Aga Khan University Examination Board

Notes from E-Marking Centre on SSC I Computer Science Examination May 2016

Introduction

This document has been produced for the teachers and candidates of SSC I (Class IX) Computer Science. It contains comments on candidates' responses to the 2016 Secondary School Certificate (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 Student Learning Outcomes 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.

Detailed Comments:

Constructed Response Questions (CRQs)

Question 1:

Write ONE feature of each of the following computing devices.

i. Pascaline
ii. Punch cards
iii. EDVAC
iv. ENIAC
v. Analytical Engine

Better responses stated features of **Pascaline**; for instance, it was the world's first mechanical adding machine/ it consists of wheels, gears & dials/ it can add and subtract numbers/ it consists of a series of wheels or dials as well as drums with digits 0-9.

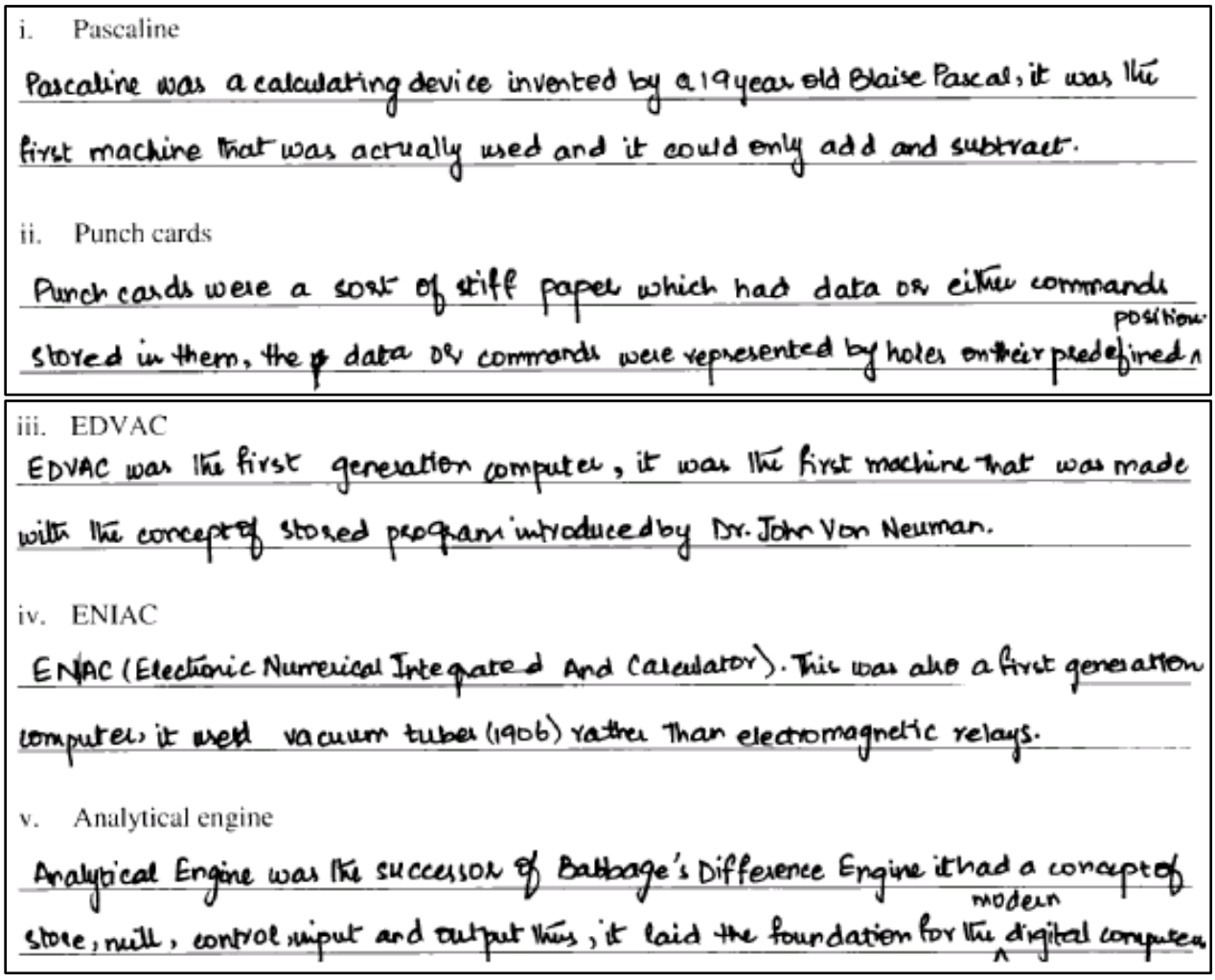
Also, these responses wrote features of **Punch cards** including it could read information which had been punched into the cards automatically/ it is an Input and Output device/ cards are punched to store data/ series of holes were used to store data

Moreover, these responses penned features of **EDVAC** such as it was first computer using the concept of stored program/ first generation computers with vacuum tubes/ it was huge in size/ it can perform 5000 (Five thousand) calculations per second/ it could work and operate on numbers that are in discrete or discontinuous form/ consumes lots of electricity/ it generated lots of heat.

Likewise, these responses listed features of **ENIAC**; for example, it was the first large, **general purpose computer**/ it was huge/large in size/ it could perform 5000 (five thousand) calculations per second/ first generation computers with vacuum tubes/ consumes lots of electricity and generate lots of heat.

Furthermore, these responses stated features of **Analytical Engine** including it was developed by father of computer, Charles Babbage/ it was the foundation for the modern computer/ the idea of analytical engine was much more than a calculator/ it gave concept of a processor/CPU/ it gave the idea of a true computer/ it was an automatic computer. Input, output and storage were part of this type of computer.

Example:



i. Pascaline

Pascaline was a calculating device invented by a 19 year old Blaise Pascal, it was the first machine that was actually used and it could only add and subtract.

ii. Punch cards

Punch cards were a sort of stiff paper which had data or either commands stored in them, the data or commands were represented by holes on their predefined position

iii. EDVAC

EDVAC was the first generation computer, it was the first machine that was made with the concept of stored program introduced by Dr. John Von Neuman.

iv. ENIAC

ENIAC (Electronic Numerical Integrated And Calculator). This was also a first generation computer, it used vacuum tubes (1906) rather than electromagnetic relays.

v. Analytical engine

Analytical Engine was the successor of Babbage's Difference Engine it had a concept of store, mill, control, input and output thus, it laid the foundation for the modern digital computer

Weaker Responses were mostly vague or too general. These responses wrote features of **Pascaline**; for instance, it is a computing device/ it is used to insert data into a computer/ it was a calculating device/ it is used to calculate simple problems/ it is used to perform arithmetical operations

Also, these response stated features of **Punch Cards** including a device which punch the cards/ punch cards belong to second or third generation of machines/ a card in which there are holes/ it was used in looms.

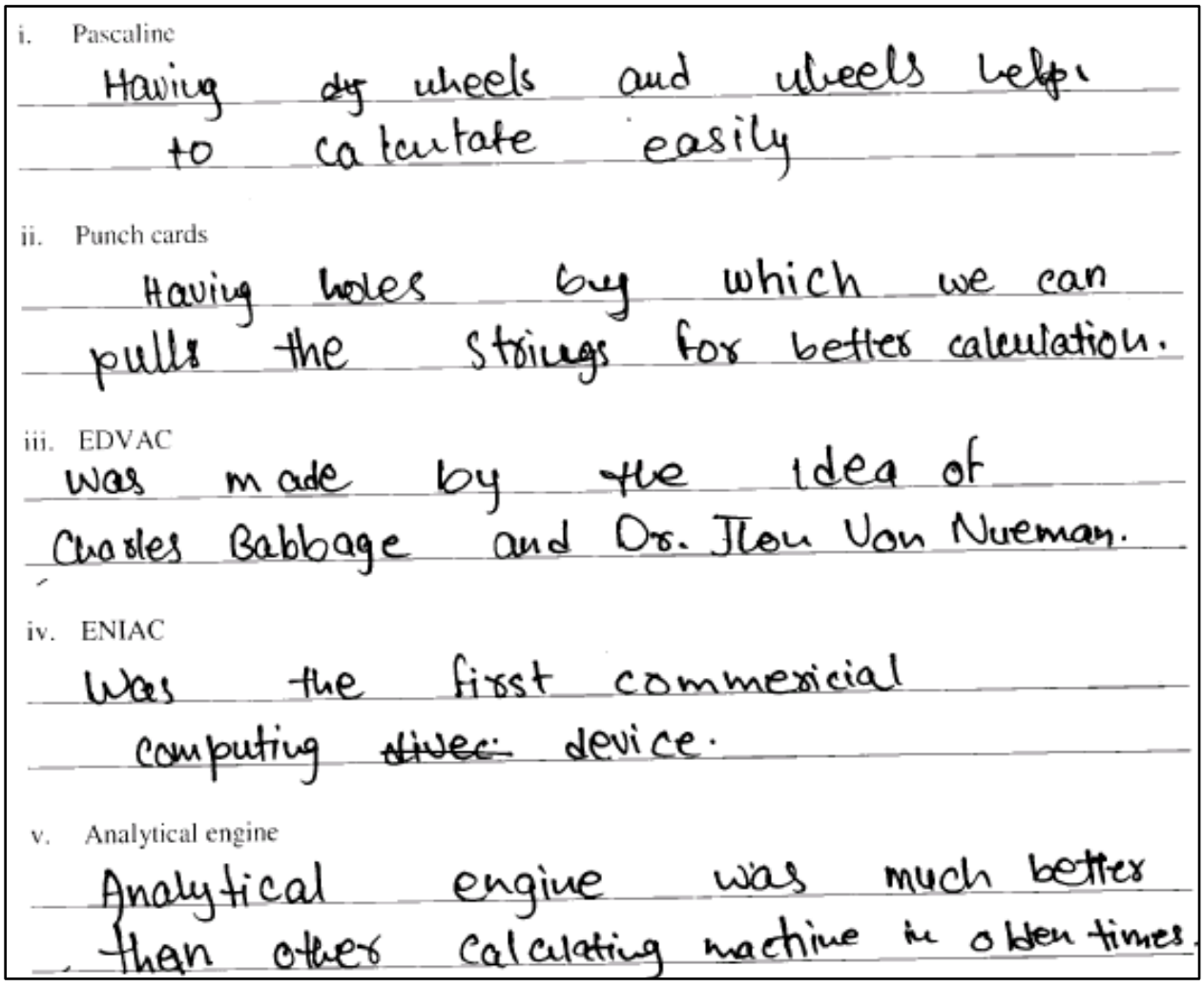
Moreover, these responses penned features of **EDVAC** such as Electronic Discrete Variable Automatic Computer which is full form of EDVAC/ it helps to do only calculations/ it was an electronic computer/ it is a computing device.

Likewise, these responses listed features of **ENIAC**; for example, Electronic Numerical Integrator And Computer which is full form of ENIAC/ It helps to do only calculations/ it was an electronic computer/ it is a computing device.

Furthermore, these responses wrote features of **Analytical Engine** such as it helps to do only arithmetical calculations/ a kind of engine inserted in a computer/ it is a computing device.

Candidates are strongly advised not to write full forms instead of features/advantages/uses and avoid writing same features/advantages/uses of two different things; for example, EDVAC and ENIAC both were first generation computers with vacuum tubes so, in such cases, writing the same feature for both is not advisable.

Example:



Question 2a

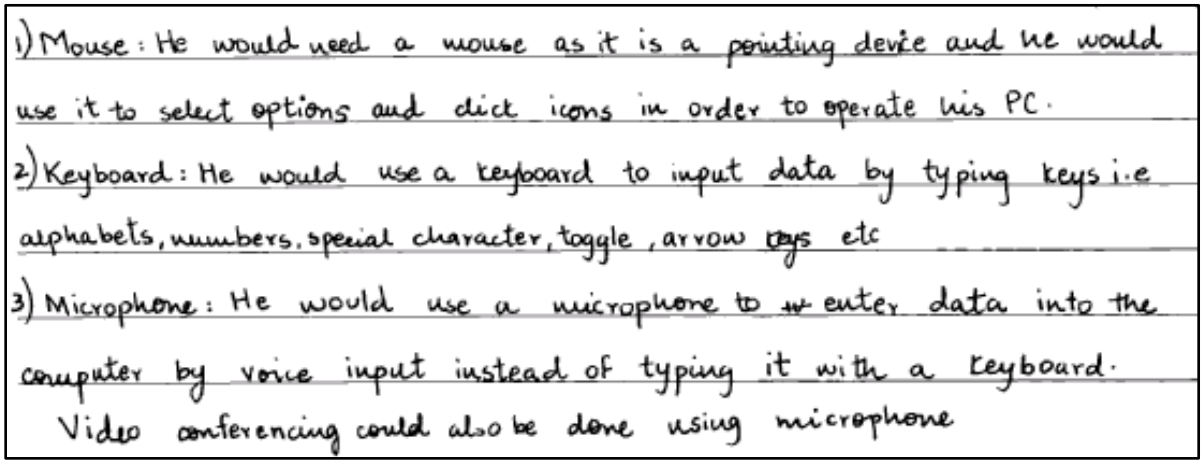
The parents of a school student offer him a new personal computer system. You are asked to help him select the input devices. Select any THREE input devices and give reasons for selecting each.

Better responses wrote the names of input devices and reasons for choosing them as given in the table.

Input Devices	Reason for Selection
Keyboard	It is used to enter / input/ insert data or text or typing documents and commands
Mouse	It is used for pointing icons on screen/ selection/ moving cursor/drawing objects
Joystick	It is used to play games/ it is a pointing device.
Touch Screen	It is used for selection of screen objects, menus and options.
Scanner	It is used to convert text into digital form or image into digital form. changes in a hard copy is possible or change a hard copy into digital form
Microphone	It is used for communication or voice chat or for calls
Light Pen	It is used for drawings/ selecting screen objects for drawing images
Web Cam	It is used for communication or video conferences or capturing images
Track Ball	It is used as a pointing device/ it occupies less space or easy to use.

Most of the responses had chosen keyboard, mouse and joystick as input devices and written the reasons for choosing them. Candidates are advised to get familiar with other common input devices as well such as microphone, web cam, scanner, touch screen, etc.

Example:


1) Mouse : He would need a mouse as it is a pointing device and he would use it to select options and click icons in order to operate his PC.

2) Keyboard : He would use a keyboard to input data by typing keys i.e alphabets, numbers, special character, toggle, arrow keys etc

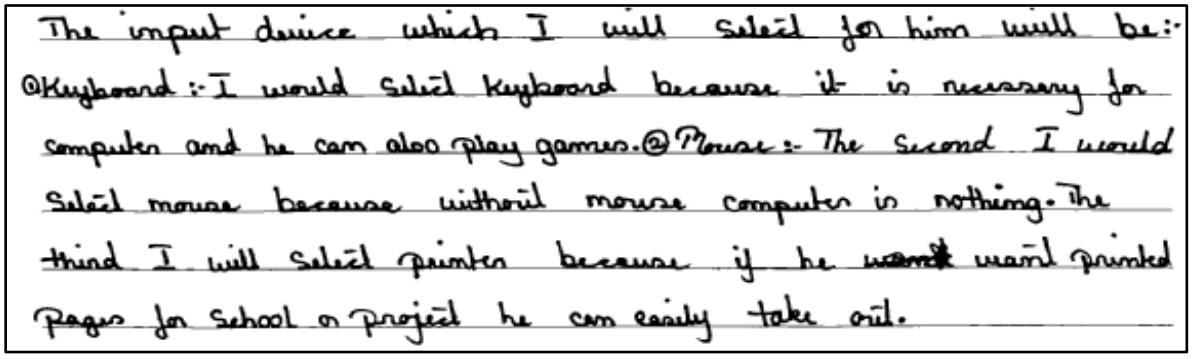
3) Microphone : He would use a microphone to enter data into the computer by voice input instead of typing it with a keyboard.

Video conferencing could also be done using microphone

Weaker responses mostly wrote names of output devices along with those of input devices such as printer, monitor, speaker, RAM, ROM and processor. Furthermore, these responses were not able to write correct reasons for selecting these devices. However, most of these responses had written the correct reason of selection of joystick. The table below shows some weaker responses of candidates.

Input Devices	**Reason for Selection**
Keyboard	It is necessary for computer or it is important for a computer
Mouse	Without a mouse computer is nothing
Joystick	Mostly answers are correct
Touch Screen	Used to play games
Scanner	Through scanners information, pictures are saved in a computer
Microphone	To hear sound, music
Light Pen	It is used to play video games
Web Camb	Very important for a computer system
Track Ball	Very few responses but all are correct

Example:

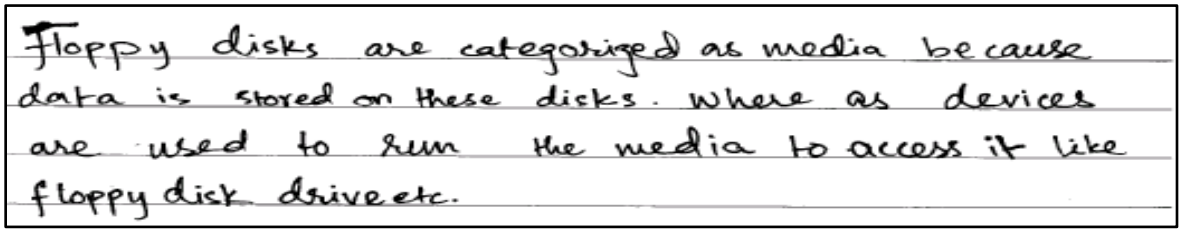

The input device which I will select for him will be:- @Keyboard :- I would select keyboard because it is necessary for computer and he can also play games. @Mouse :- The second I would select mouse because without mouse computer is nothing. The third I will select printer because if he wants hard printed Pages for school or project he can easily take out.

Question 2b

Are floppy disks categorized as media or as devices? Give a reason to support your answer.

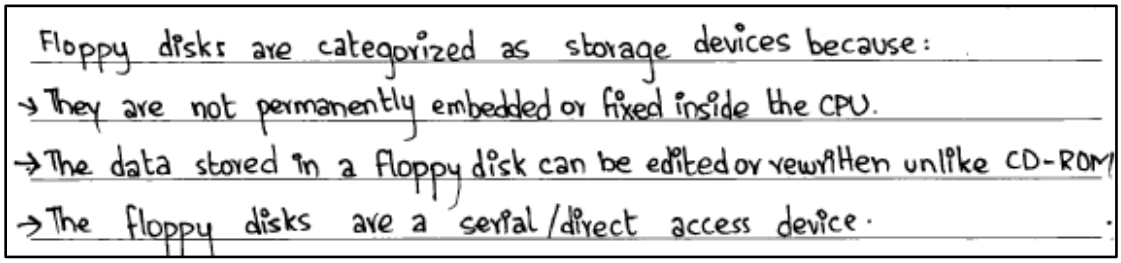
Better responses stated that floppy disks are categorized as storage media because floppy disk is a material on which data are written or stored.

Example:


Floppy disks are categorized as media because data is stored on these disks. Where as devices are used to run the media to access it like floppy disk drive etc.

Weaker responses stated that a floppy disk is a storage device as well as storage media. Moreover, such responses also identified a floppy disk as storage device only. Although, they have stated the reason of storage media correct but due to mentioning it as storage device they lost marks.

Example:



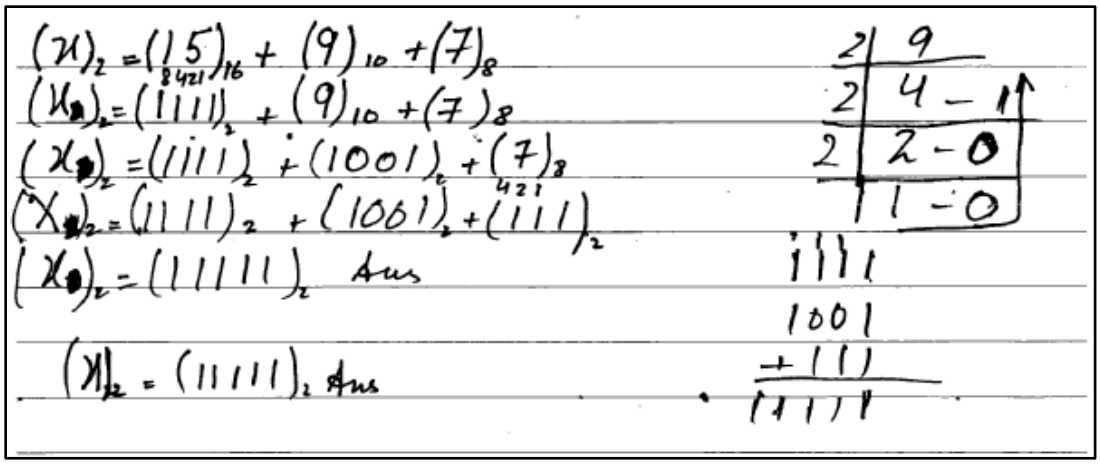
Question 3

Find the value of X in binary number system for the given expression. (Note: Show your working)

(X)2 = (F)16+ (9)10+ (7)8

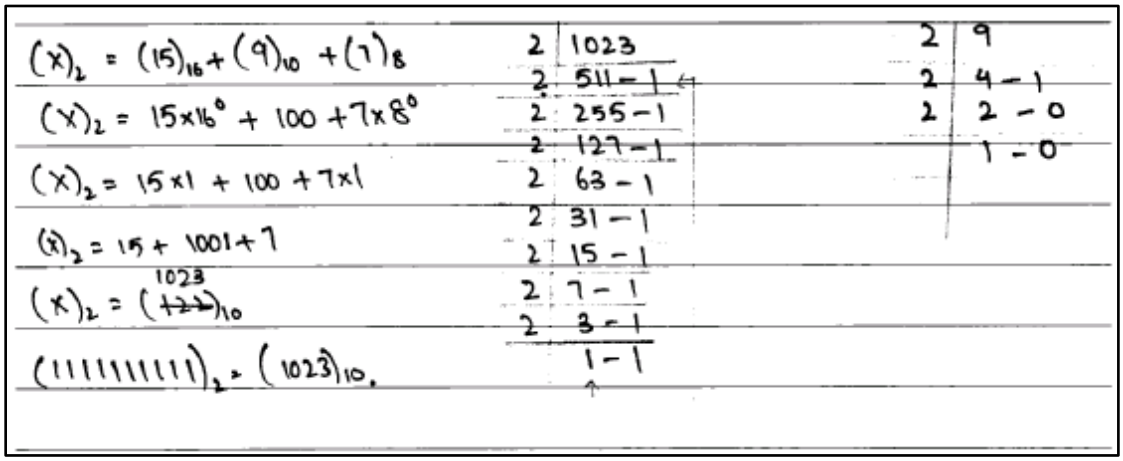
Better responses converted values given in each number system into binary and then added these binary values to calculate the final answer. Other such responses converted all the numbers from different number systems into decimal number system and then added all the numbers and finally converted the sum of all numbers into binary number system.

Example:



Weaker responses were mostly able to convert one or two numbers into binary system correctly but they either did not add these numbers or, if the addition was done, then it was done incorrectly.

Example:

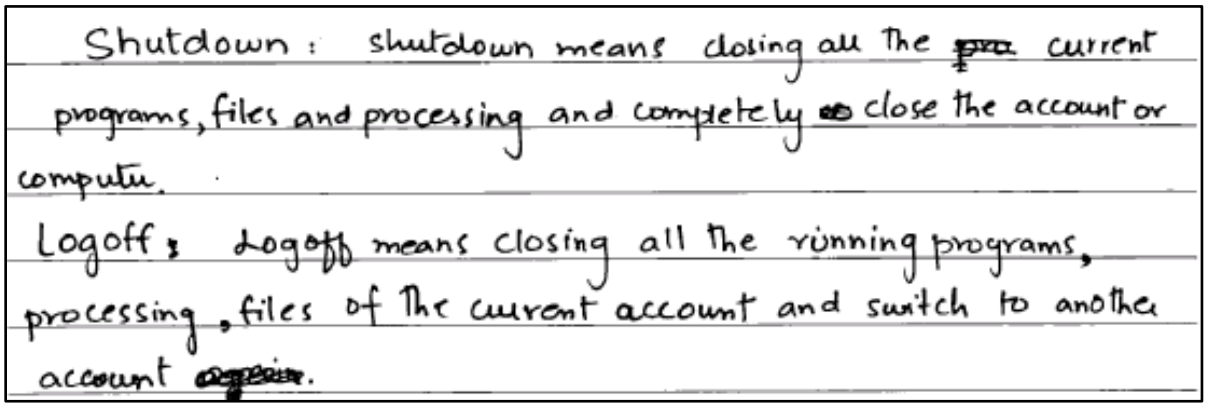


Question 4a

Differentiate between log off and shutdown options in MS Windows.

Better responses correctly wrote that when a user logs off from Windows, all the programs they were using are closed but the computer is not turned off/ this makes the computer available for another user to login without needing to re-start the computer/ CPU does not turn off or stop/ CPU is working partially/ electrical busses are still active in log off/ current account can be closed and another user can work on his account/ operating system is active/ running or active files are closed.
Likewise, these responses further stated when a user clicks shutdown, then his computer closes all open programs along with Window itself, and then completely turns off the computer and display/ computer is turned off completely.

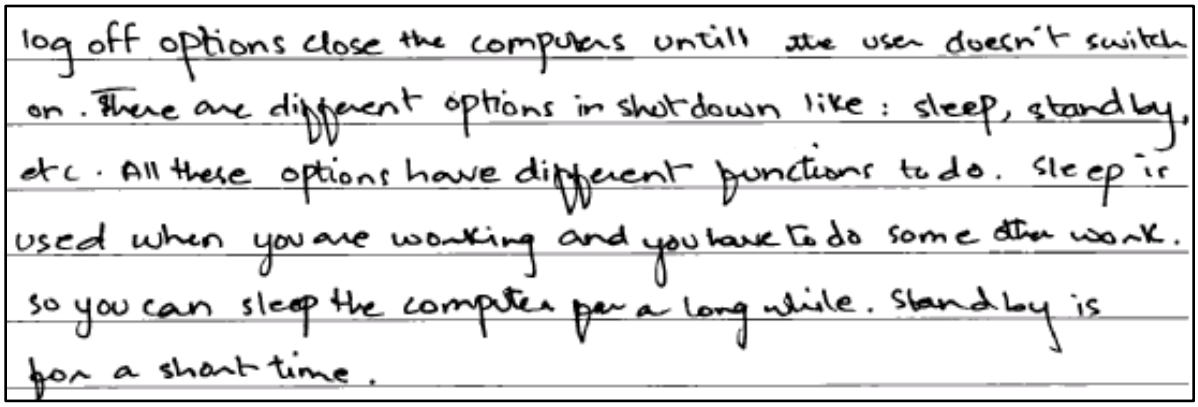
Example:


Shutdown : shutdown means closing all the current programs, files and processing and completely close the account or computer.

Logoff : Logoff means closing all the running programs, processing, files of the current account and switch to another account.

Weaker responses wrote very generalised differences between log off and shut down. For instance, computer is off in log off for short period of time and in shutdown it is off for long period of time/ in log off computer is closed until a user switches it on but in shut down computer sleeps or standby/ in log off, computer is not turned off but all programs are on but in shut down computer sleeps completely.

Example:

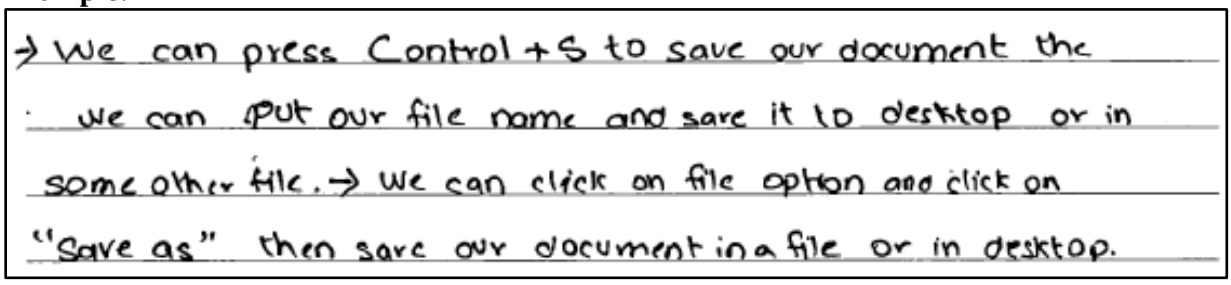

log off options close the computers untill the user doesn't switch on. There are different options in shutdown like: sleep, standby, etc. All these options have different functions to do. Sleep is used when you are working and you have to do some other work. so you can sleep the computer for a long while. Standby is for a short time.

Question 4b

Mention TWO ways for saving a document for the first time in MS Word.

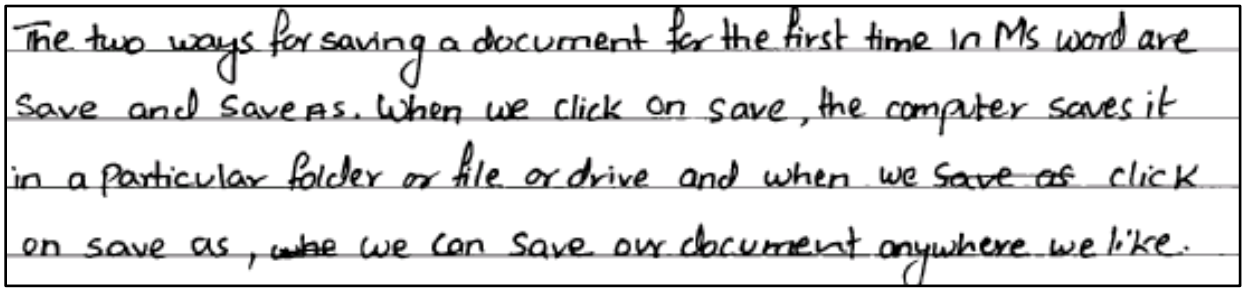
Better responses listed the ways of saving a document such as click **Save** on the Quick Access Toolbar/ press **CTRL + S**/ click on **Floppy button** on title bar/ close a document and it will ask to save it before closing or save automatically/ in file option, either use **Save as** or **Save**/ click on **Office Button** and then click Save or Save as.

Example:


→ We can press Control + S to save our document the
· we can put our file name and save it to desktop or in
some other file. → We can click on file option and click on
"Save as" then save our document in a file or in desktop.

Weaker responses wrote the ways vaguely, such as, go to save as options and write name of the document and press save/ go to DOS and write the specific command/ directly we can click on save as option for editing name or document type.

Example:

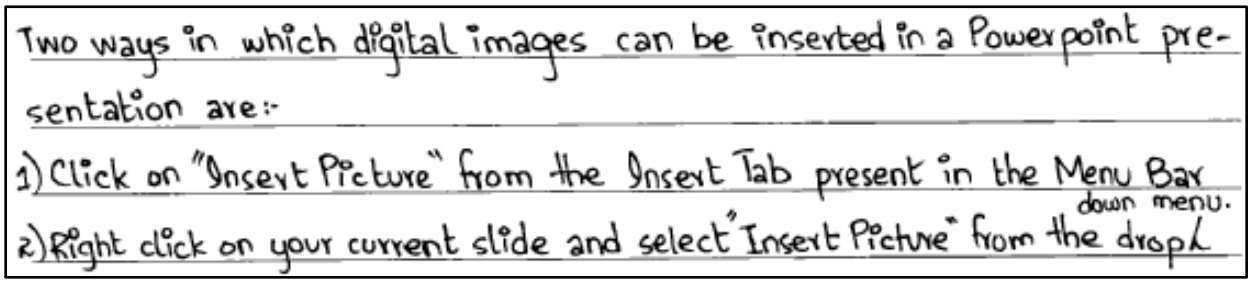

The two ways for saving a document for the first time in Ms word are Save and Save As. When we click on save, the computer saves it in a particular folder or file or drive and when we Save as click on save as, ~~whe~~ we can save our document anywhere we like.

Question 4c

Images can be captured with a digital camera. Describe TWO ways in which digital images can be inserted in a presentation.

Better responses had written the ways including click on insert, picture, from file/ click on insert, photo album, and new photo album/ open and select the picture using any graphic software, copy and paste/ click picture button in status bar or formatting bar then right click on slide and select insert picture/ we can copy image from digital camera memory card and paste it into the slide of presentation.

Example:

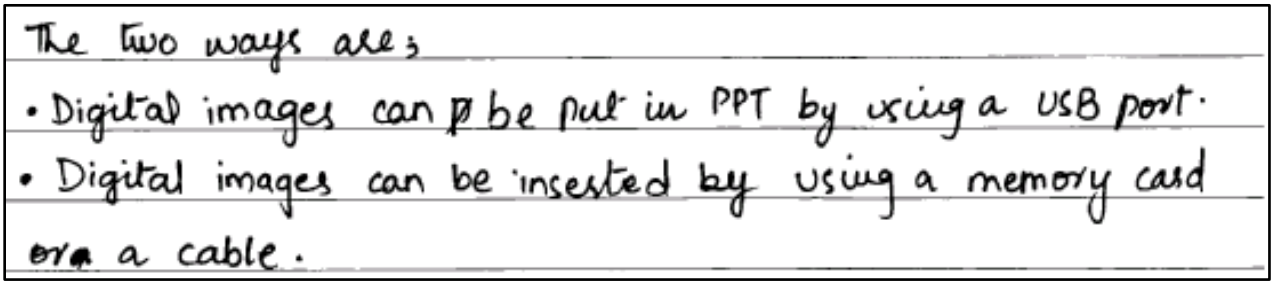

Two ways in which digital images can be inserted in a Powerpoint presentation are:-

1) Click on "Insert Picture" from the Insert Tab present in the Menu Bar

2) Right click on your current slide and select "Insert Picture" from the drop down menu.

Weaker responses mostly stated that images can be put in PPT by using a USB port or memory card or a cable in a presentation which is absolutely wrong.

Example:


The two ways are;
• Digital images can be put in PPT by using a USB port.
• Digital images can be inserted by using a memory card or a cable.

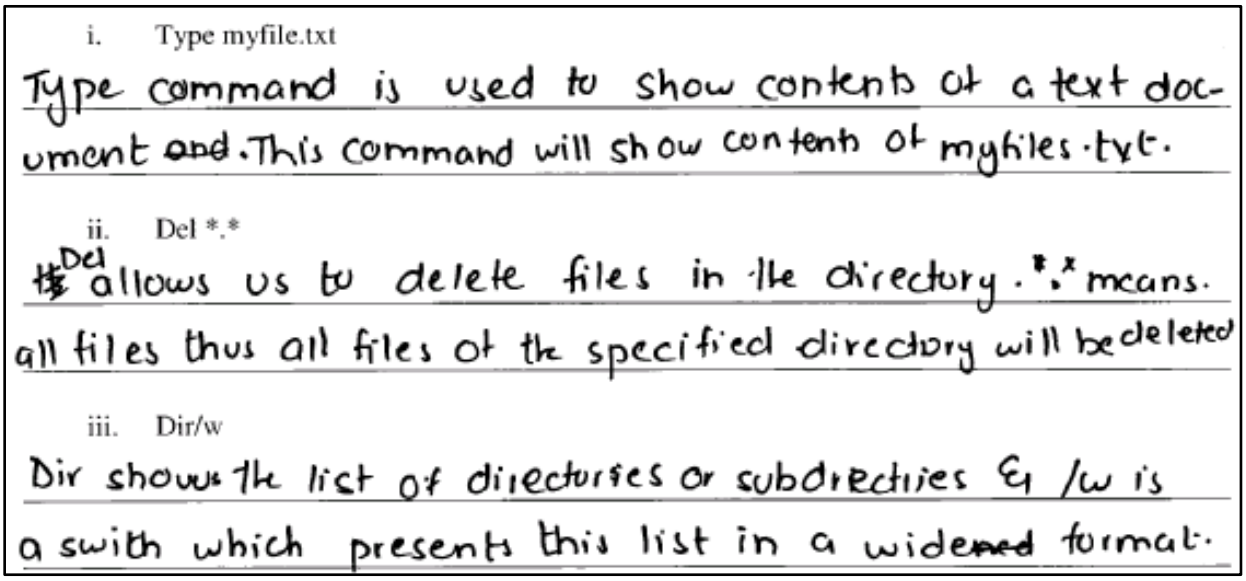
Question 5a:

State the purpose of the following DOS commands.

(i) Type myfile.txt
(ii) Del *.*
(iii) Dir/w

Better responses wrote that **Type myfile.txt** displays the contents of the file "myfile.txt" on DOS prompt/ it opens myfile.txt or myfile/ it opens text file named as myfile.
Moreover, these responses also stated that **Del*.*** deletes all files present in a directory/ it deletes all files/ it deletes all files, not a file or not directories or sub directories.
Likewise, these responses had also written that **Dir/w** displays the list of files and directories in wide format/ it displays the list of files and directories in horizontal format/ it displays the list of files and directories in width format or in horizontal way.

Example:

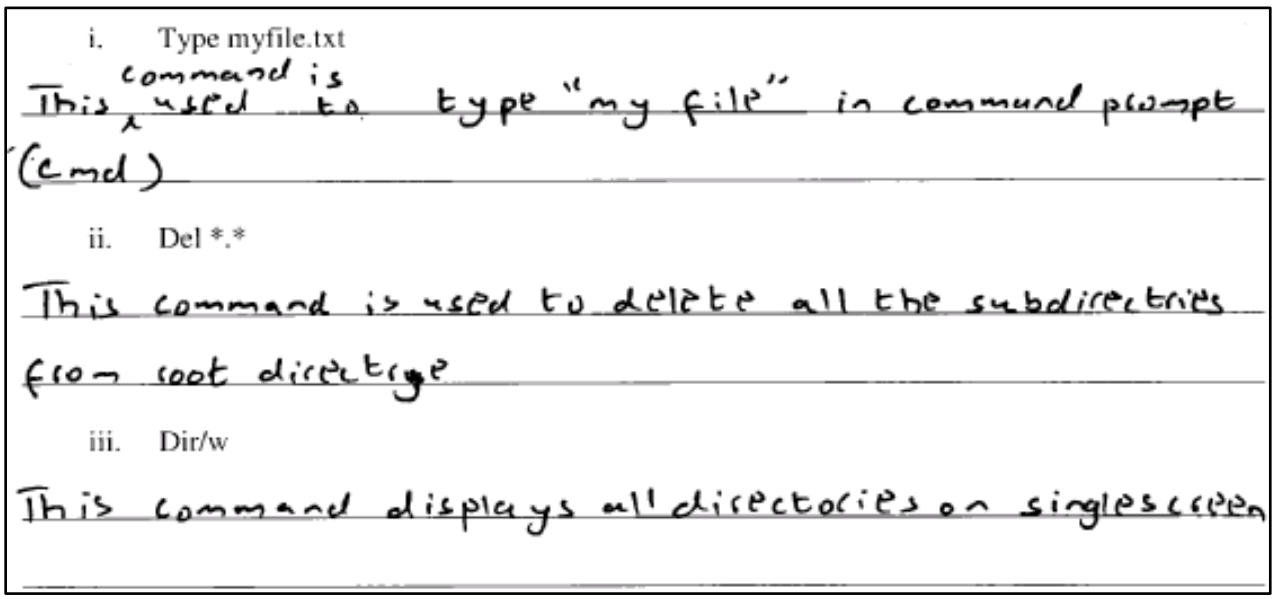

i. Type myfile.txt
Type command is used to show contents of a text document and. This command will show contents of myfiles.txt.

ii. Del *.*
Del allows us to delete files in the directory. *.* means all files thus all files of the specified directory will be deleted

iii. Dir/w
Dir shows the list of directories or subdirectories & /w is a swith which presents this list in a widened format.

Weaker responses mostly wrote that **Type myfile.txt** is used to type or write a text file. Moreover, these responses also stated that **Del*.*** is used to delete directories or sub directories. Likewise, these responses had also written that Dir/w shows path of directory in W drive.

Example:


i. Type myfile.txt

This command is used to type "my file" in command prompt (cmd)

ii. Del *.*

This command is used to delete all the subdirectories from root directory

iii. Dir/w

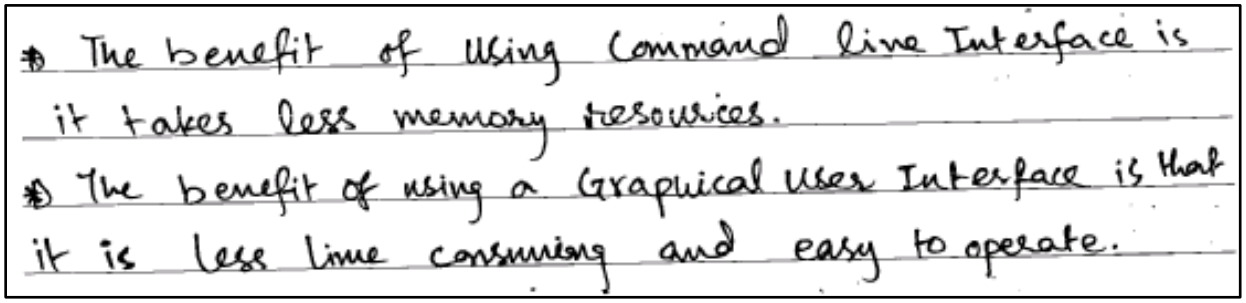
This command displays all directories on single screen

Question 5b:

There are two types of user interface in operating systems. Graphical User Interface (GUI) and Command Line Interface (CLI). Write ONE benefit of using each type of interface.

Better responses wrote benefits of GUI such as graphical user interface is attractive/ a task can be done in several ways/ it is simple and less time consuming/ it is user friendly/ it is WIMP (Windows, Icons, Menu, Pointer) based interface. Also, these responses stated benefits of CLI, i.e. typing a short command is faster than clicking several icons and menus/ it uses less memory.

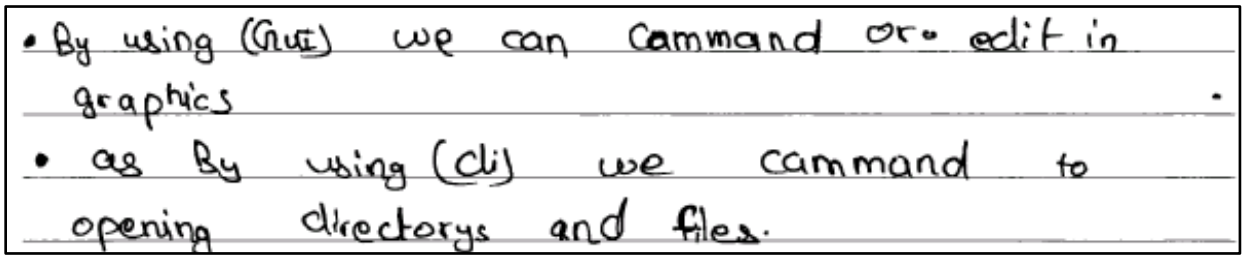
Example:


* The benefit of Using Command line Interface is it takes less memory resources.

* The benefit of using a Graphical User Interface is that it is less time consuming and easy to operate.

Weaker responses were not able to write appropriate benefits of GUI; for instance, GUI is general purpose/ makes the work in more creative way/ we can edit graphics by using GUI. However, most of these responses either had not written any benefit of CLI or, if they had written about CLI, then it was not something which could be considered as a benefit; for example, CLI is used to type commands/ we write commands in CLI to open directories and files/ it is easy to operate and learn for the user.

Example:



Extended Response Questions (ERQs)

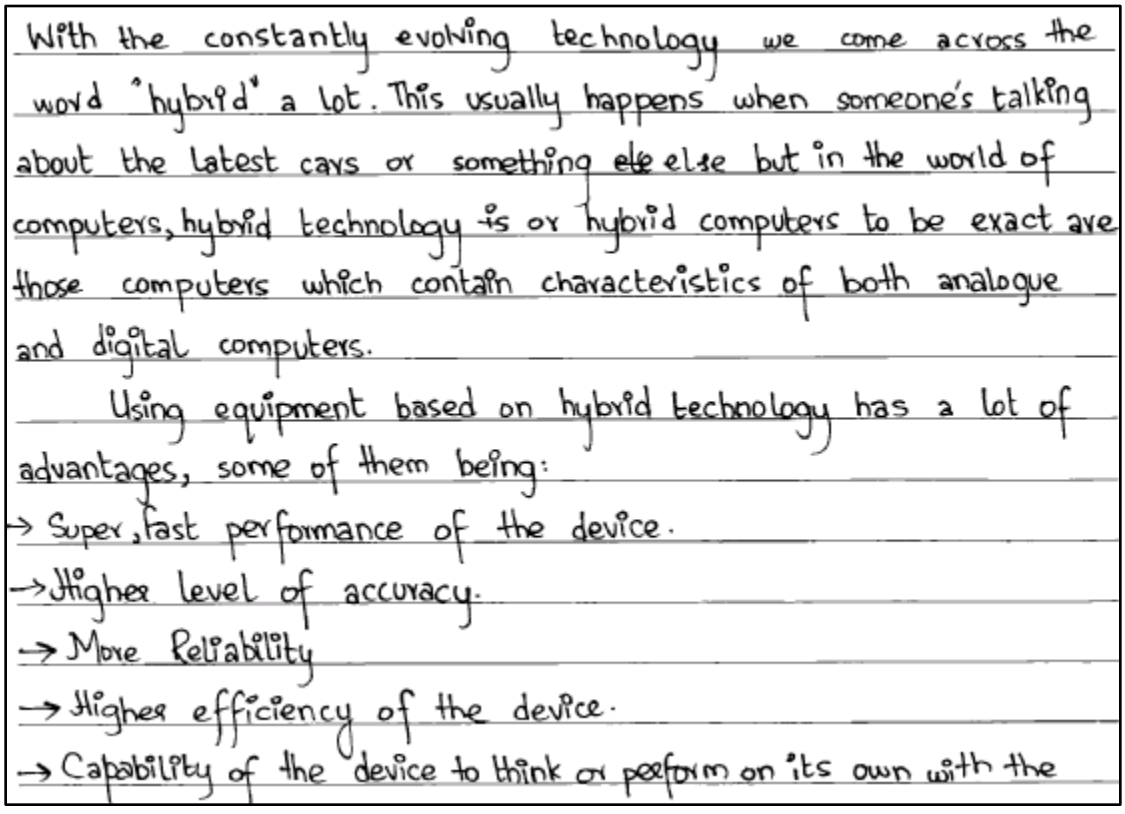
The following questions offered a choice between part **a** and **b**.

Question 6a

Describe the advantages of using equipment based on hybrid technology. Give TWO examples of hybrid devices.

Better responses stated the advantages of using equipment based on hybrid technology including they are fast/ they consume less time/ they are accurate/ they hardly display error/ they can handle sensitive data/ they are easy to manage/ they are user-friendly/ they work on both digital and analogue data/ they can store large amount of data/ they are special purpose computers/ their output is easily readable/ special purpose computers based on detectors and sensors/ they are reliable and efficient. Moreover, these responses also stated examples of hybrid devices such as petrol pump machine calculates the amount according to the amount of petrol input/ a digital sphygmomanometer displays blood pressure in digits without any observation of mercury or needle movement/ they are used in radar, hybrid cars, ICU devices, watch or clock, telemetry, etc.

Example:



With the constantly evolving technology we come across the word "hybrid" a lot. This usually happens when someone's talking about the latest cars or something ~~else~~ else but in the world of computers, hybrid technology is or hybrid computers to be exact are those computers which contain characteristics of both analogue and digital computers.

Using equipment based on hybrid technology has a lot of advantages, some of them being:

→ Super, fast performance of the device.

→ Higher level of accuracy.

→ More Reliability

→ Higher efficiency of the device.

→ Capability of the device to think or perform on its own with the

advent of artificial intelligence and programmable sensors ~~with~~ which make the device a smart device.

Some examples of devices using ~~hyy~~ hybrid technology:-

→ cardiograms (monitoring a patient's heartbeat in hospitals)
→ seismographs (device taking readings for intensity of earthquakes)
→ guided missiles
→ satellites
→ radar systems.
→ hybrid technology is also used in telemetry
→ spaceships.
→ robots

Weaker responses mostly stated this same advantage, i.e. hybrid technology can work with both digital and analogue data, repeatedly while attempting this question. Apart from this, these responses were hardly able to write any other appropriate advantage. Likewise, these responses were not able to write the examples of hybrid devices or, if they wrote, then these examples were wrong; for example, hybrid technology is used in home computers like in PC's and mobile phones.

Example:

Advantages:-

(a) 1 Compass is Used Forgetting help to find Correct direction.

2 Metres is Used to check the rate of bills, Car metres to shows the Current km.

3) Hybrid Uses in Computer es. These Computers are very different from others. It helps in different fields of life.

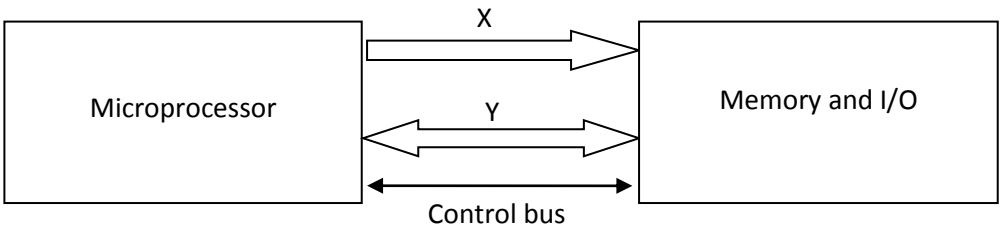
4) Hybrid Uses in home appliances. It helps to make womens work more easier.

5) Hybrid Uses in watches. The hybrid watches are very Powerful it shows the time in both analog and digital way. It makes our life Style easy & Comfortable.

Example:-

1: Compass 2: Metres.

Question 6b



A 'bus' is basically a communication link between the processing unit and the peripheral devices. It is a group of wires that carry information in the form of bits.

i. Describe ONE characteristic and ONE function of X and Y.
ii. Identify the missing buses X and Y in the given diagram.
iii. What is the role of a microprocessor in a computer system?

Better responses correctly identified the bus X as address bus and Y as data bus. These responses also stated one correct feature and function for both, address and data bus. Most of these responses wrote about the function and characteristics of address bus such as it is unidirectional/ it is used by the CPU to send out the address of the memory location to be accessed/ it is also used by the CPU to select a particular input or output port/ it may consist of 8, 16, 20 or an even greater number of parallel lines/ the number of bits in the address bus determines the maximum number of data locations in the memory that can be accessed; a 16-bit address bus, for instance, can access 216 data locations.

Moreover, most of these responses wrote about the function and characteristics of data bus such as it is bidirectional, that is, data flow occurs both to and from the microprocessor and peripherals/ the data bus transfers actual data/ this is a bus that connects all the internal computer components to the CPU and main memory/ the size of the data bus determines the largest number that can be processed by the microprocessor in a single operation.

Likewise, these responses stated that a microprocessor is a computer processor that incorporates the function of a computer's central processing units on a single integrated circuit or at most a few integrated circuits/ it converts data into information/ it controls Input & Output (I/O) devices and processes data/ it performs arithmetic logic operations.

Example:

Bus is a set of several parallel wires that provide communication links.

i) X is an address bus and Y is a data bus.

ii) X i.e an address bus :-

a) Connects CPU with memory and carries memory addresses.

b) No. of lines in an address ~~bat~~ bus tells the maximum number of memory addresses that is it can carry. If it has 6 lines that it can carry addresses of $2^6 = 64$ bytes of memory. ~~add~~

Y i.e data bus :-

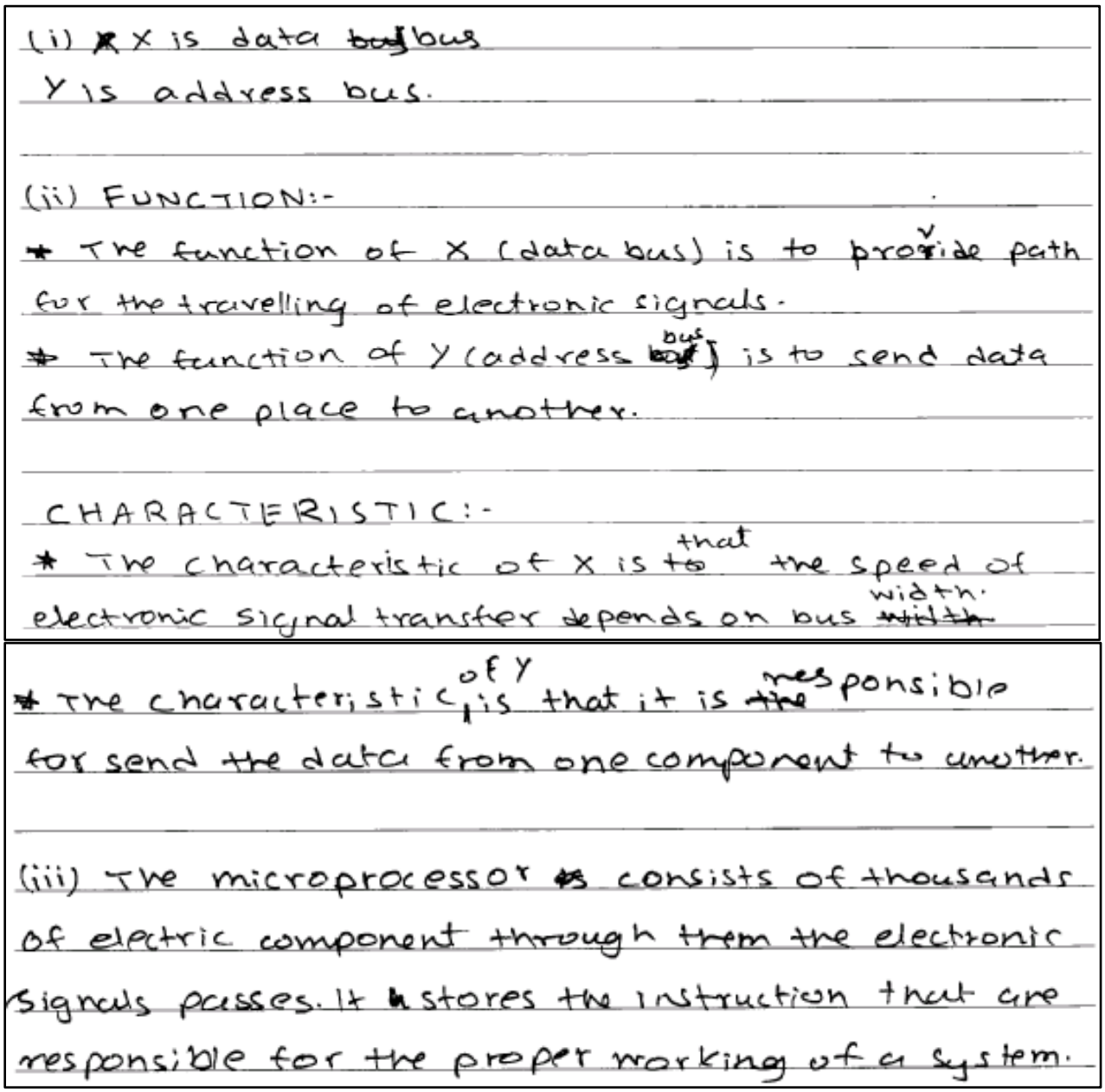
a) Connects CPU with memory and other hardware devices on the motherboard. It is a communication link that connects the peripheral devices with the CPU. It is the computer's common electrical bus.

b) No. of wires on the data bus ~~tf~~ tell the speed at which data will travel among different units of the computer and at which CPU will process data.

iii) Microprocessor is actually the Central Processing Unit. It is the brain of the computer and controls the entire computer system. It executes the ~~i~~ instructions given to it and also makes use of the peripheral devices.

Weaker responses depict that most of the candidates were not able to understand the diagram properly because they were not able to identify X as address bus and Y as data bus. Instead of that they identified these buses vice versa. These responses also showed lack of understanding to differentiate between function and characteristic and most of these responses had written the function and characteristics of control bus which is not asked in the question. Moreover, these responses penned very general information about processor using non-technical language, which is not advised at SSC level.

Example:



(i) X is data bus
Y is address bus.

(ii) FUNCTION:-
* The function of X (data bus) is to provide path for the travelling of electronic signals.
* The function of Y (address bus) is to send data from one place to another.

CHARACTERISTIC:-
* The characteristic of X is that the speed of electronic signal transfer depends on bus width.

* The characteristic of Y is that it is responsible for send the data from one component to another.

(iii) The microprocessor consists of thousands of electric component through them the electronic signals passes. It stores the instruction that are responsible for the proper working of a system.

Question 7a

Utility software, along with operating system 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.

i. Name any FOUR utility software/ programs.
ii. Describe the purpose of each utility software/ program that you have mentioned in part i.

Better responses wrote correct names of utility software along with appropriate purpose of each. The names and purpose of corresponding utility software written by these responses are shown in the table.

Utility Program	**Purpose**
File sorting	Sort files by date, type, size etc
File renaming	Rename existing files
File conversion	e.g. convert a sound file to MP3
File transfer	move, copy, delete files
Diagnostic tools	Test the system to see if any problems
Defragmentation	Reorder the files on the hard disk to make them contiguous (next to one another)
Disk formatting	preparing the disk to store files
System information	a record of all the hardware and details of operating system
Anti-virus	Checks files before opening for viruses. Performs scans of system
Backup	Performs data backups at regular times
System cleanup tools	Removes old installation details, temporary files and dead shortcuts

Example:

i) FOUR Utility Programs/softwares are:-
① BackUpMy PC.
② WinRAR
③ Disk Repair
④ Norton Antivirus.

ii) Purposes of each Utility Programs/Softwares:

① BackUpMyPC:- This is a program/software which is used to regain the lost files or deleted files. If we have deleted a software, file, folder, document which should not be deleted. For that purpose this program is used to bring that files back.

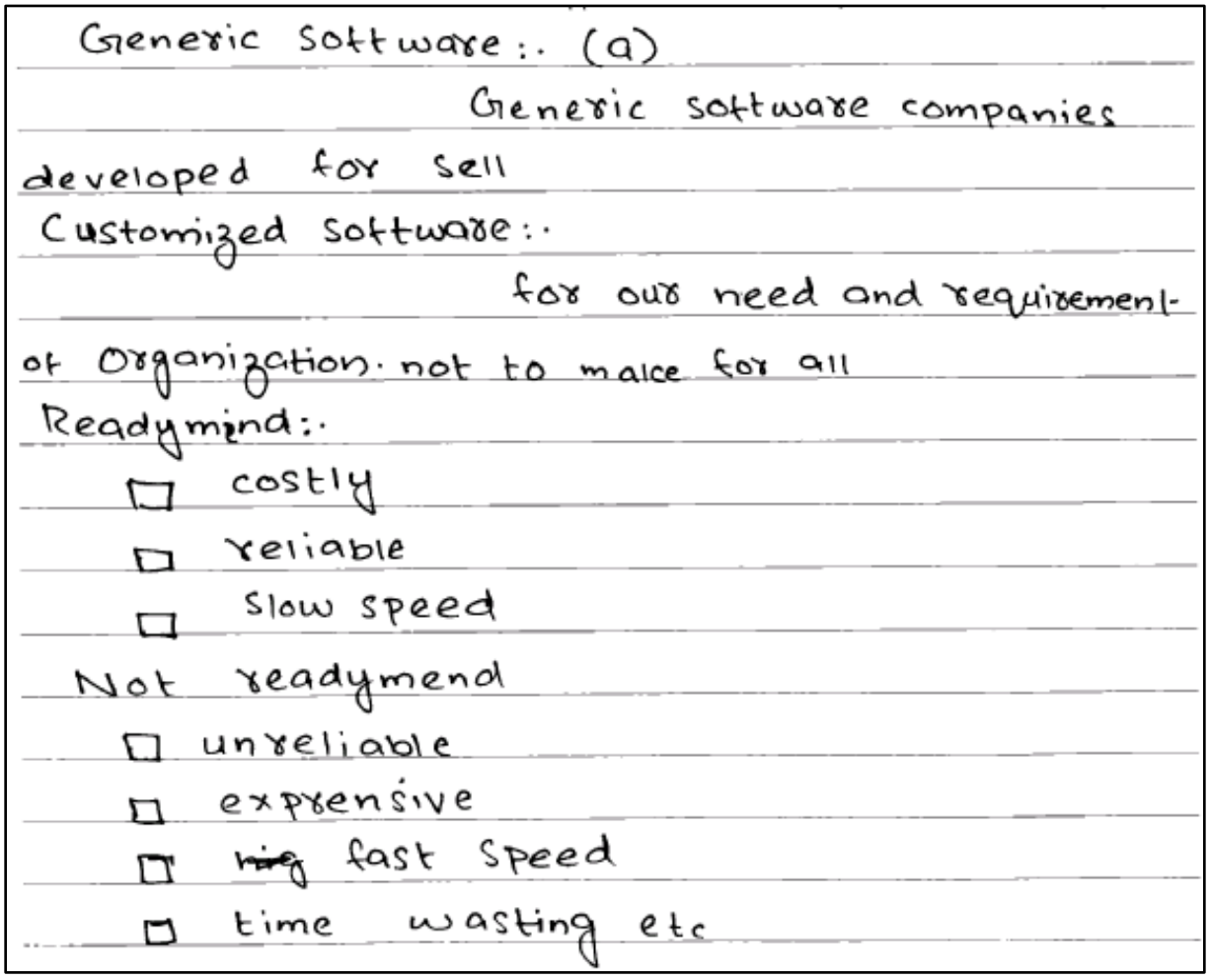
② WinRAR:- Some times we have a lot of files and folders and we want to make them in single file. For that purpose we can use WinRAR program/software to decrease the number of files by merging them into single one.

③ DiskRepair:- In our PC's our disk get many viruses by USB's and other source. For that purpose DiskRepair software is used. It can also be used for USB's as well as hard disks.

④ Antivirus (Norton Antivirus):- It is the software or program used when the computer got viruse from any source. It is used for the detection of viruses and to scan the file, folder and disk sometimes. Search for

Weaker responses confused generic software with application software and were not able to write correct names of utility software; for instance, these responses wrote utility software names such as business software, system software, notepad, customization software and so on. Also, these responses were not able to write appropriate purpose of listed utility software. Instead they had written very general advantages of these software, such as, reliable, fast, user-friendly and so on.

Example:


Generic software :. (a)

Generic software companies developed for sell

Customized software :.

for our need and requirement- of Organization. not to make for all

Readymind :.

- ☐ costly
- ☐ reliable
- ☐ slow speed

Not readymend

- ☐ unreliable
- ☐ expensive
- ☐ ~~nig~~ fast speed
- ☐ time wasting etc

Question 7b

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

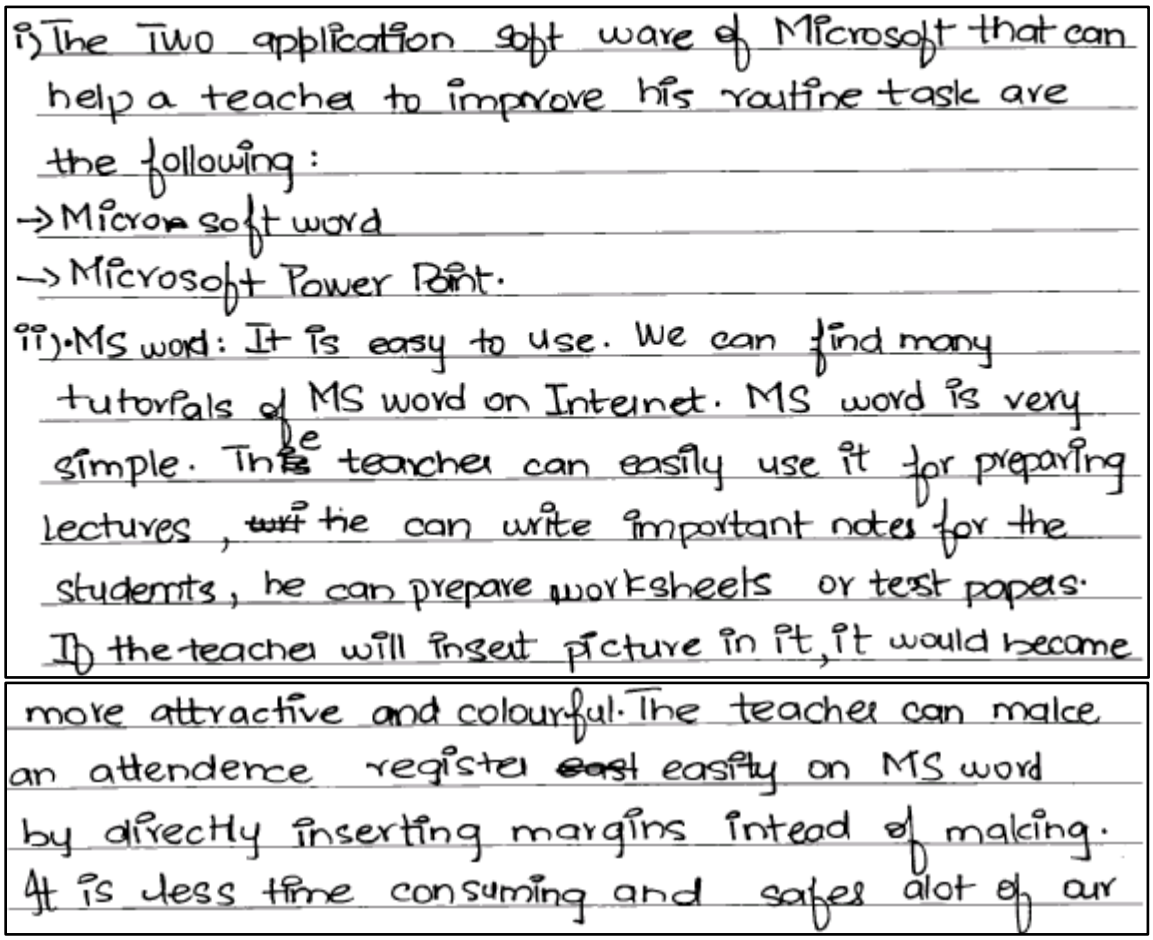
ii. Describe THREE features of each application software that you have mentioned in part i.

Better responses wrote the names of MS Words, PowerPoint and Excel and stated the appropriate features of each; for instance, **Microsoft Excel** can help teacher to manipulate data by using formulas/ to analyze data using visual graphs, charts, tables/ sort information quickly and easily using improved data filters/ to monitor student progress and keep a close eye on individual achievements/ use pre-designed grade-book templates to track student grades/ view collected data in a more understandable way/ manage subject material with more flexibility.

Similarly, **Microsoft Word** can be used for creating worksheets/ creating notes/ writing letters/ writing memos/ creating permission slips/ creating student reports/ making school news letters or newspapers/ creating tables/ inserting pictures into existing documents/ creating charts/ inserting different shapes and equations and so on.

Likewise, **PowerPoint** can be used to enhance teacher presentations and the overall comprehension of students/ it is a program that allows teachers to present their lessons in a more dynamic way than simply lecturing and writing on the blackboard/ make the presentation more attractive/ it provides the ability to equip the presentations with different types of media including images, sounds, animations, and much more.

Example:


i) The two application soft ware of Microsoft that can help a teacher to improve his routine task are the following:
-> Microsoft word
-> Microsoft Power Point.
ii) • MS word: It is easy to use. We can find many tutorials of MS word on Internet. MS word is very simple. The teacher can easily use it for preparing lectures, he can write important notes for the students, he can prepare worksheets or test papers. If the teacher will insert picture in it, it would become more attractive and colourful. The teacher can make an attendence register easily on MS word by directly inserting margins intead of making. It is less time consuming and safes alot of our

Most of the *weaker responses* ignored the condition given in the question, i.e. they had to write names of any two MS software. A number of these responses, surprisingly, wrote irrelevant names such as, business software, education software, etc. Candidates are strongly advised to read and understand the question and attempt it as per the given criteria. If they were able to identify the software correctly, then such responses wrote very general features of MS Word, PowerPoint and Excel which were not relevant to the scenario given in question, i.e. how it can help a teacher to improve his routine tasks such as preparation of lecture, report cards, attendance registers and time table.

Example:

b.i. Application software that can help teacher to improve his routine tasks such as preparations of lectures, report cards, attendance registers and time-table are as follow:

- Productivity Software.
- Education Software.

ii. ~~Prod~~ Features of Productivity software:

Productivity software includes database from which a teacher could manipulate a text document. It is properly documented. Spreadsheet in productivity software will help teacher to make report cards. There is a browser as well which will help teacher in preparing lectures as it has the ability to connect the user with the internet. It lets you to visit different websites.

In developing productivity softwares, is very expensive and may disturbs the person's budgets but it is very useful. It is efficient in speed and storage.

Features of Education Software

Application software is very useful in educating students.

- It ~~mak~~ helps students in better understanding, faster learning, and broaden our thinking.
- It increase the knowledge of the students as there are pictures and graphics.
- It is very fast and helpful.

Application software are properly documented. But developing an application software takes a lot of time and needs many labours.

It is also useful in doing our business work but it is little expensive.