Aga Khan University Examination Board

Notes from E-Marking Centre on HSSC-I Computer Science Examination April/ May 2019

Introduction

This document has been produced for the teachers and candidates of Higher Secondary School Certificate (HSSC-I) Computer Science. It contains comments on candidates' responses to the 2019 HSSC-I Examination, indicating the quality of the responses and highlighting their relative strengths and weaknesses.

E-Marking Notes

This document 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 output devices, operating systems, computer networks, computer aided design (CAD), features of word processor, computer architecture and computer crimes were well attempted. However, questions based on storage capacity, data transmission, MS Word, spreadsheet (MS Excel) and data protection rules were generally not well attempted.

Detailed Comments:

Constructed Response Questions (CRQs)

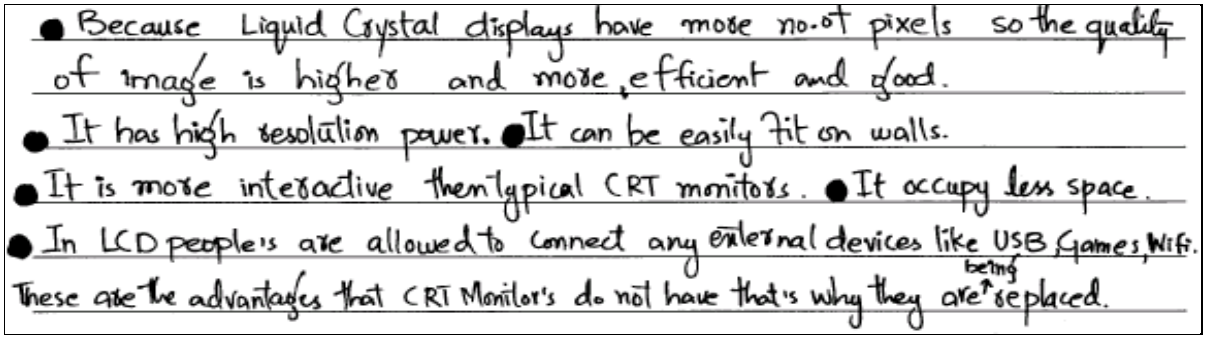
Question 1a:

Cathode Ray Tube (CRT) monitors are being replaced by Liquid Crystal Display (LCD) monitors in homes and offices.

Write any THREE reasons to justify the given statement.

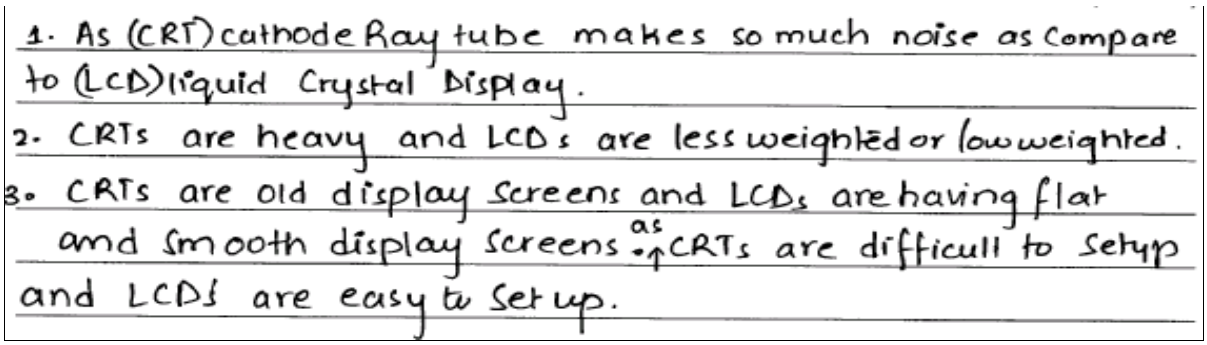
Better responses depicted good understanding of CRT and LCD monitors and they justified the statement given in the question with valid reasons, for instance: LCD has better quality (resolution) of image than CRT monitor; LCD occupies less space than CRT monitor; LCD can be easily mounted on the wall than CRT monitor; LCD allows connectivity of external devices such as flash drive but CRT does not provide such connectivity; LCD provides more interactive interface than CRT; LCD weighs less than CRT monitor.

Example:



Weaker Responses showed poor understanding of CRT and LCD monitors due to which they were unable to justify the statement given in the question. These responses included: CRT are better than LCD monitors; CRT are slower than LCD monitors; LCD has good sound as compared to CRT monitors; LCD are easy to use as compared to CRT monitors; LCD produce less noise than CRT monitors; CRTs are old display screens while LCDs are new; CRT are difficult to setup as compared to LCD monitors.

Example



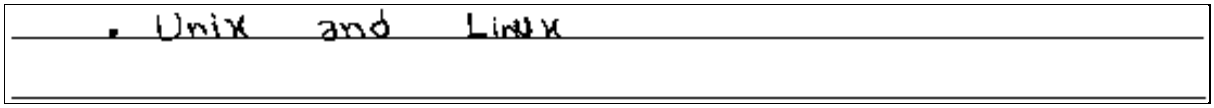
Question 1b:

Windows is the most commonly used operating system around the world. However, some other operating systems also exist.

List the names of any TWO operating systems other than Windows operating system.

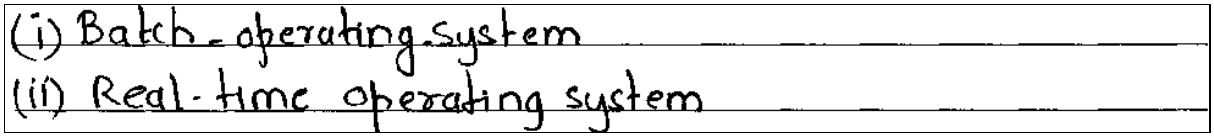
Better responses showed a good basic knowledge about the operating systems and listed names of the two operating systems, other than Windows, correctly. They listed names such as: UNIX; LINUX; DOS (Disk Operating System); iOS.

Example:



Weaker responses did not understand the demand of the question and failed to list the names of operating systems other than Windows. They listed names such as: compiler; interpreter; batch-operating system; real-time operating system; Windows XP; BIOS; system software; application software.

Example:



Question 2a:

Identify whether each of the given characteristics in the table is of a dot matrix printer or a laser printer.

S. No.	Characteristic	Dot Matrix Printer/ Laser Printer
1.	It uses papers with small holes on each side to feed them in printer.	
2.	It is non-impact printer.	
3.	It prints an entire page at a time.	
4.	It is used when low quality prints are required at slow print rate.	

(**Note:** Most of the candidates managed to attempt this question correctly.)

Better responses showed in-depth understanding of the dot matrix and laser printers and identified the given characteristics correctly. These responses identified the first and fourth characteristics in the table as the characteristics of the dot matrix printer and the second and third characteristics in the table as the characteristics of the laser printer.

Example:

S. No.	Characteristic	Dot Matrix Printer/ Laser Printer
1.	It uses papers with small holes on each side to feed them in printer.	Dot Matrix
2.	It is non-impact printer.	Laser Printer
3.	It prints an entire page at a time.	Laser Printer
4.	It is used when low quality prints are required at slow print rate.	Dot Matrix

Weaker responses mostly depicted confusion between the characteristics of two printers and identified the characteristics of dot matrix printer as that of laser printer and vice versa. Some of these responses marked the symbols of tick and cross instead of writing the name of printer in front of characteristics given in the question that shows the lack of understanding of the question.

Example:

S. No.	Characteristic	Dot Matrix Printer/ Laser Printer
1.	It uses papers with small holes on each side to feed them in printer.	✗
2.	It is non-impact printer.	✗
3.	It prints an entire page at a time.	✓
4.	It is used when low quality prints are required at slow print rate.	✓

Question 2b:

Show whether the given statements are true or false with the help of working.

(**Note:** No marks will be awarded if working is not shown)

Statement	TRUE/ FALSE	Working
4 gigabytes capacity of Flash Drive is enough to store 130 sound files of size 50 megabytes each.		
A link having data rate of 8 megabits per second will transfer a video file of 10 megabytes in 10 seconds.		
A portable hard disk has 1.5 terabytes of capacity which is equal to 1500000 megabytes.		

Better responses demonstrated good understanding of conversion amongst the memory units. The candidates applied the concepts on each given problem to determine whether it is true or false and showed its working.

Example:

Statement	True/ False	Working
4 gigabytes capacity of Flash Drive is enough to store 130 sound files of size 50 megabytes each.	False	1 GB → 1024 MB 130 x 50 = 6500 4GB → 4096 MB
A link having data rate of 8 megabits per second will transfer a video file of 10 megabytes in 10 seconds.	True.	8 megabits = 1 mega byte 1 MB → 1 second 10 MB → 10 seconds.
A portable hard disk has 1.5 terabytes of capacity which is equal to 1500000 megabytes.	False.	1TB = 1024GB = 1048576MB 1.5TB = 1572864MB

Weaker responses failed to show the correct working to determine true and false statements. Most of these responses showed confusion amongst the conversion of memory units such as 1024 bytes = 10^{30} gigabytes, 1024 bytes = 10^{40} terabytes, 1 gigabyte = 10^2 and 1 terabyte = 10^5.

Example:

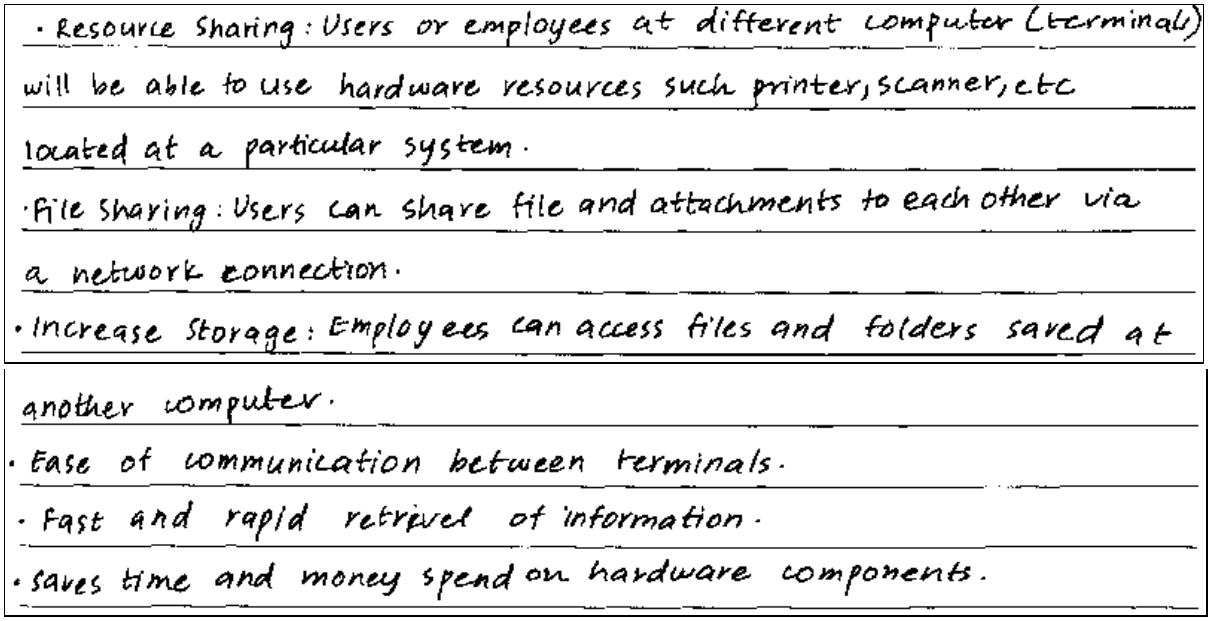
Statement	True/ False	Working
4 gigabytes capacity of Flash Drive is enough to store 130 sound files of size 50 megabytes each.	False	1 giga byte = 10^3 = 100
A link having data rate of 8 megabits per second will transfer a video file of 10 megabytes in 10 seconds.	False	becuse 8bits = 1byte. 8bits = 1 byte.
A portable hard disk has 1.5 terabytes of capacity which is equal to 1500000 megabytes.	True	1 terabyte = 10^5 = 100,000

Question 3:

Describe any FIVE advantages of setting up a computer network in an office.

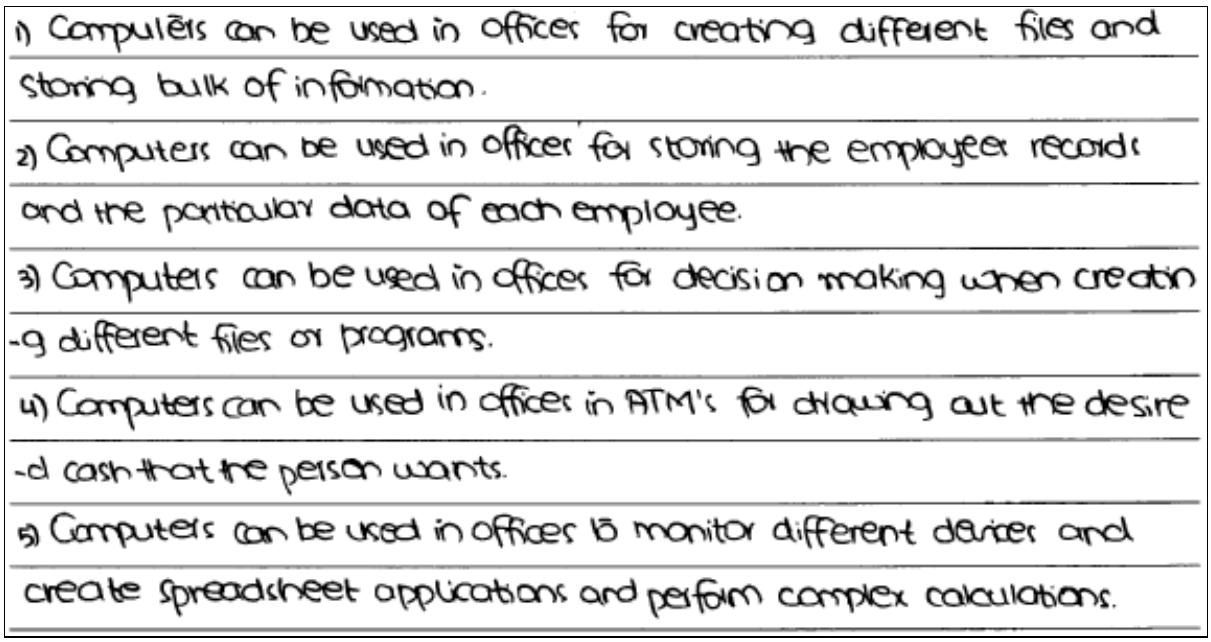
Better responses depicted a good understanding of the advantages of computer networks. The advantages written by these responses included: sharing peripheral devices; file sharing; cheaper software licenses for computer networks rather than for individuals; easy monitoring of work; data centeralisation; centralised management of network; easy backup and recovery; cost effective; fast retrieval of information; easy access to files and folders on other computers.

Example:



Weaker responses displayed that the candidates were unable to write the advantages of setting up a computer network in an office. Few of these responses were of the advantages of computers instead of computer networks: computers are used to create different files; computers are used to store bulk amount of data; computers are used for storing employees' records; computers are used for decision making in offices; computers are used in ATM machine of office; computers are used for complex calculations; computers are used to monitor various devices; computers work quickly and easily; it is easy to save records of profit and generate graphs with the help of computer; it is easy to manage the progress of workers with the help of computers; video conferencing can be done; salary of employees is easily managed.

Example:



Question 4:

Differentiate between Local Area Networks (LANs) and Wide Area Networks (WANs) on the basis of the features in the given table.

Feature	LAN	WAN
Speed		
Security		
Setup Cost		
Coverage Area		
Transmission Errors		

(**Note:** Most of the candidates performed well in this question.)

Better responses revealed that the candidates had good conceptual knowledge of the differences between LAN and WAN. Features written by these responses to differentiate between LAN and WAN included: speed is high in LAN and low in WAN; security is less in LAN and more in WAN; setup cost is low in LAN and high in WAN; coverage area is small in LAN and large in WAN; transmission errors are few in LAN and more in WAN.

Example:

Feature	LAN	WAN
Speed	more	less
Security	less	more
Setup Cost	less	more
Coverage Area	less	more
Transmission Errors	lesc	more

Weaker responses, mostly, differentiated between LAN and WAN on the basis of speed and coverage area correctly but failed to differentiate on the basis of security, setup cost and transmission errors.

Example:

Feature	LAN	WAN
Speed	Fast	Slow
Security	Secure	Unsecure
Setup Cost	expencive	inexpencive
Coverage Area	local area	wide geographical area
Transmission Errors	Have Chances	low Chances

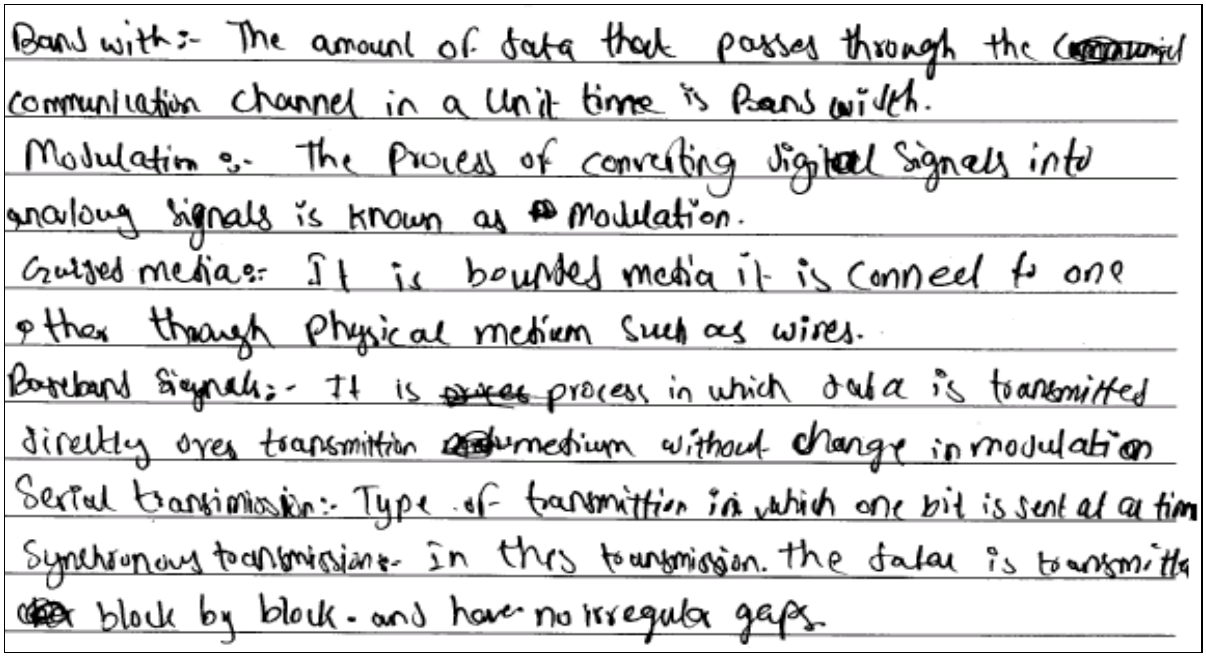
Question 5:

Define the following terms with reference to data transmission.

- Bandwidth
- Modulation
- Guided Media
- Baseband Signal
- Serial Transmission
- Synchronous Transmission

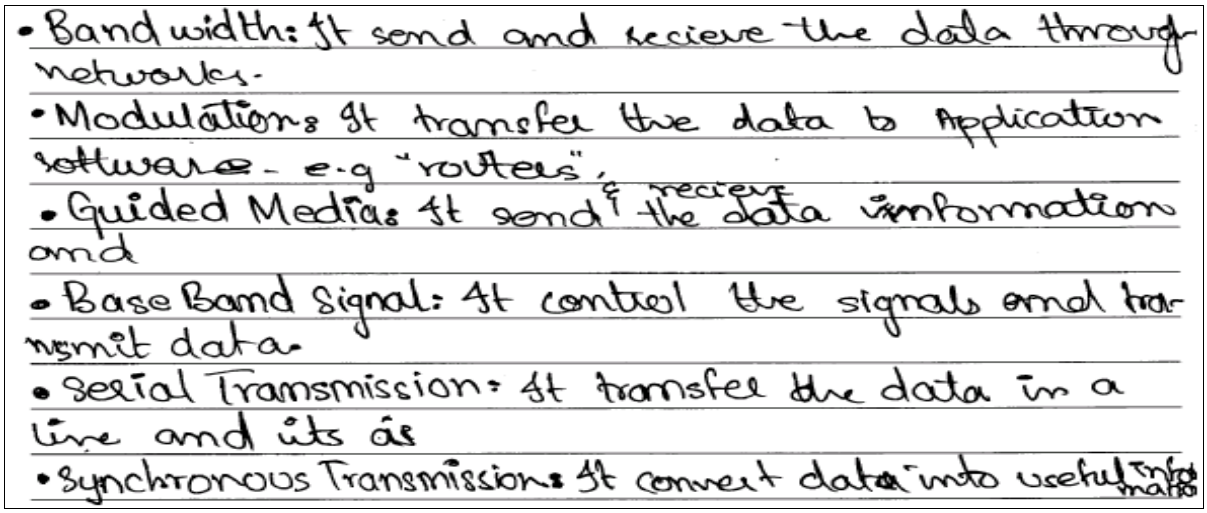
Better responses showed a good basic knowledge about the terminologies of computer networks. Definitions written by these responses included such as: Bandwidth is maximum capacity of a link to transfer data/ data transferring speed; Modulation is the process of imposing input signal on the carrier signal/ the process of converting digital signal into analog signal, guided media refers to the transfer of data via cable or physical path from sender to receiver; Baseband is original frequency range of a transmission signal/ it consists of frequencies that are near to zero/ low bandwidth signal/ signals sent by telegraph; Serial transmission is bit by bit transmission of data is called serial transmission; Synchronous transmission is a data transfer method in which continuous stream of signals is sent along with timing signals (clock signals)/ data is sent in the form of packets or blocks with clock signal.

Example:


Band with:- The amount of data that passes through the communication channel in a unit time is Band width.
Modulation :- The process of converting digital signals into analoug signals is known as Modulation.
Guided media:- It is bounded media it is connect to one other through physical medium such as wires.
Baseband Signals:- It is process in which data is transmitted directly over transmittion medium without change in modulation
Serial transmission:- Type of transmittion in which one bit is sent at a time
Synchronous transmission:- In this transmission. the data is transmitted block by block. and have no irregular gaps.

Weaker responses depicted poor knowledge about the terminologies of data transmission and defined the terms given in the question incorrectly. These responses included such as: Bandwidth sends and receives data in a network/ type of transmission through wired medium; Modulation transfers data to the application software/ it is the encryption process; Guided media sends and receives information and data/ guided media is where data is guided; Baseband signal controls the signals and transmits data/ a signal that is sent through a single wire; Serial transmission transmits data in a line/ used for long distance transmission; Synchronous transmission converts data into useful information/ data is transmitted with start and stop bit in synchronous transmission.

Example:


• Band width: It send and recieve the data through networks.
• Modulation: It transfer the data to Application software - e.g "routers",
• Guided Media: It send & recieve the data information and
• Base Band Signal: It control the signals and transmit data.
• Serial Transmission: It transfer the data in a line and its as
• Synchronous Transmission: It convert data into useful information

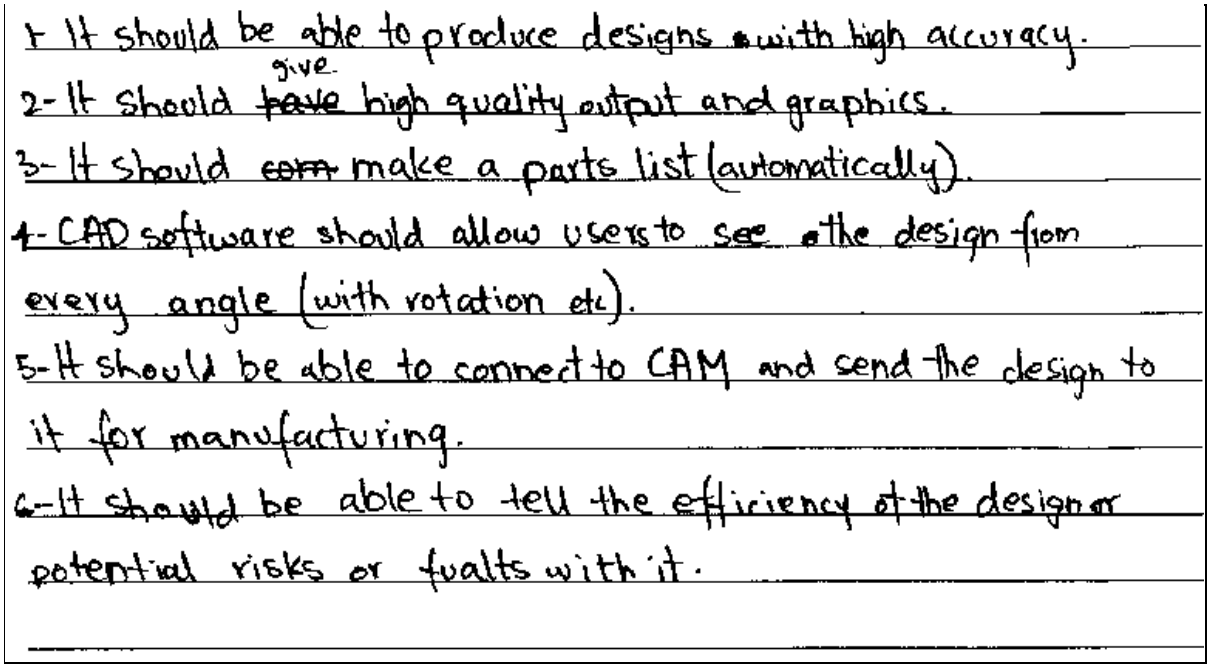
Question 6:

Computer aided design (CAD) is a software that is used to create drawings and designs that are used by computer aided manufacturing (CAM) to control the machine tools.

With reference to the given statement, describe any FIVE features that must be present in CAD software.

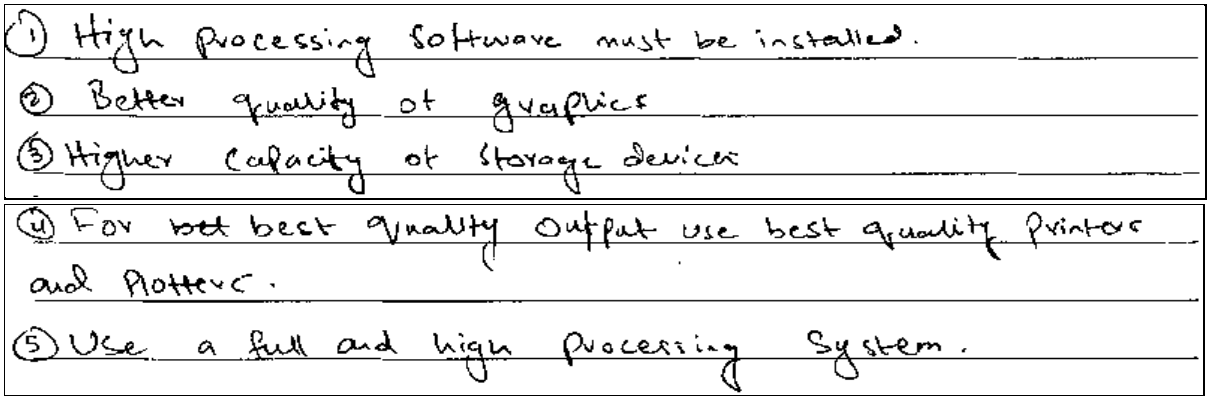
Better responses demonstrated a good understanding of the features of the CAD software. These responses included: creating 3D designs; rotate; enlarge; change colour; library of different components and parts; ability to print design; 360 degree view of model; conversion of designs into various file formats; it should allow labeling of diagram.

Example:



Weaker responses mostly contained general features of the graphics software rather than the features of CAD software. These responses included: high processing software; better quality of graphics; high capacity of storage devices; best quality printer and plotter is used for best quality output; used to give special effects in movies; helps to create model; reduced paper work; less labour is required; it saves time; it is used to create design that is printed on clothes.

Example:



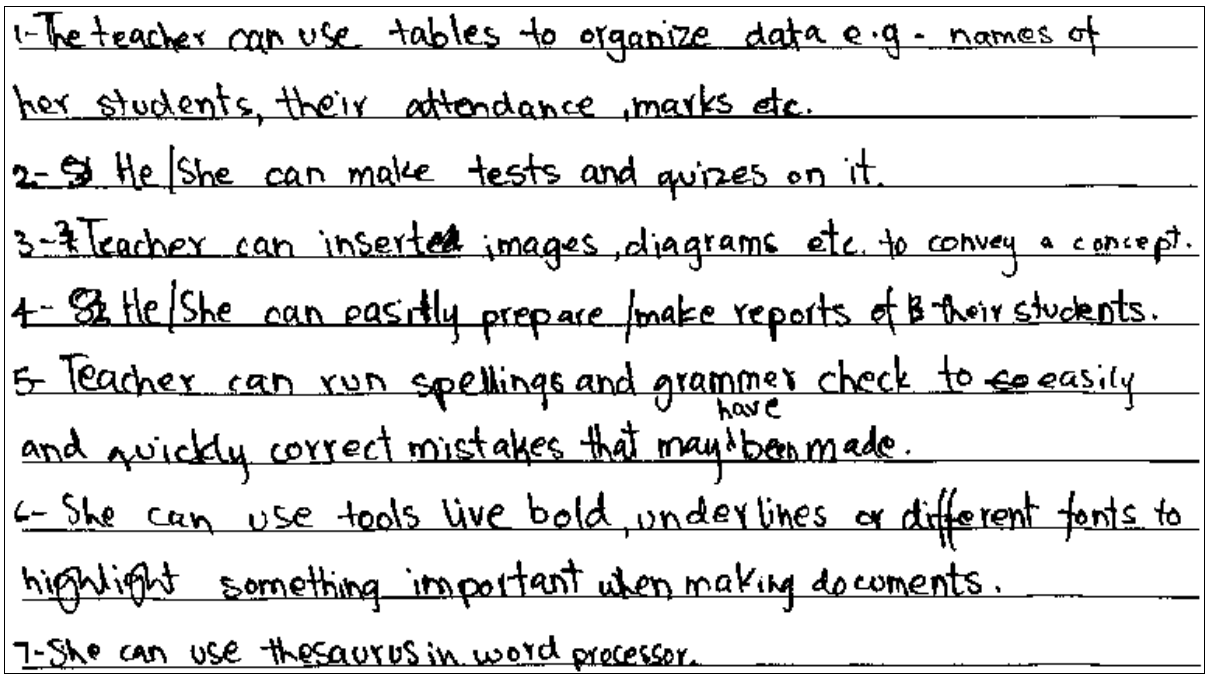
Question 7:

A teacher wants to use a word processor to simplify his/ her routine tasks in the school.

Describe any FIVE distinct features of word processor that will help the teacher to achieve this.

Better responses described those features of word processor that will help a teacher to simplify his/ her routine tasks. These responses included: inserting pictures related to the topic so that students can better understand it; inserting tables to store students' data; inserting charts; text editing; text formatting; document can be edited then and there and saved; spell check to detect errors in spelling and quickly correcting them; thesaurus can be used for looking meaning, synonyms and antonyms of words.

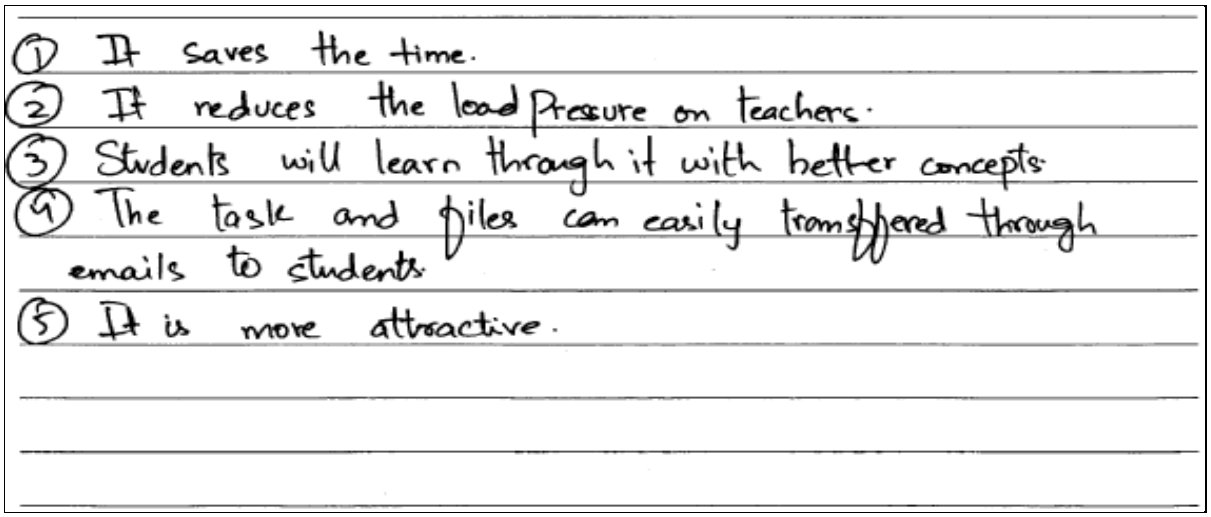
Example:


1- The teacher can use tables to organize data e.g - names of her students, their attendance, marks etc.
2- He/She can make tests and quizes on it.
3- Teacher can insert images, diagrams etc. to convey a concept.
4- He/She can easily prepare/make reports of their students.
5- Teacher can run spellings and grammer check to easily and quickly correct mistakes that may have been made.
6- She can use tools like bold, underlines or different fonts to highlight something important when making documents.
7- She can use thesaurus in word processor.

Weaker responses had irrelevant features or general features of word processor rather than the features that will help a teacher to simplify his/ her routine tasks. These responses

included: it saves time; it reduces pressure of work from teachers; students will learn better; it is more attractive; it is efficient and reliable; it has many editing features; it is fast; it is easy to maintain; it takes less storage space.

Example:



Question 8:

Ahmed is working on MS Word file that has two text boxes, **A** and **B**. He wants to perform a number of tasks using keyboard only.

Write a keyboard shortcut that Ahmed should apply to

a. make the text in the text box **A** same as text in the text box **B.**

I love Pakistan	*I Love Pakistan*
A	**B**

b. change the font size of text from 15 to 11 in the text box **B** of part (a).

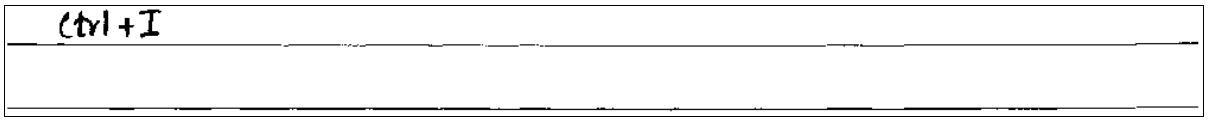
c. underline the text in the text box **B** of part (a).

d. retrieve the accidently deleted text from the text box **B**.

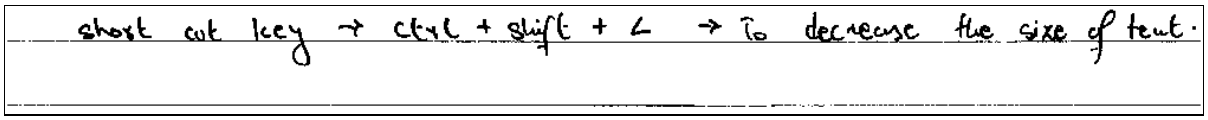
Better responses revealed that candidates understood the question very well and wrote the keyboard shortcut according to the requirement of each part. These responses for each part were as follows:

(a) Ctrl + I
(b) Ctrl + [
(c) Ctrl + U
(d) Ctrl + Z

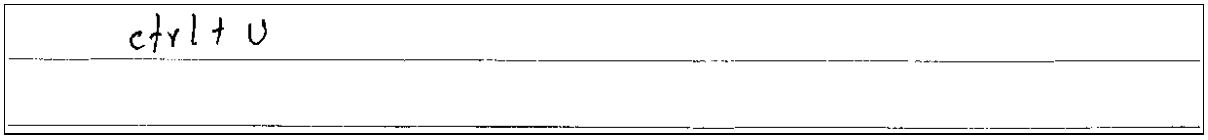
Example (a):



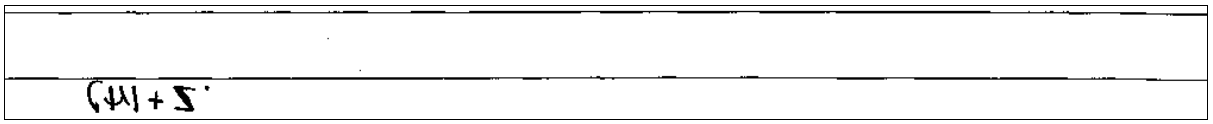
Example (b):



Example (c):



Example (d):



Weaker responses showed that candidates were not able to write the correct keyboard shortcuts according to the requirement in each part of this question. These responses for each part included:

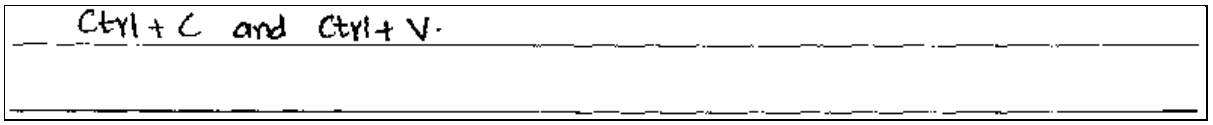
(a) Ctrl + B/ F8/ Ctrl + T/ Ctrl + C/ Ctrl + V/ Ctrl + A

(b) Ctrl + Up Arrow Key/ Ctrl + F11/ Ctrl + Shift + X/ Ctrl + Down Arrow Key/ Ctrl + F

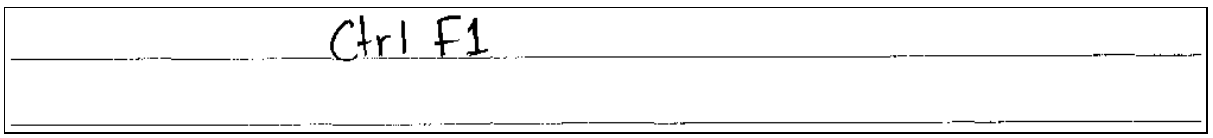
(c) Ctrl + Shift + U/ F9/ Ctrl + B/ Shift + Tab + Enter

(d) Backspace/ Ctrl + Y/ F7/ Ctrl + A/ Ctrl + O/ Ctrl + R

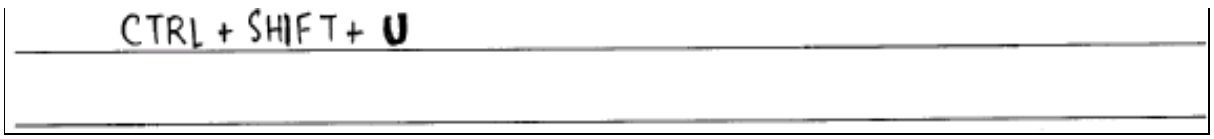
Example (a):



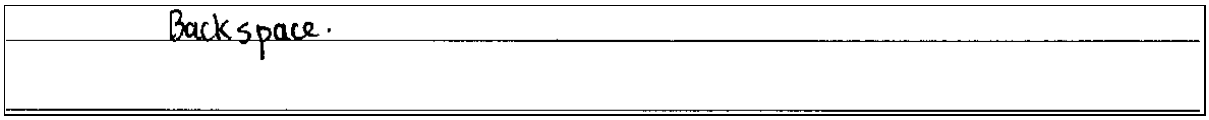
Example (b):



Example (c):



Example (d):



Question 9:

	A	B	C	D	E
1	**Training Participants Data**				
2	**Name of Participant**	**Name of School**	**Gender**	**Age**	**Qualification**
3	Mubashir Ahmed	Bright Light School	M	32	MA
4	Rana Asad	New Horizon School	M	26	MA
5	Fatima Khan	Pure Pakistani School	F	29	BA
6	Shumaila Ali	The Best School	F	30	MA
7	Aqeel Ahmed	New Horizon School	M	28	BA
8	Amna Siddiqui	Bright Light School	F	27	MA
9	Javed Ahmed	The Best School	M	31	MA

Consider the given Excel sheet containing Training Participants' Data and write MS Excel function with appropriate cell ranges and values to calculate the

a. total number of participants.

b. average age of participants.

c. age of the youngest participant.

d. number of participants whose qualification is MA.

e. number of participants with age more than and equal to 30.

Better responses demonstrated a good understanding of MS Excel functions and formulae and applied them according to the given scenario. For instance, in each part, these responses included:

(a) =(COUNT(A3:A9)) or =COUNT(A3:A9)

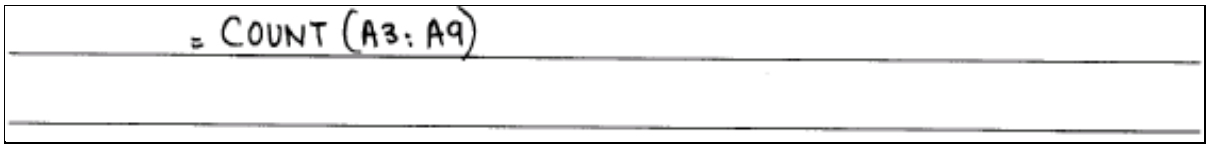
(b) =(SUM(D3:D9))/7 or =Average(D3:D9) or (D3+D4+D5+D6+D7+D8+D9)/7

(c) =MIN(D3:D9), in part

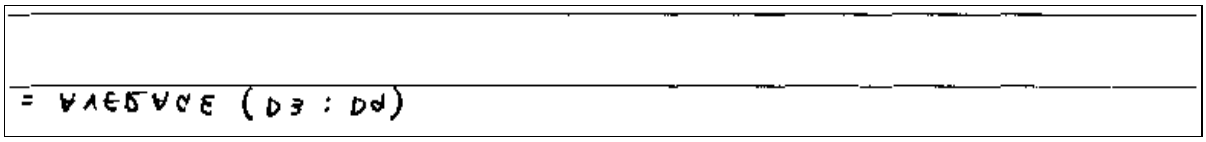
(d) =COUNTIF(E3:E9, "MA")

(e) =COUNT(D3:D9, ">=30")

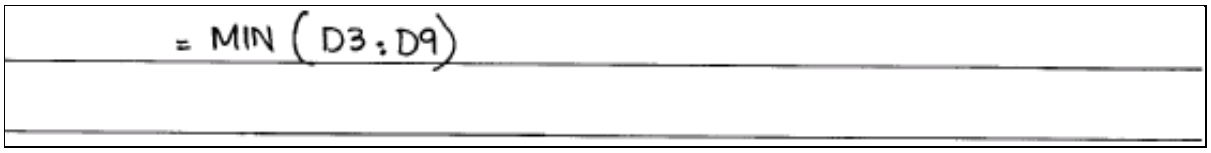
Example (a):



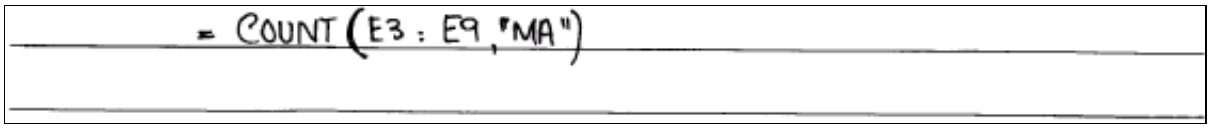
Example (b):



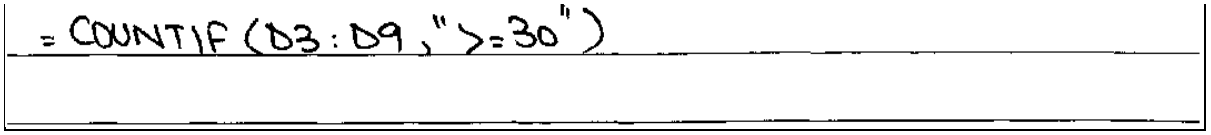
Example (c):



Example (d):



Example (e):



Weaker responses depicted lack of understanding of the formulae and functions of MS Excel and were unable to apply them correctly according to the given scenario. For instance, in each part, these responses included:

(a) number of participants, i.e. 7/ used cell range from A2 to A9, for instance, =SUM(A2:A9)/ =Total(A2:A9)/ =SUM(A2:A9)

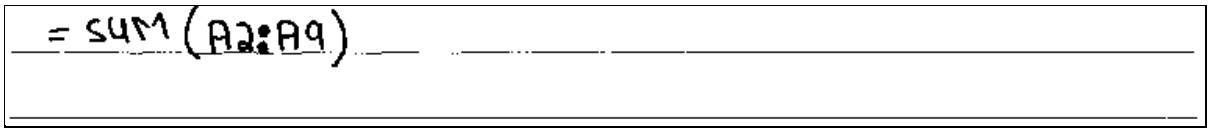
(b) Average(=D3:D9)/ AVG(D3:D9)/ =(A2+A3+A4+A5+A6+A7+A8+A9) / 8

(c) the numeric value of minimum age, i.e. 27/ =PRINT "D4"/ =MAX(D3:D9)/ =SUMIF(D3>D9)

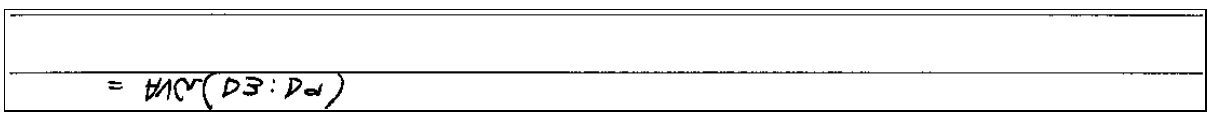
(d) COUNTIF with space/ =SUM(D3, D4, D6, D8, D9)/ =SUM(=IF(E3:E9, "MA"))/ COUNT(IF(E3:E9) = "MA")

(e) the number of candidates 3/ =COUNT IF(D3:D9 > 30 AND D3:D9 = 30)/ =COUNTIF(D3:D9, "=30", ">30")/ COUNT(=E3, E6, E9)

Example (a):



Example (b):



Example (c):

=MAX(D7:D9)

Example (d):

=SUM(=if(E3:E9,"MA"))

Example (e):

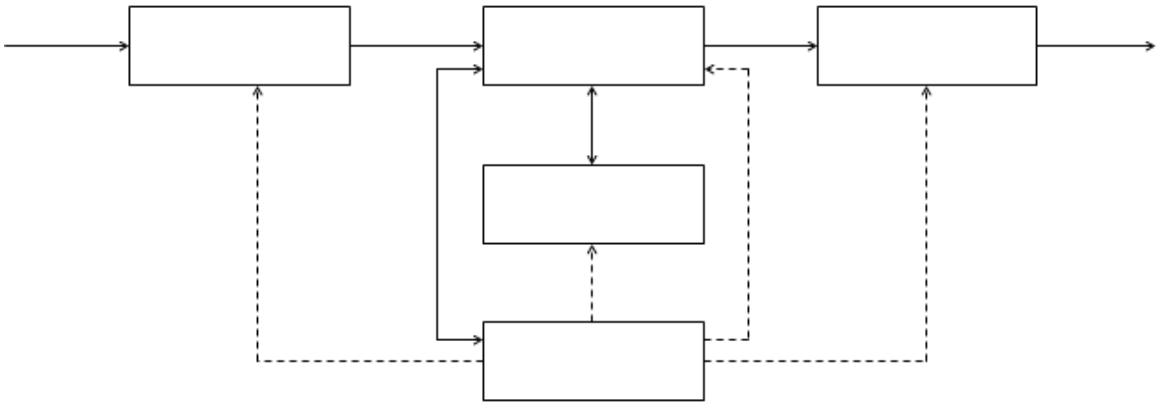
=COUNT IF (D3:D9 > 30 AND D3:D9 =30)

Extended Response Questions (ERQs)

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

Question 10a:

i. Consider the given blank block diagram of a computer system.



(**Note:** In the given diagram, the data line is represented by ⇄ and the control line is represented by - - - → .)

Read the terms listed below and complete the above blank block diagram by placing the **number** of each term in appropriate box.

S. No.	Term
1.	Control unit
2.	Memory unit
3.	Arithmetic logic unit
4.	Register
5.	Input unit
6.	Output unit

ii. Describe any TWO differences between random access memory (RAM) and read only memory (ROM).

iii. Describe the purpose of each of the given buses in a computer system.

- Data bus
- Address bus
- Control bus

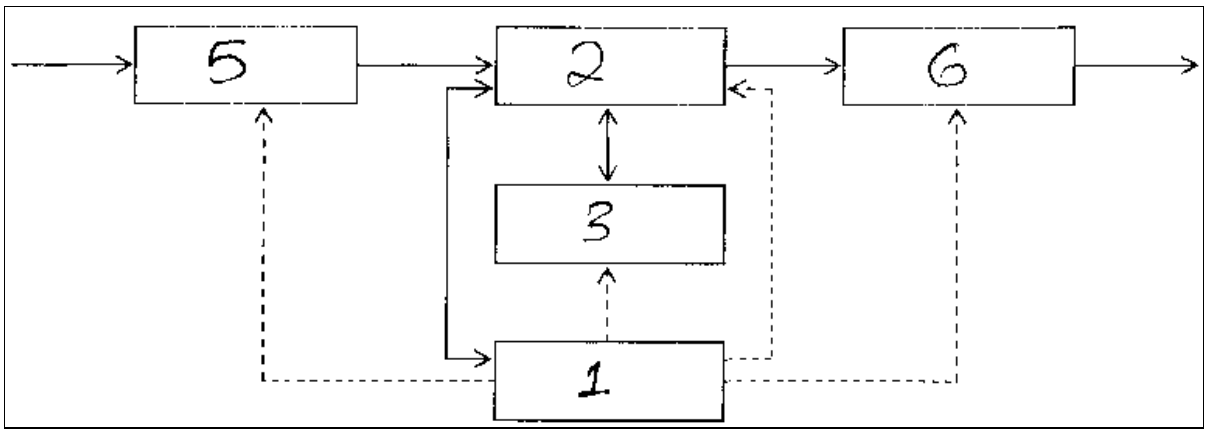
(**Note:** Most of the candidates attempted this part and they performed well.)

Better responses showed that candidates had a good understanding of the block diagram of a computer system and completed the diagram by writing the correct term numbers in the relevant boxes.

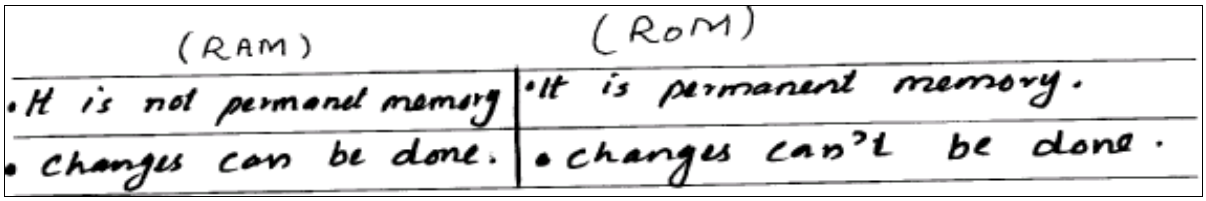
Likewise, these responses differentiated RAM and ROM correctly. For instance, these responses included: RAM is temporary memory while ROM is permanent memory; RAM stores data until power is supplied while ROM retains data even if power supply is off; RAM is volatile memory while ROM is non-volatile memory.

Similarly, these responses depicted strong understanding of the different types of buses and described the purpose of each bus correctly. These responses included: data bus carries data signal; it connects CPU, memory, input and output devices; address bus carries memory address signals; it connects CPU and memory only; control bus carries signals from the control unit to other units; control bus carries signals to control activities of all units.

Example (i):

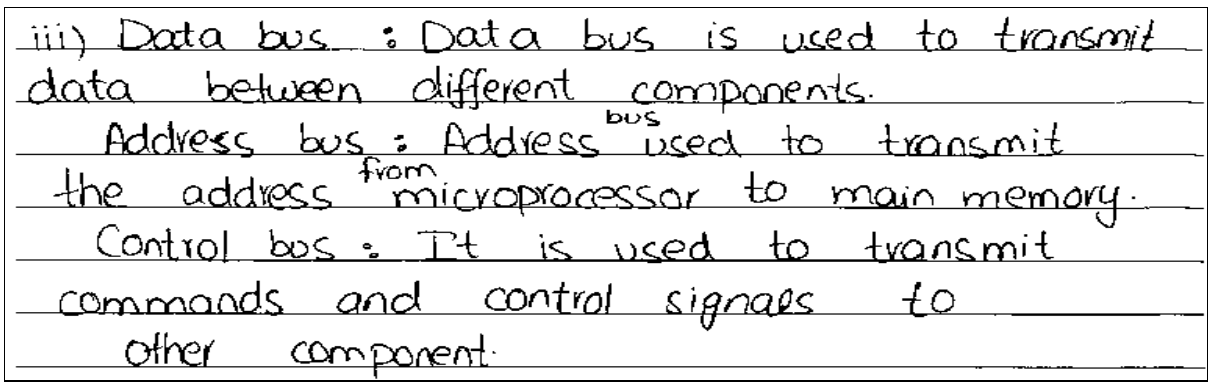


Example (ii):



(RAM)	(ROM)
• It is not permanent memory	• It is permanent memory.
• changes can be done.	• changes can't be done.

Example (iii):



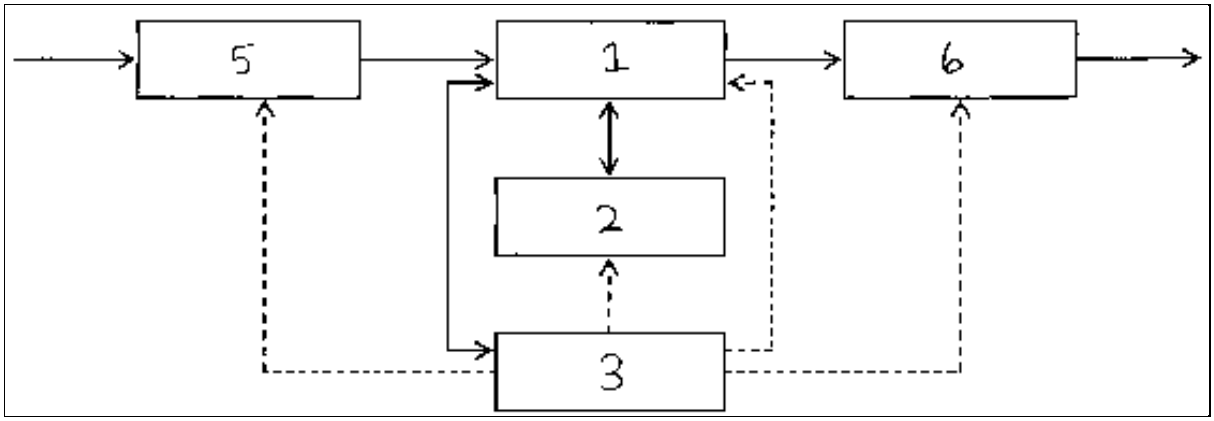
iii) Data bus : Data bus is used to transmit data between different components.
Address bus : Address bus used to transmit the address from microprocessor to main memory.
Control bus : It is used to transmit commands and control signals to other component.

Weaker responses depicted poor understanding of the block diagram of a computer system. Some of these responses managed to identify the input and output blocks but were unable to identify other blocks.

Likewise, these responses mostly managed to write one difference between RAM and ROM, i.e. RAM is a temporary memory and ROM is a permanent memory. However, second difference written by the candidates included: RAM stores less amount of data than ROM; RAM stores recently performed tasks while ROM stores complete files; RAM can only be accessed by programs while ROM can be accessed by only persons.

Similarly, these responses managed to write the purpose of data bus but showed lack of understanding about control bus and address bus. These responses included: control bus specifies the path for data to flow; control bus manages most of the CPU commands; each component in computer has its own address and address bus stores that address; data bus stores the memory that is used by CPU; control bus is used to control signals and transfers data from memory to CPU; address bus stores their ID and send and receive data.

Example (i):



Example (ii):

(RAM)	(ROM)
It is temporary storage device.	It is permanent storage device.
It stores recently performed task.	It stores computer files.

Example (iii)

iii). Data bus: It transfer instruction to memory and to CPU. and its is also transfer data from memory to others.
- Adress Bus: They contain their own Id called its address. It's main task is to send and recieve the data from bus.
- Control Bus: It is used to control the signals and transfer data from memeory to CPU (Central Processing Unit).

Question 10b:

i. Describe any SIX different computer crimes.

ii. List any FOUR data protection rules to keep data safe.

Question 10b (i):

Better responses revealed that candidates had good understanding of computer crimes. Most of these responses described hacking, phishing, software piracy, information theft, plagiarism, transmitting computer viruses, cyber bulling and pharming.

Example:

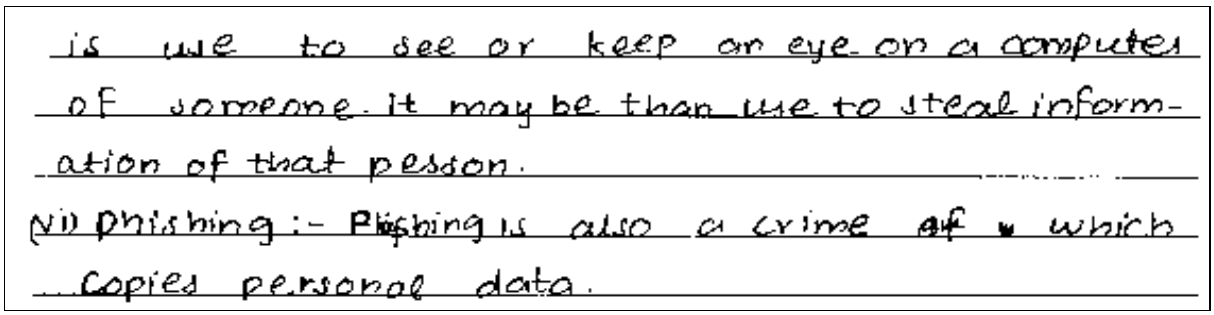
(i) Hacking :- Hacking is a computer crime in which someone gain access to your information eg your e-mail account.

(ii) Computer viruses :- some people make programs that are designed to steal data from computer or replicate files etc.

(iii) Software piracy :- Software piracy is to use or to sell product without the permission of the owner.

(iv) TROJAN HORSE :- Trojan horse is a program is is use to copy, replicate files on a computer it may also delete files.

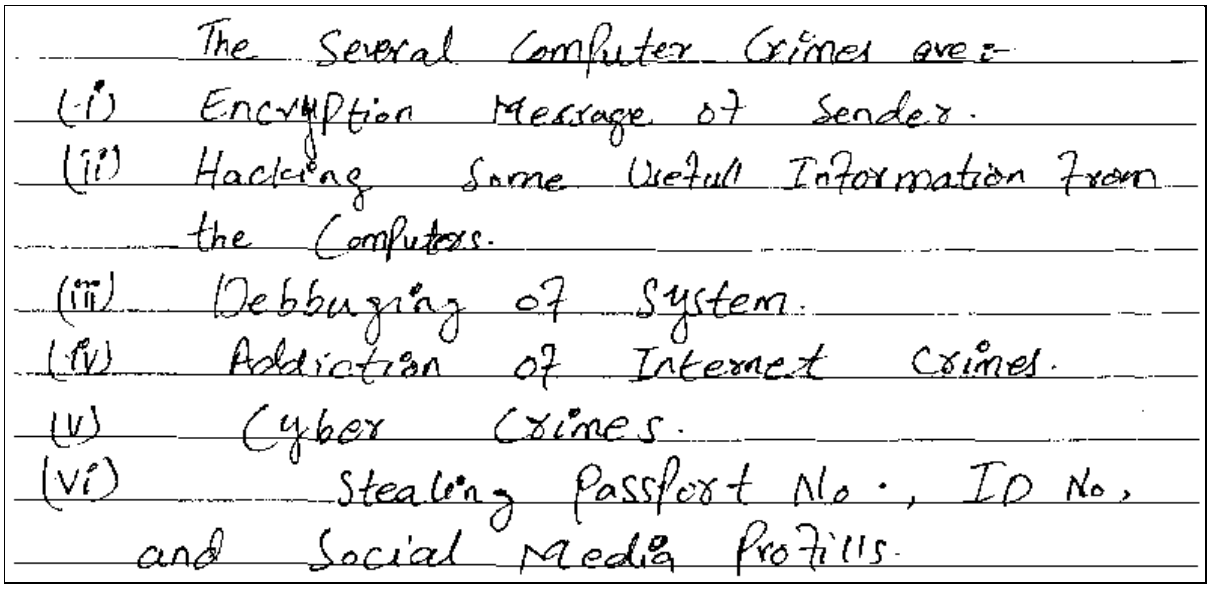
(v) SPYCAM :- SPYCAM is a program that


is use to see or keep an eye on a computer of someone. It may be than use to steal information of that person.

(vi) phishing :- Phishing is also a crime of which copies personal data.

Weaker responses showed that candidates had lack of understanding of the computer crimes and described irrelevant terms rather than computer crimes. These responses described encryption, debugging, addiction of internet, copyrights, client-server overuse and hard disk loading.

Example:


The Several Computer Crimes are :-

(i) Encryption Message of Sender.

(ii) Hacking Some Useful Information from the Computers.

(iii) Debbuging of System.

(iv) Addiction of Internet Crimes.

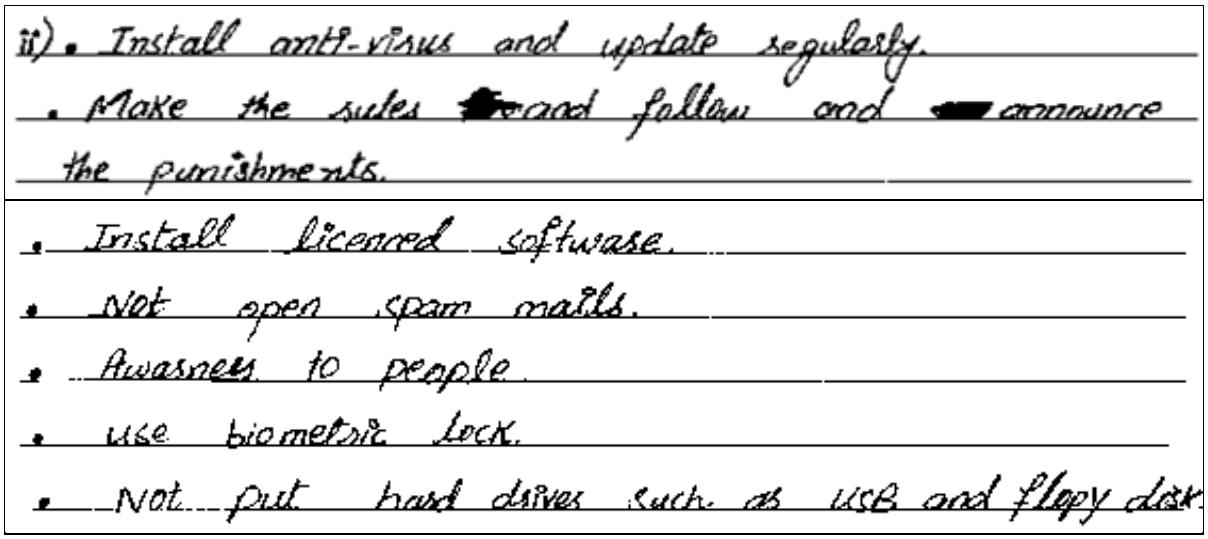
(v) Cyber Crimes.

(vi) Stealing Passport No., ID No, and Social Media Profiles.

Question 10b (ii)

Better responses showed that the candidates struggled to write exact data protection rules and mostly wrote measures to protect data such as: the firewall should be used to protect network data; password should be changed frequently; update software frequently; data must be store in a backup; install antivirus and update it regularly; install licensed software because unlicensed software may steal your data; avoid opening spam email; use biometric verification to login to system; avoid connecting external hard drives and flash drives to your system.

Example:



Weaker responses mostly mentioned either non-tech security steps or incorrect rules. These responses included: data can be protected by errors; data is protected by eye witness; use personal security to secure data; do not share personal information with anyone; avoid using copyrighted software because they authorise a user to get your personal data; do not download copyrighted software because it brings virus in computer.

Example: