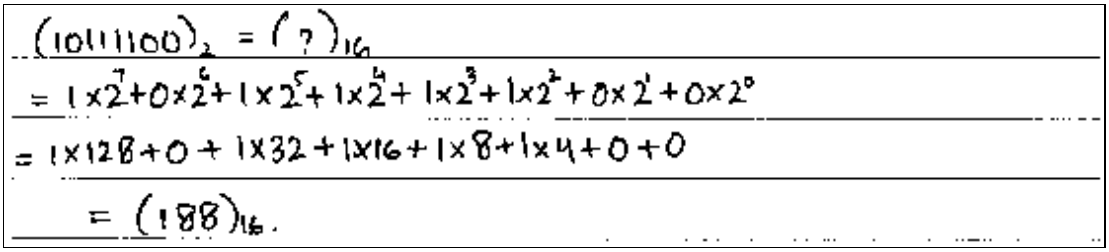
Better responses demonstrated good understanding of converting binary number into hexadecimal number. Most of these responses made two groups of 4 bits and then wrote hexadecimal digit for each group of bits. Some of these responses converted binary number into decimal and then converted decimal number into hexadecimal number. As per the requirement of the question, these responses showed the working required for conversion from binary to hexadecimal number system.

Example:



Weaker responses were either not able to perform correct binary to hexadecimal conversion or they had converted binary number into decimal but could not convert decimal number into hexadecimal number. Moreover, these responses did not show the working required to reach the final answer.

Example:

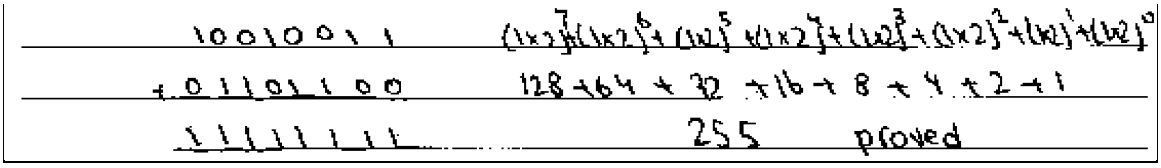


Question 3b:

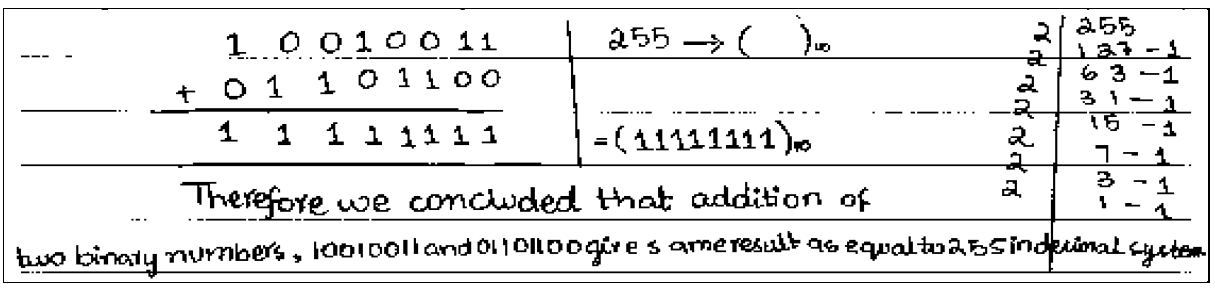
Show that addition of two binary numbers, 10010011 and 01101100, gives a result which is equal to 255 in decimal number system.

Better responses performed the binary addition correctly which gave the binary value $(11111111)_2$. In order to verify whether this binary value is equal to 255 or not, these responses used two methods. In the first method, binary to decimal conversion was performed to get the decimal value 255. In the second method, 255 was converted into binary number which is $(11111111)_2$ and it was shown that the sum of the given binary numbers and the binary equivalent of 255 are the same.

Example 1:

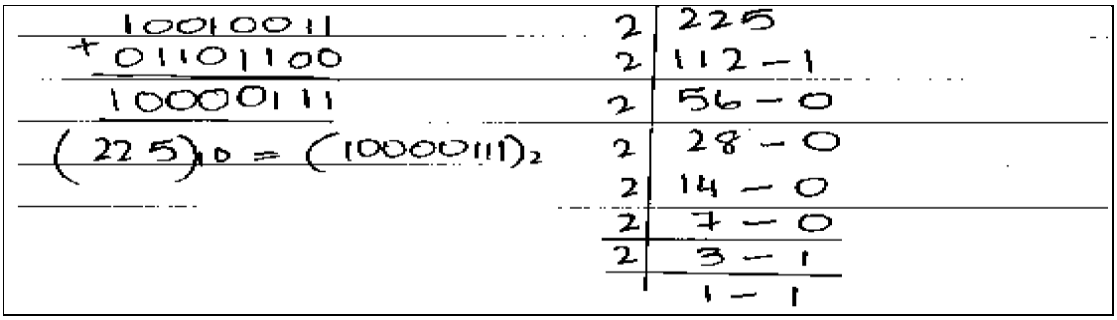


Example 2:



Weaker responses were mostly not able to add the binary numbers correctly due to which the verification of the decimal value 255 was not possible. Also, some weaker responses demonstrated that students misread the given value as 225 instead of 255.

Example:



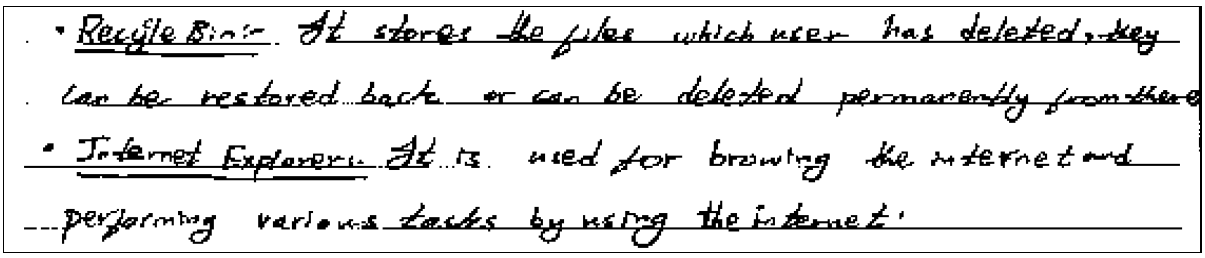
Question 4a:

Recycle Bin and Internet Explorer are two icons on the Windows desktop.

Describe ONE major purpose of each of them.

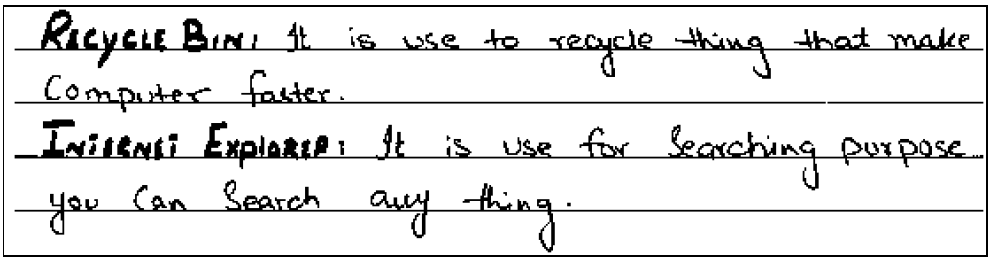
Better responses demonstrated good understanding regarding the purpose of desktop icons, for instance, Recycle Bin is used to restore the deleted files/ if any file or folder is deleted accidently then it goes in Recycle Bin and Internet Explorer is used to search information over the internet/ it is a browser used to search.

Example:



Weaker responses were mostly not able to describe the purpose of Recycle Bin and Internet Explorer clearly. For instance, Internet Explorer is used to search anything on computer/ it is used to explore the things and Recycle bin is used to recycle things to make computer faster/ it is used to save data.

Example:



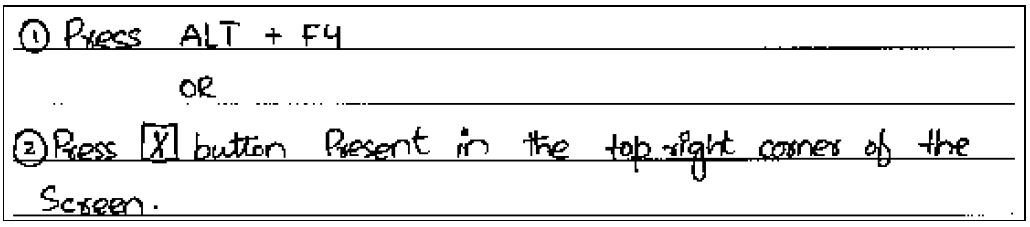
Question 4b:

Nimra has prepared lecture notes using MS Word and she wants to exit from the MS Word file.

Write any TWO appropriate ways that can help Nimra to exit out from the MS Word file.

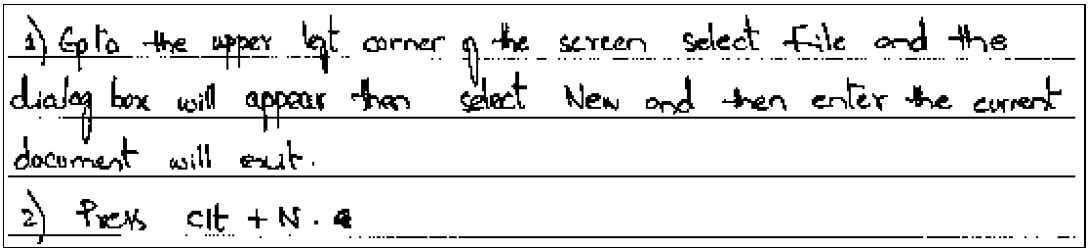
Better responses mostly mentioned the shortcut key (Alt + F4) as keyboard shortcut for closing MS Word file. Clicking on cross sign on top right corner; minimizing the file then right click and finally selecting close option; and click on office button and then click on Exit option were also mentioned as valid methods.

Example:



Weaker responses demonstrated lack of understanding and practice of using MS Word. Although the question was straight forward but still students were not even able to write easiest way to close MS Word file, i.e. keyboard shortcut (Alt + F4).

Example:



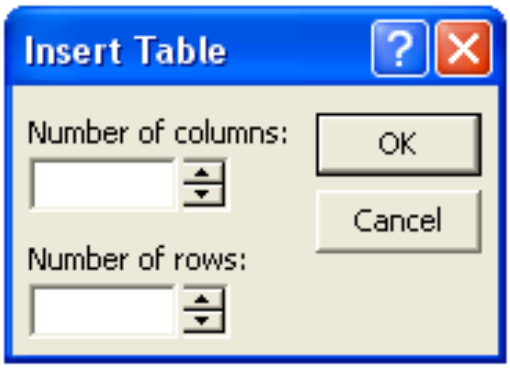
Question 4c:

i. Omar wants to open an MS PowerPoint file. Write the keyboard shortcut that he can use to open the MS PowerPoint file.

ii.

Student ID	Student Name	Class	Fee Paid
H110	Adeel Ahmed	XI	Yes
H111	Saima Jamil	XI	Yes
H112	Faheem Arshad	XI	No
H113	Sidra Zafar	XII	No

To insert the above given table in MS PowerPoint, write the minimum number of rows and columns in the below given image.k)

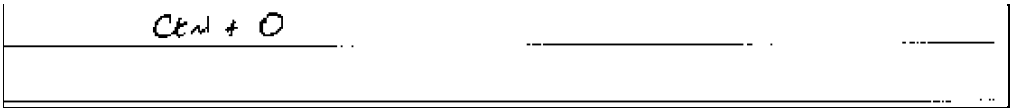


Better responses wrote the correct keyboard shortcut to open an MS PowerPoint file i.e. Ctrl + O. Moreover, these responses were not able to identify and differentiate between rows and columns.

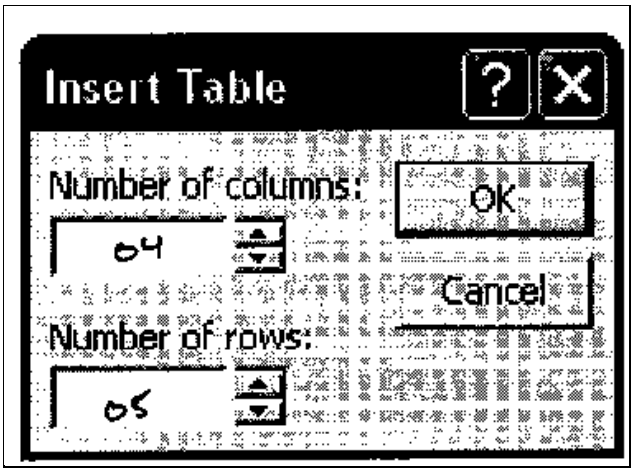
(**Note:** Interestingly, for such an easy question, there were very few better responses and most of them were weaker responses.)

Example:

(i)



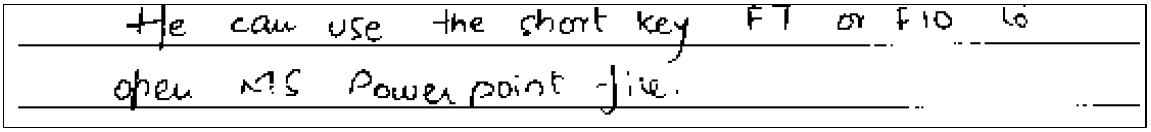
(ii)



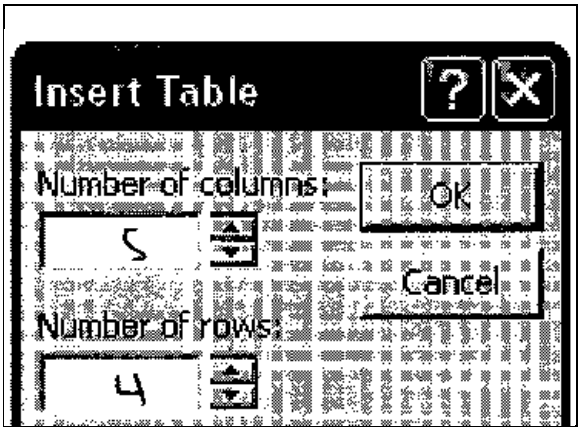
Weaker responses depicted that candidates lack understanding regarding rows and columns in a table. Most of them wrote 4 rows and 4 columns or 5 rows and 4 columns instead of 4 columns and 5 rows. Also, such responses wrote incorrect keyboard shortcut to open MS PowerPoint file such as function keys F7/ F10. Few of such responses misunderstood the question and wrote methods to open a PowerPoint file, e.g. go to run and type PowerPoint ppt and then click OK/ press Windows button, go in MS Office and press Enter to open the MS PowerPoint file.

Example:

(i)



(ii)



Question 5a:

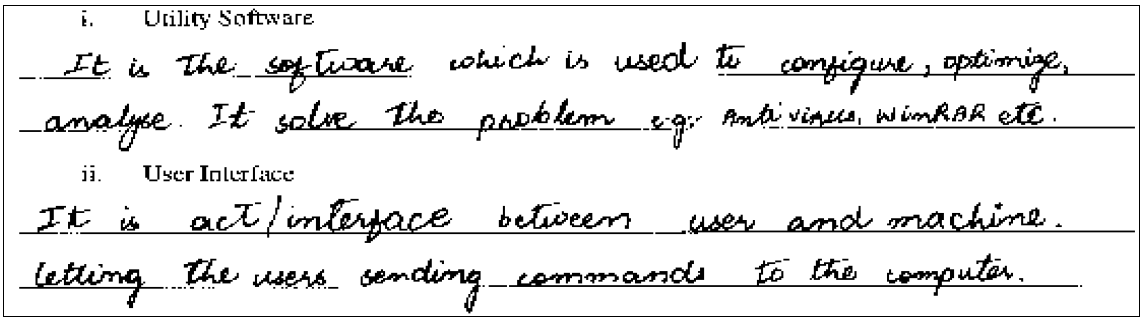
Describe the purpose of each of the following.

i. Utility Software

ii. User Interface

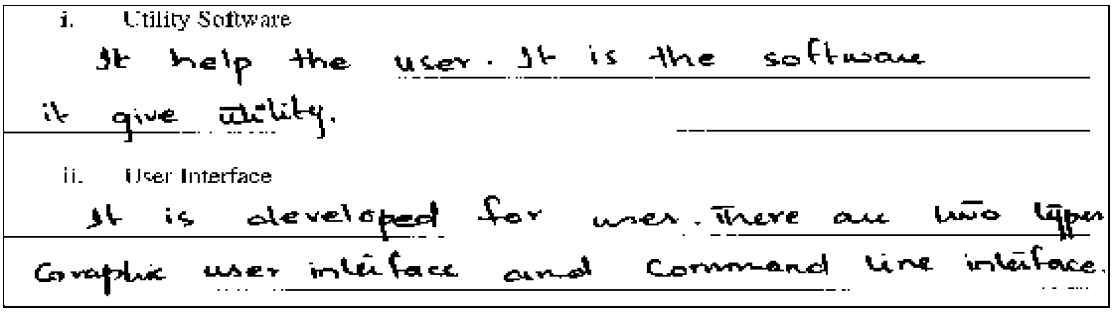
Better responses displayed a good understanding of purpose of utility software and user interface. For instance utility software is used to configure, optimise and analyse computer system/ it helps to enhance the performance of computer system and user interface is an interface between user and machine which allows user to send instructions and commands to the computer system/ it allows interactions between user and machine.

Example:



Weaker responses were not able to describe the purpose of utility software and instead wrote the names of utility software such as antivirus and disk defragmenter/ it is software designed for utility bills. Moreover, some of these responses wrote types of user interface instead of writing purpose of user interface.

Example:



Question 5b:

In disk operating system (DOS), users have to perform each task by using commands.

Write appropriate DOS commands to solve the given problems.

i. Change present working directory from C:\DOS to C:\GAMES\PACEM

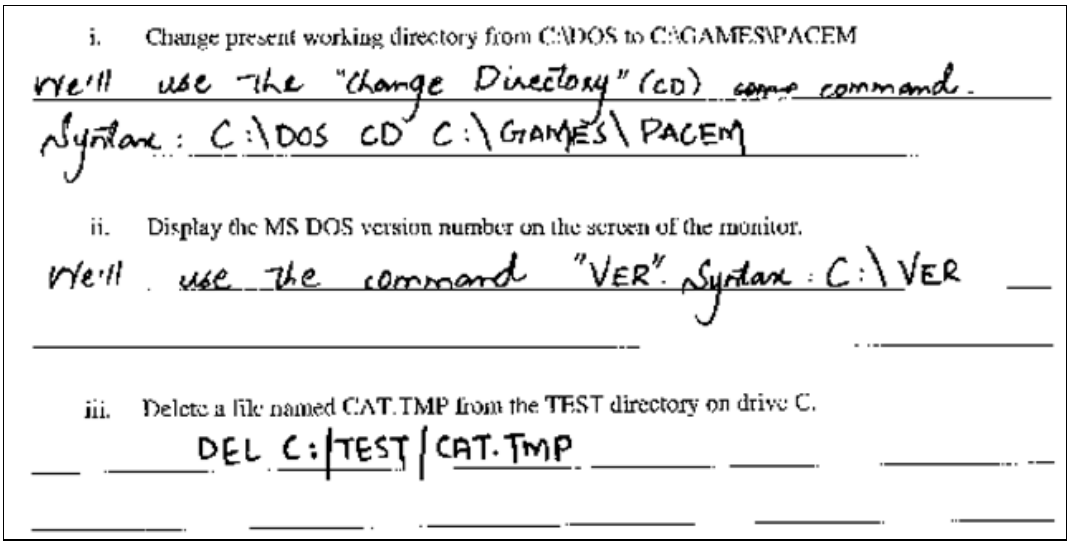
ii. Display the MS DOS version number on the screen of the monitor.

iii. Delete a file named CAT.TMP from the TEST directory on drive C.

Better responses demonstrated good understanding of DOS commands. These commands used the directories and paths specified in the question to perform the required tasks rather than just writing the command only.

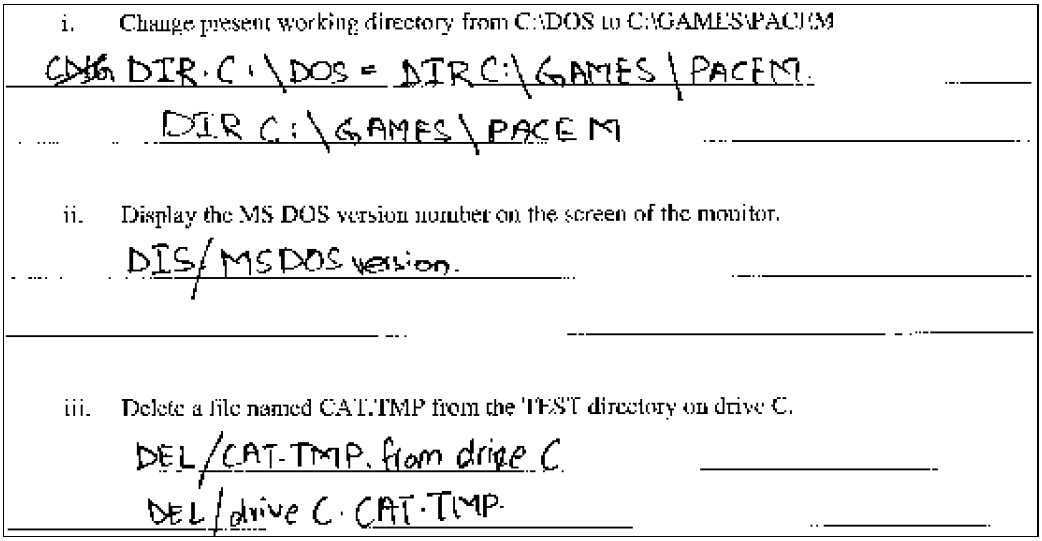
(**Note:** There were very few better responses for this question which is similar to the trend observed last year for the question given from the topic of DOS commands.)

Example:



Weaker responses showed lack of understanding and practice of DOS commands. Most of these responses wrote incorrect/ incomplete DOS commands. It seems that candidates ignored the directories and paths specified in the given tasks while writing the DOS commands. Moreover, these responses wrote incomplete DOS command keywords.

Example:



Extended Response Questions (ERQs)

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

Question 6a:

i. Describe the purpose of central processing unit (CPU), control unit (CU), memory unit (MU) and arithmetic logic unit (ALU) in a computer system?

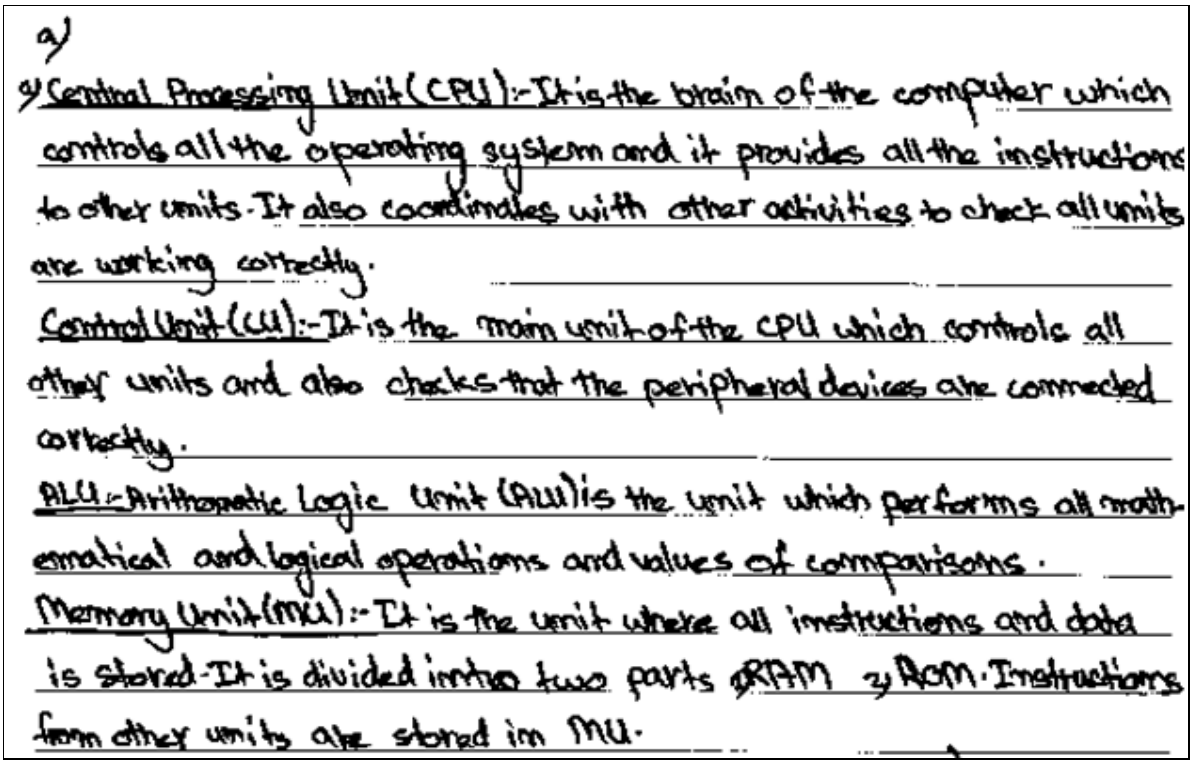
ii. Write any THREE advantages of using universal serial bus (USB) port over parallel port?

(**Note**: Most of the candidates opted part **b** of this question and they performed well.)

Better responses described the appropriate purposes of CPU, CU, MU and ALU such as CPU is located on motherboard and it is the brain of the computer system, CU controls all other units and sends control signals to these units, MU is the place where all the instructions and data is stored and ALU performs all arithmetic and logic operations.

Moreover, these responses wrote advantages of USB port over parallel port, such as, USB port is smaller in size; it is faster than parallel port; it is plug and play port; modern devices such as smart phones, digital cameras are connected with computer system via USB port.

Example:

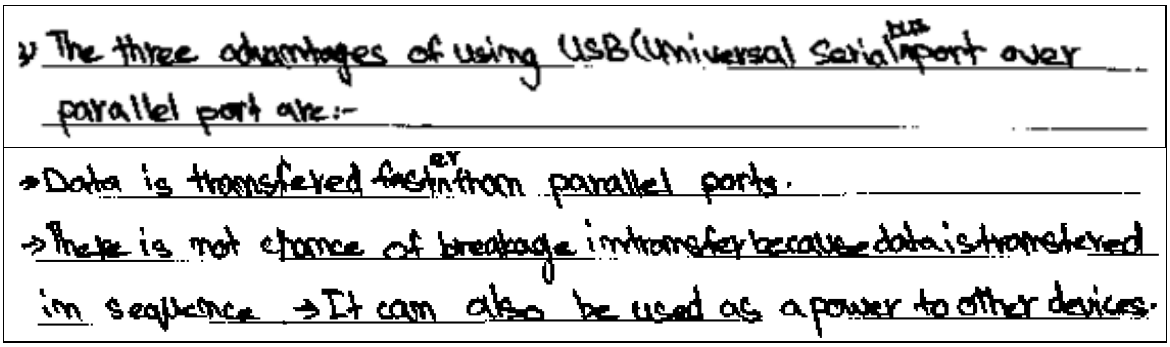

a)

a) Central Processing Unit (CPU):- It is the brain of the computer which controls all the operating system and it provides all the instructions to other units. It also coordinates with other activities to check all units are working correctly.

Control Unit (CU):- It is the main unit of the CPU which controls all other units and also checks that the peripheral devices are connected correctly.

ALU:- Arithmetic Logic Unit (ALU) is the unit which performs all mathematical and logical operations and values of comparisons.

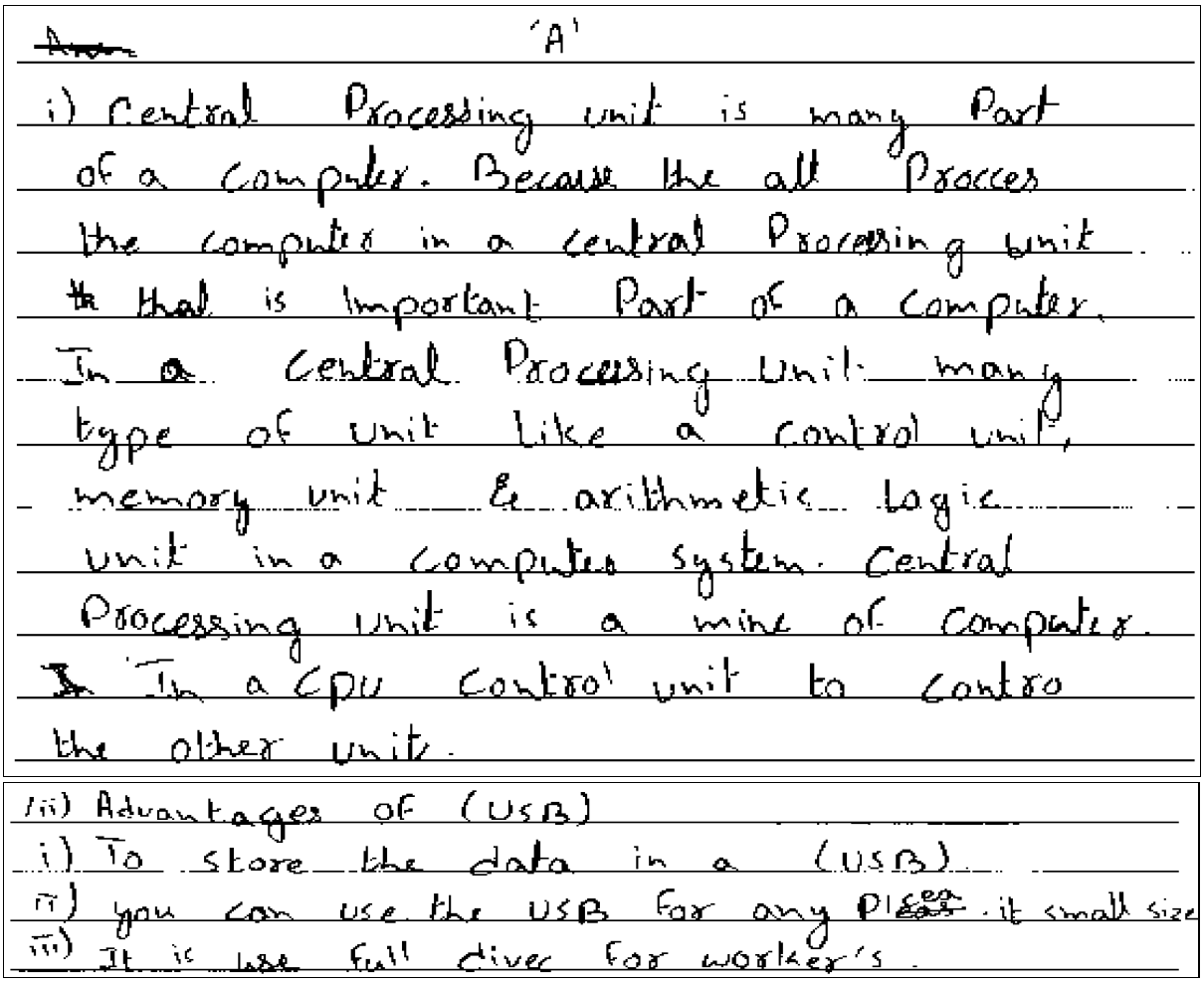
Memory Unit (MU):- It is the unit where all instructions and data is stored. It is divided in two parts a) RAM b) ROM. Instructions from other units are stored in MU.



Weaker responses mostly depicted the confusion between USB port and USB flash drive and wrote that it can easily be taken from one place to another place/ it can store data and files/ easy to find data inside USB/ easy to copy, paste and edit data in USB.

There were some weaker responses that showed lack of understanding about the purpose of CPU, MU, CU and ALU and wrote incorrect or very general things about these units.

Example:



Question 6b:

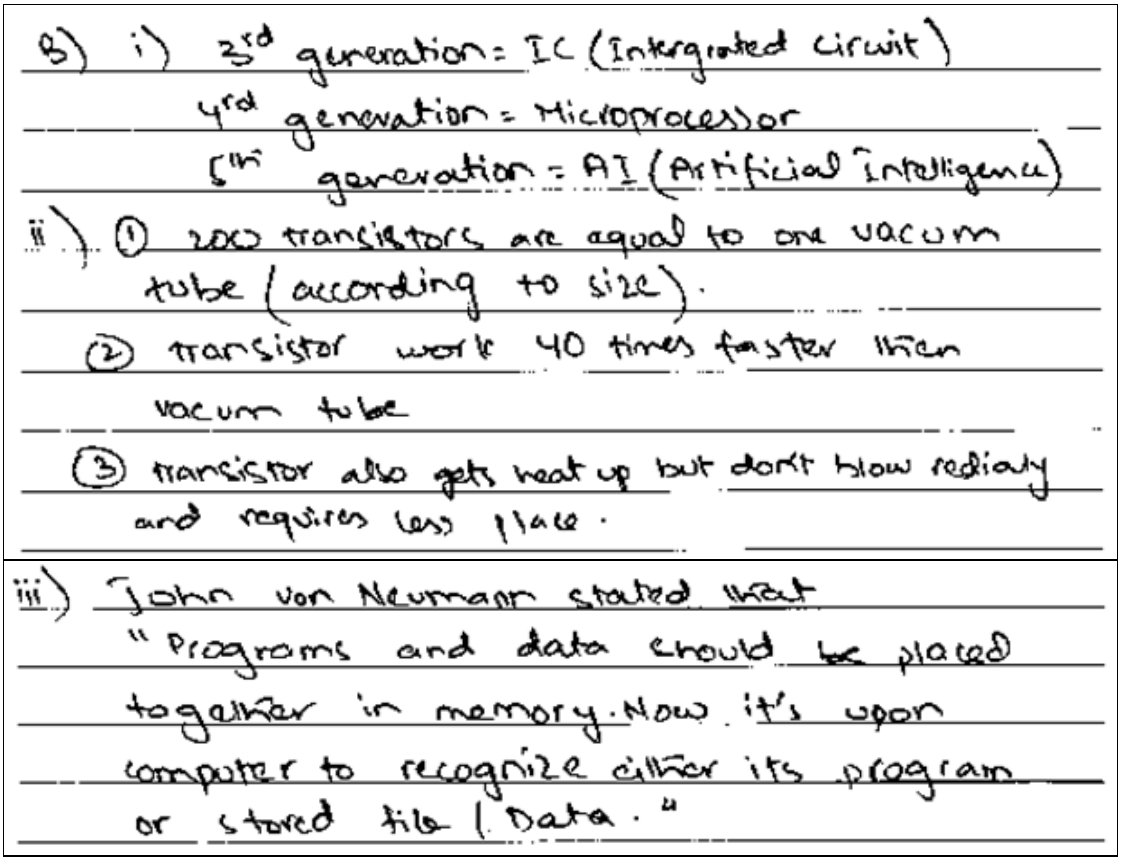
i. There are FIVE generations of computers till date. Name the major technologies used in third, fourth and fifth generation of computers?

ii. Write any THREE advantages of using transistors instead of vacuum tubes in second generation of computers as major technology.

iii. State the John von Neumann theory which became the basis of modern computer systems?

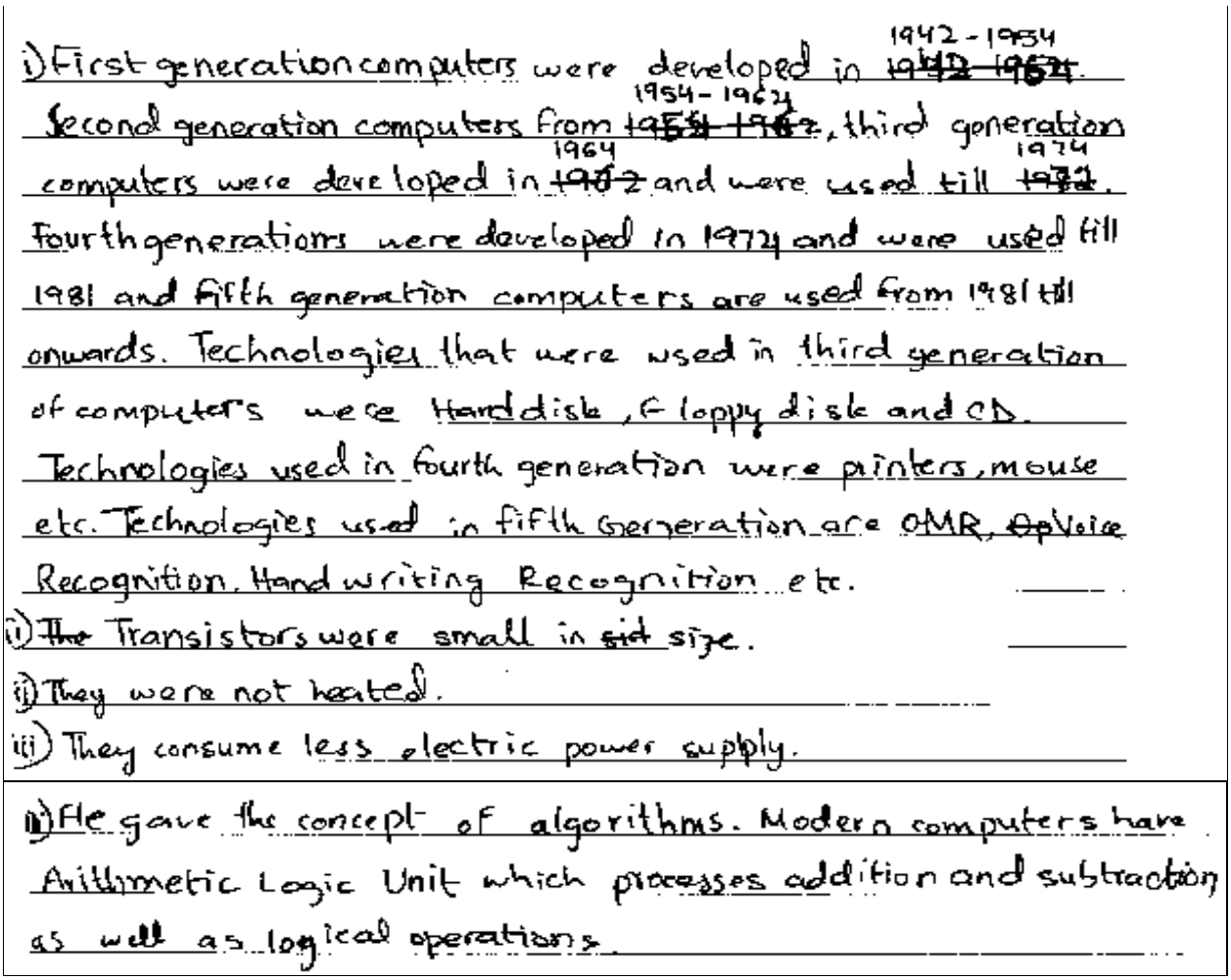
Better responses exhibited good understanding of the technologies used in different generations of computers and correctly named the major technologies used in third, fourth and fifth generation of computers. Moreover, these responses showed the ability to distinguish transistors (second generation technology) from vacuum tubes (first generation technology) and wrote differences such as transistors are smaller in size/ they do not get heated and burn out/ these are cheaper in cost than vacuum tubes. Likewise, these responses stated accurate concept of John von Neumann theory which gave birth to the idea of stored program.

Example:



Weaker responses mainly demonstrated confusion between the technologies used in different generations and storage and peripheral devices invented during the evolution of these generations, e.g. in third generation, there was magnetic drive; in fourth generation, there was floppy disk; and in fifth generation, there was CD and DVD. Moreover, these responses were not able to state the main idea of John von Neumann's theory and wrote general statements such as this theory became the basis of modern computer/ he gave the concepts of ALU, addition, subtraction and logical operations.

Example:



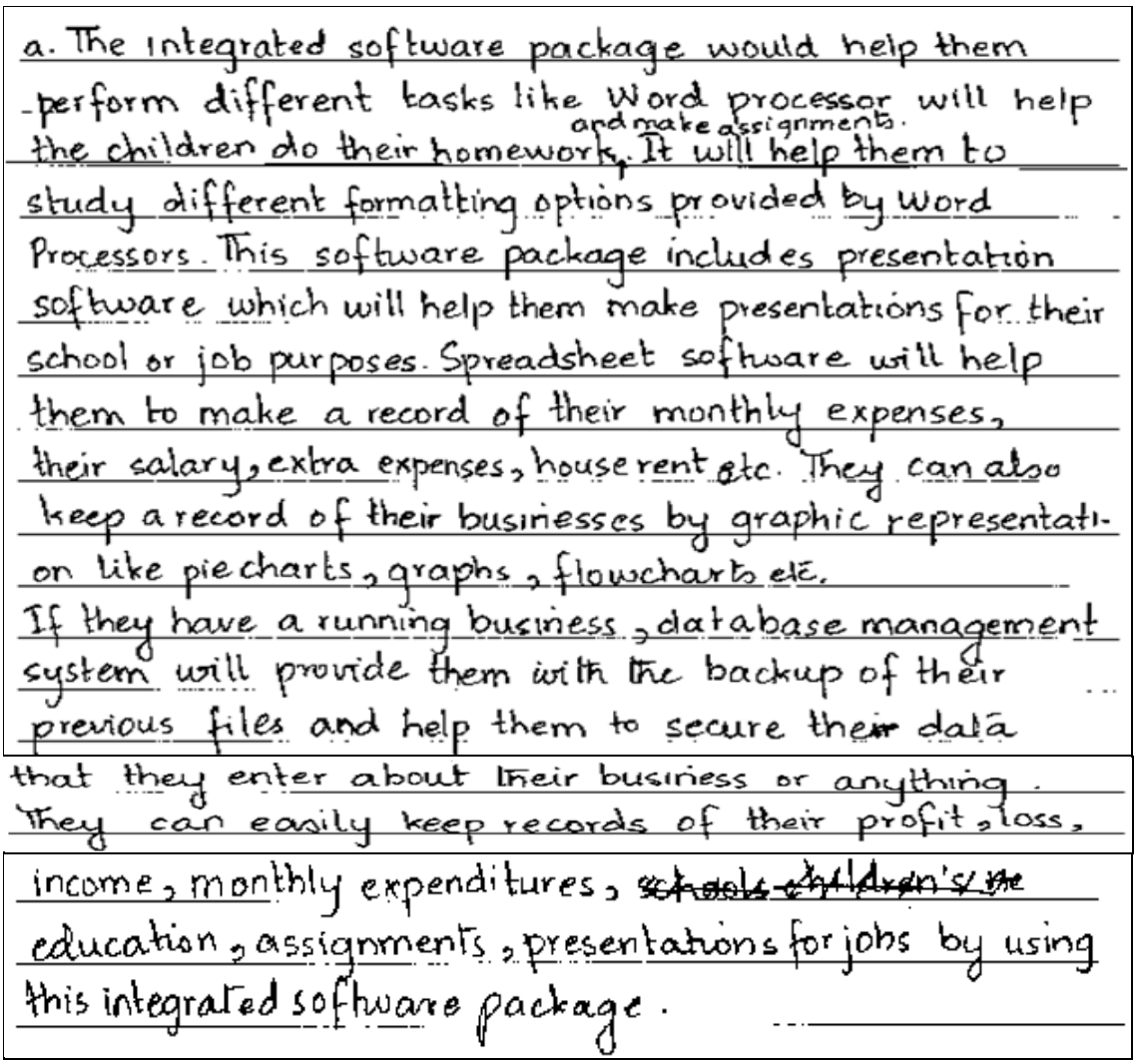
Question 7a:

A family purchases three new PCs and installs an integrated software package which includes the features of word processing, spread sheet, presentation and database. Explain in detail how this integrated software package would help this family in performing different tasks.

(**Note:** Candidates attempted both parts of this question almost equally but their performance was better in part **a** was better than part **b**.)

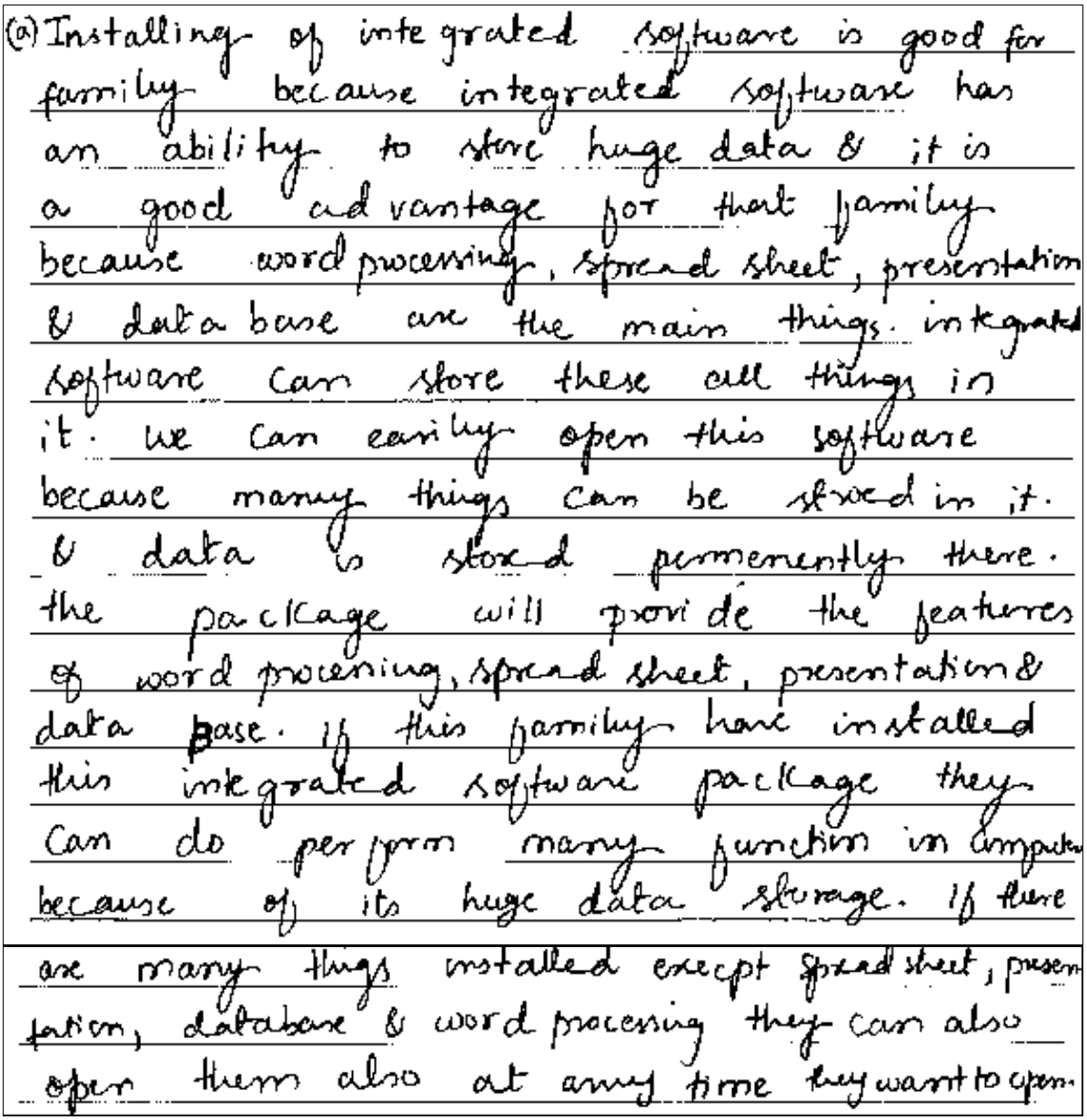
Better responses showed good understanding about the features of all four software, i.e. word processing, spread sheet, presentation and database software, and related these features to the different tasks performed by the family and explained well how these software can help to complete these tasks.

Example:


a. The integrated software package would help them perform different tasks like Word processor will help the children do their homework and make assignments. It will help them to study different formatting options provided by Word Processors. This software package includes presentation software which will help them make presentations for their school or job purposes. Spreadsheet software will help them to make a record of their monthly expenses, their salary, extra expenses, house rent etc. They can also keep a record of their businesses by graphic representation like pie charts, graphs, flowcharts etc.
If they have a running business, database management system will provide them with the backup of their previous files and help them to secure their data that they enter about their business or anything. They can easily keep records of their profit, loss, income, monthly expenditures, ~~schools children's~~ education, assignments, presentations for jobs by using this integrated software package.

Weaker responses mostly tried to explain the integrated software package and were unable to write the features of the four given software that can help the family to complete their tasks. For instance, they wrote that integrated software can store many things in it/ it helps in various tasks.

Example:


(a) Installing of integrated software is good for family because integrated software has an ability to store huge data & it is a good advantage for that family because word processing, spread sheet, presentation & data base are the main things. integrated software can store these all things in it. we can easily open this software because many things can be stored in it. & data is stored permenently there. the package will provide the features of word procesing, spread sheet, presentation & data base. If this family have installed this integrated software package they can do perform many function in computer because of its huge data storage. If there are many things installed execpt spread sheet, presentation, database & word procesing they can also open them also at anny time they want to open.

Question 7b:

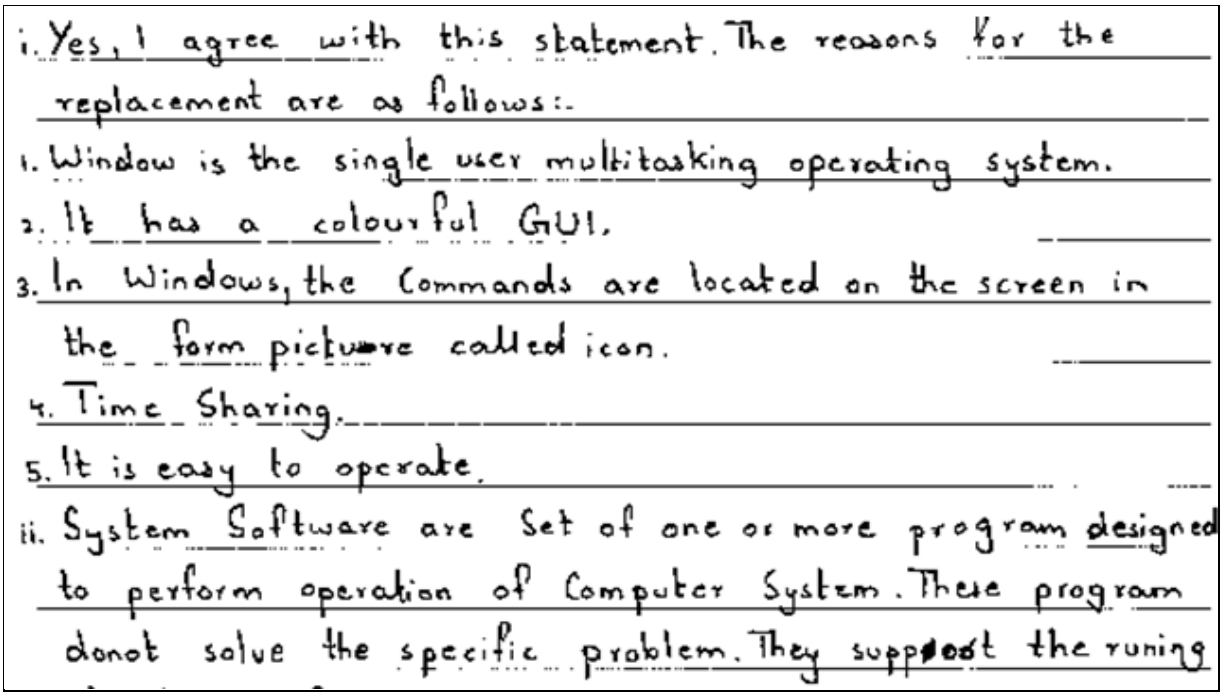
i. 'Disc operating system (DOS) is almost replaced by the Windows.'
Justify this replacement by providing any FIVE valid reasons.

ii. System software and application software are TWO major types of software in computer system.
Describe each type of software and give an example of system software.

Better responses wrote relevant reasons due to which DOS is replaced by Windows such as DOS cannot do multiple tasks at a time but Windows can do/ DOS has no GUI but Windows has GUI/ Windows is colorful but DOS is black screen with white text on it/ mouse cannot be used in DOS but it is used in Windows a lot/ to perform any task in DOS we type commands but in Windows we use mouse to perform most of the tasks.

Moreover, these responses depicted good understanding of system software and application software and properly described them along with example of system software, i.e. operating system, Windows, DOS, etc.

Example:


i. Yes, I agree with this statement. The reasons for the replacement are as follows:-

1. Window is the single user multitasking operating system.
2. It has a colourful GUI.
3. In Windows, the Commands are located on the screen in the form picture called icon.
4. Time Sharing.
5. It is easy to operate.

ii. System Software are Set of one or more program designed to perform operation of Computer System. These program donot solve the specific problem. They support the runing

of other software, and Communicate with the peripheral devices. They are also called as System package for e.g MS Windows, DOS. Application software are set of one or more program designed to carryout operation for a specified applicatation. These program solve specific problem. Application software run via software pakage and not communicate peripheral devices, they are also called Application pakage for e.g MS word, MS Powerpoint.

Most of the *weaker responses* wrote irrelevant or incorrect reasons to describe the supremacy of Windows over DOS.

Moreover, such responses did not mention example of system software, instead of that, they mentioned the example of application software rather than mentioning the example of system software.

Example: