Aga Khan University Examination Board

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

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 2017 HSSC-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 data processing cycle, software development life cycle (SDLC), computer networks, applications and uses of computers, word processor (MS Word) and computer architecture were well attempted. However, questions based on types of topology, layers of OSI model, data communication, spreadsheet (MS Excel) and data protection were generally not well attempted.

Detailed Comments:

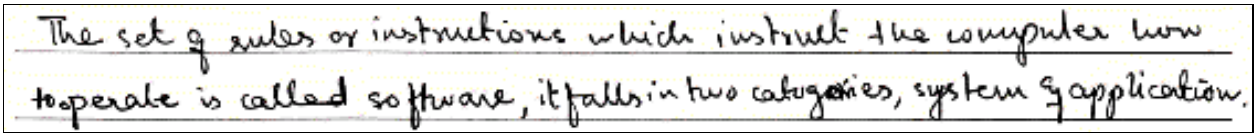
Constructed Response Questions (CRQs)

Question 1a:

Define the term 'software' with reference to computer system.

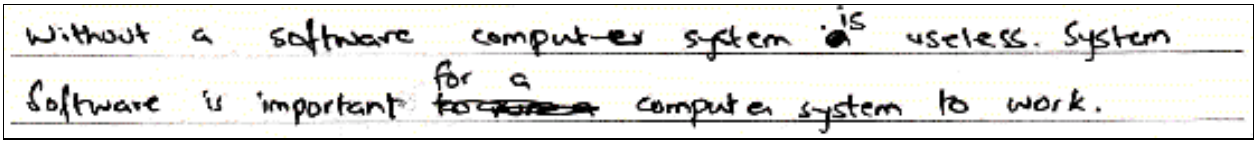
Better responses wrote specific definition of software rather than writing general information about software.

Example:



Weaker responses wrote general points about computer software. Similarly, few of such responses wrote the types of software, e.g. system software and application software rather than defining it.

Example:

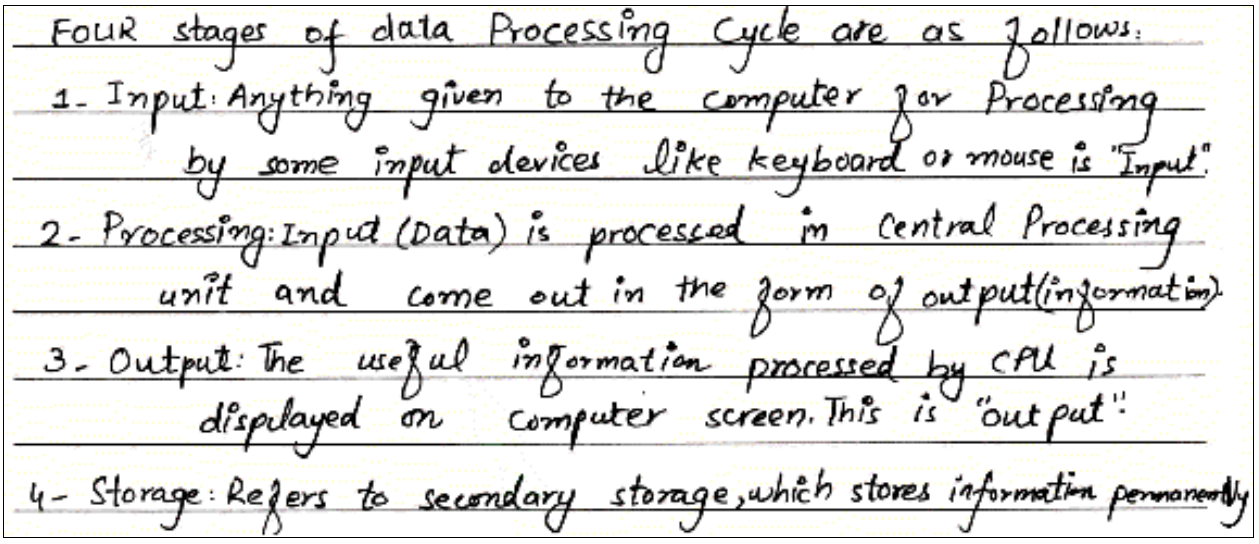


Question 1b:

Describe FOUR stages of data processing cycle.

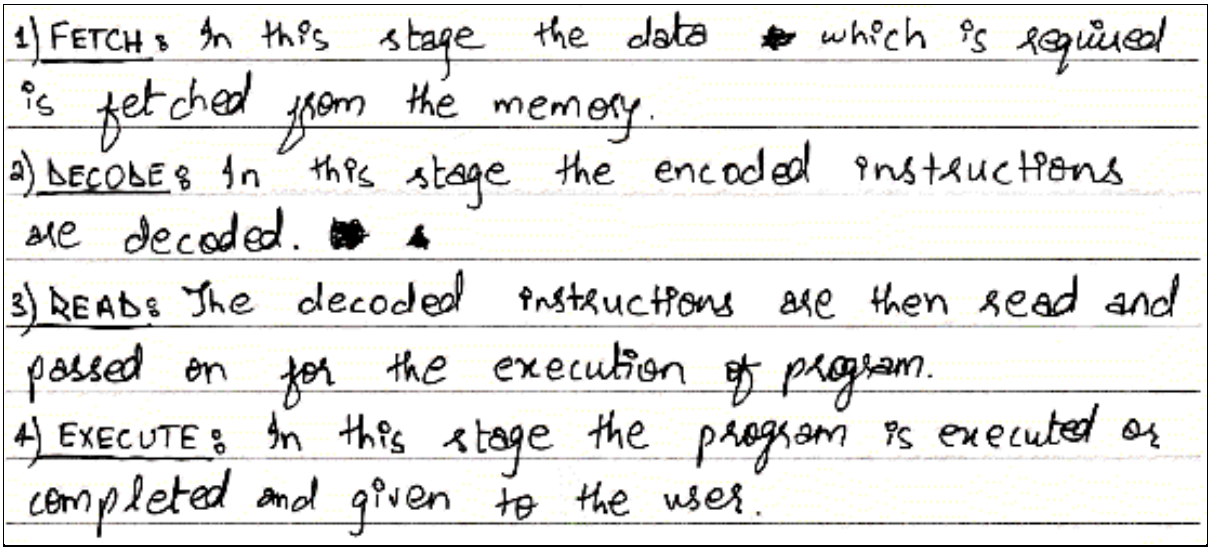
Better responses showed good understanding of data processing cycle and listed the names of FOUR stages of data processing cycle, i.e. input, processing, output and storage and described each stage properly.

Example:


FOUR stages of data Processing Cycle are as follows:
1- Input: Anything given to the computer for Processing by some input devices like keyboard or mouse is "Input".
2- Processing: Input (Data) is processed in Central Processing unit and come out in the form of output(information).
3- Output: The useful information processed by CPU is displayed on computer screen. This is "output".
4- Storage: Refers to secondary storage, which stores information permanently

Weaker responses depicted that candidates misunderstood the question and wrote about fetch-decode-execute cycle and software development life cycle (SDLC) rather than writing about data processing cycle. Likewise, some responses wrote only names of steps due to which they lost marks.

Example:


1) FETCH: In this stage the data which is required is fetched from the memory.
2) DECODE: In this stage the encoded instructions are decoded.
3) READ: The decoded instructions are then read and passed on for the execution of program.
4) EXECUTE: In this stage the program is executed or completed and given to the user.

Question 2:

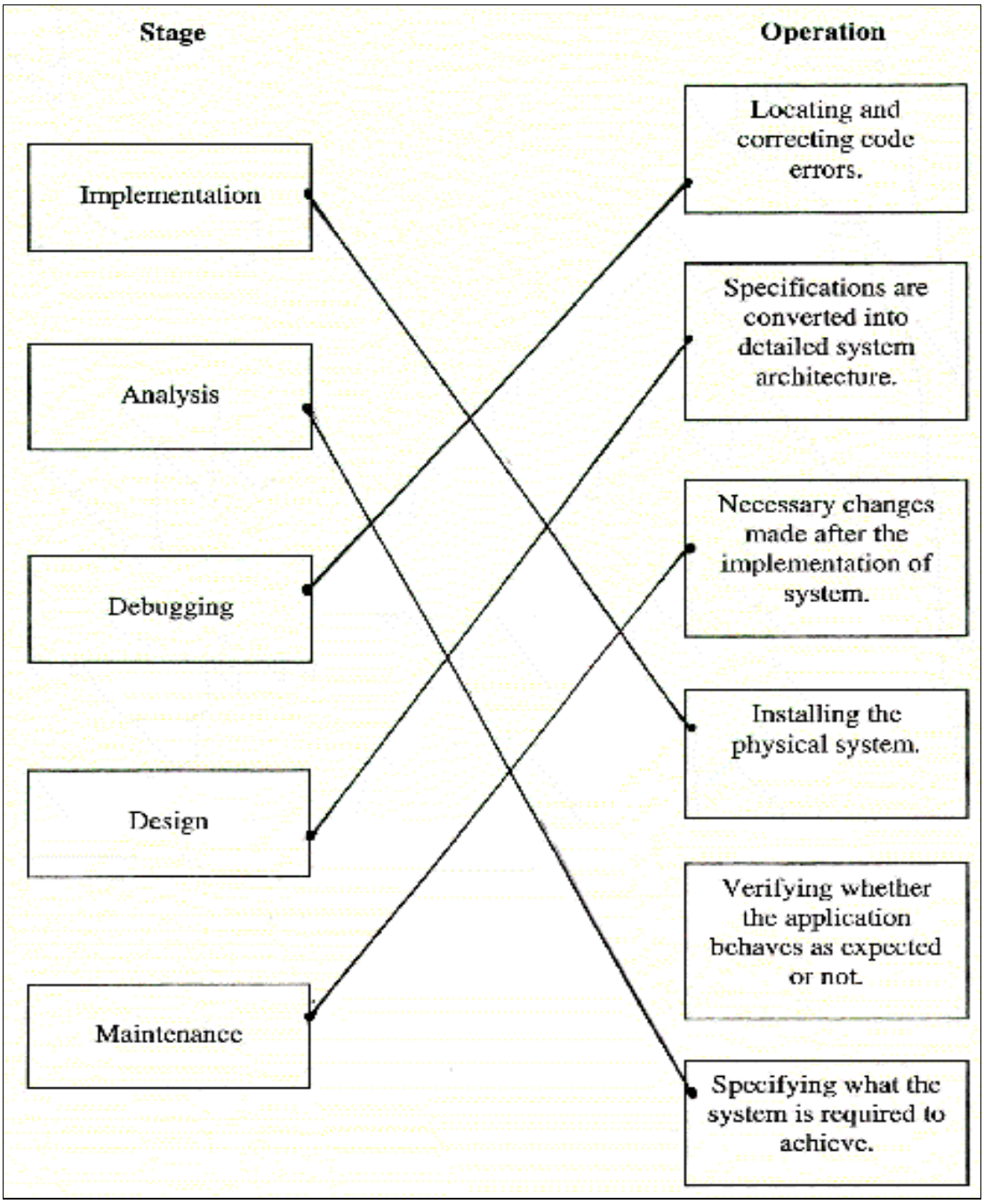
There are different stages in the system development life cycle.

Draw a line to connect each stage of the system development life cycle on left side to the respective operation on right side.

Stage	Operation
Implementation	Locating and correcting code errors.
Analysis	Specifications are converted into detailed system architecture.
Debugging	Necessary changes made after the implementation of system.
Design	Installing the physical system.
Maintenance	Verifying whether the application behaves as expected or not.
	Specifying what the system is required to achieve.

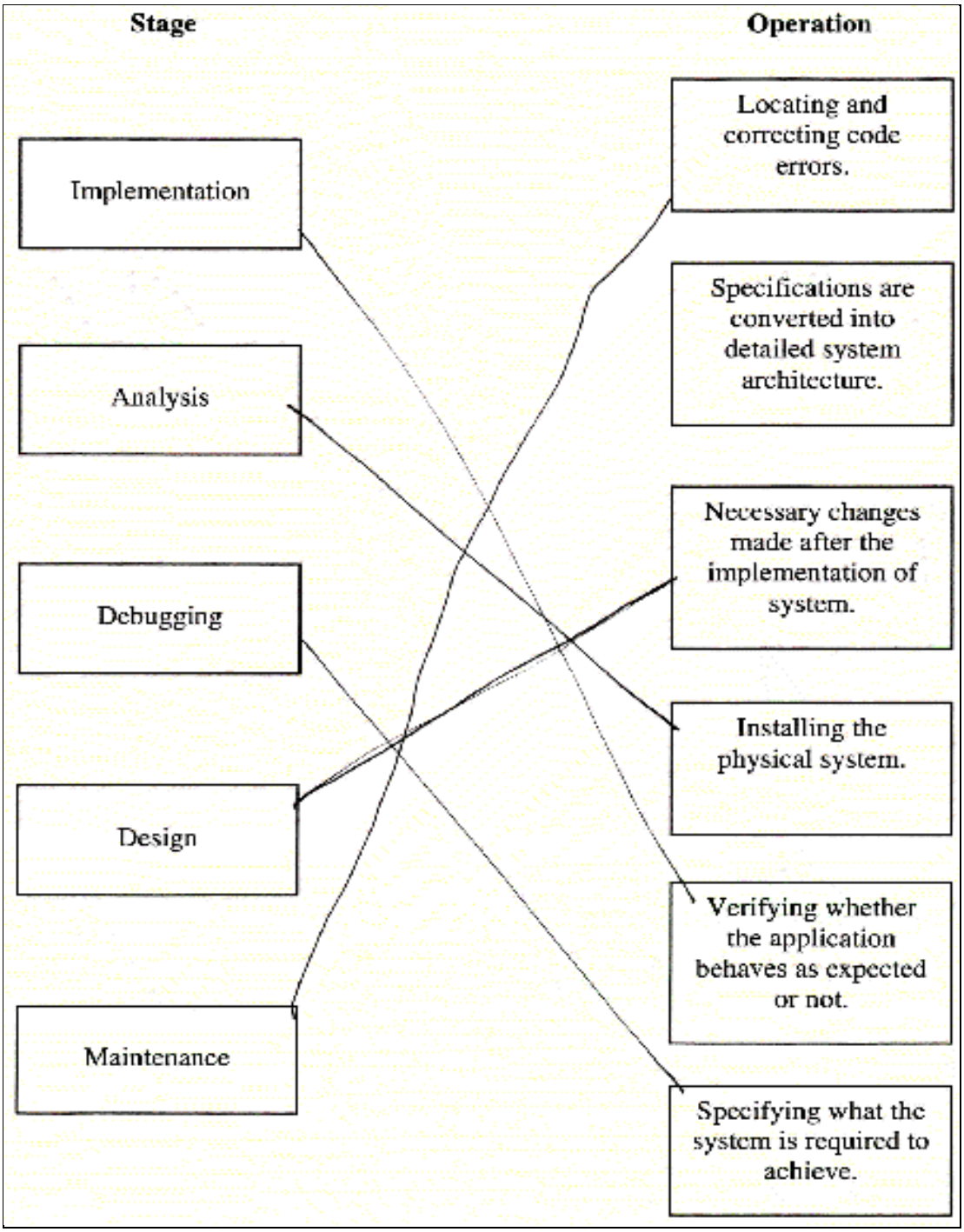
Better responses showed that candidates had good understanding of each stage in System Development Life Cycle (SDLC) and based on their understanding they matched each stage with corresponding operation.

Example:



Weaker responses showed that most of the candidates were confused among the given operations of analysis, debugging and maintenance stages of SDLC and matched these stages with incorrect operations.

Example:

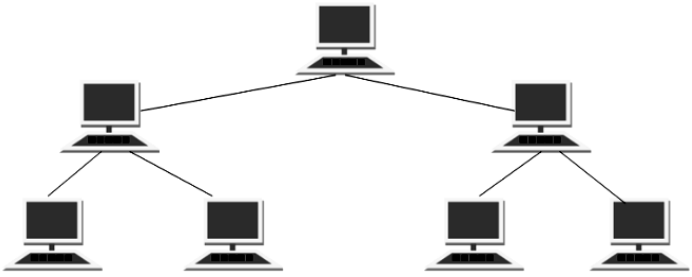


Question 3:

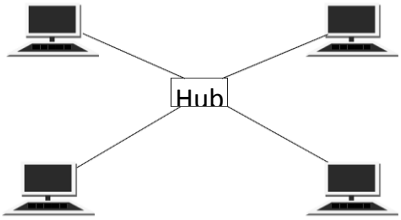
There are different network topologies to describe the layout of devices connected on a network.

- Name the topology shown in (i).
- Write ONE advantage and ONE disadvantage of each topology in (i) and (ii).

i.



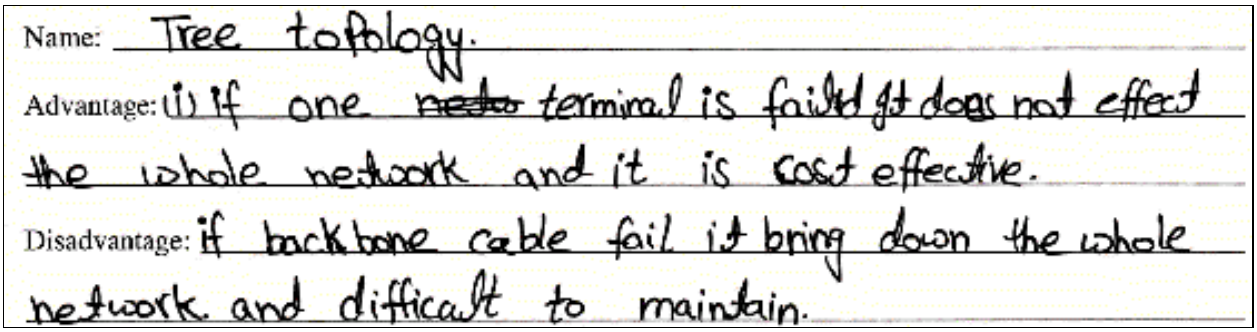
ii. Name: Start Topology



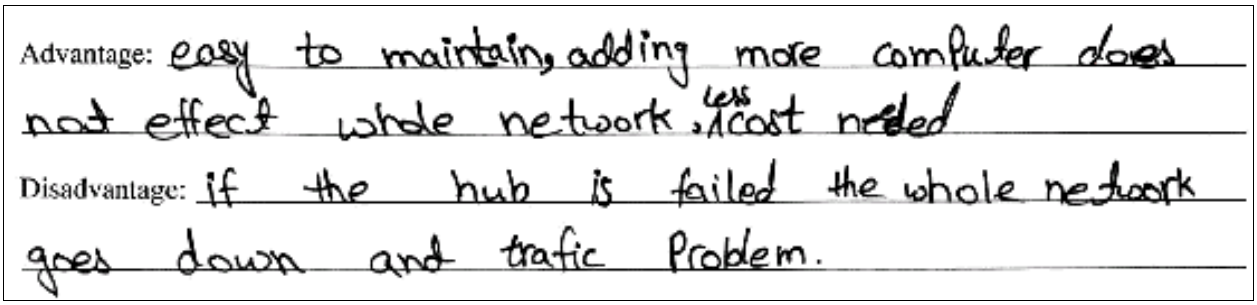
Better responses depicted good understanding of topologies in computer network and identified the topology given in (i) correctly as tree topology and wrote the relevant advantages and disadvantages of topologies given in parts (i) and (ii).

Example:

(i)



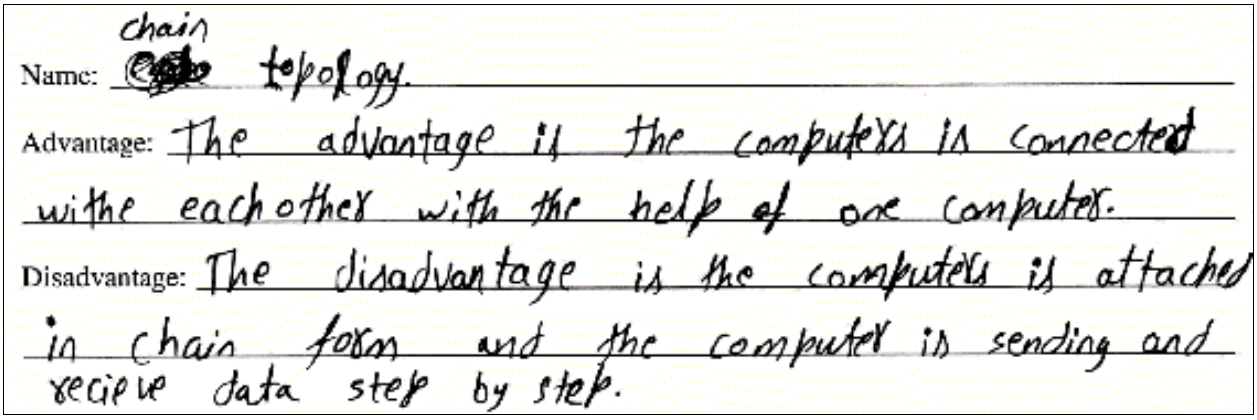
(ii)



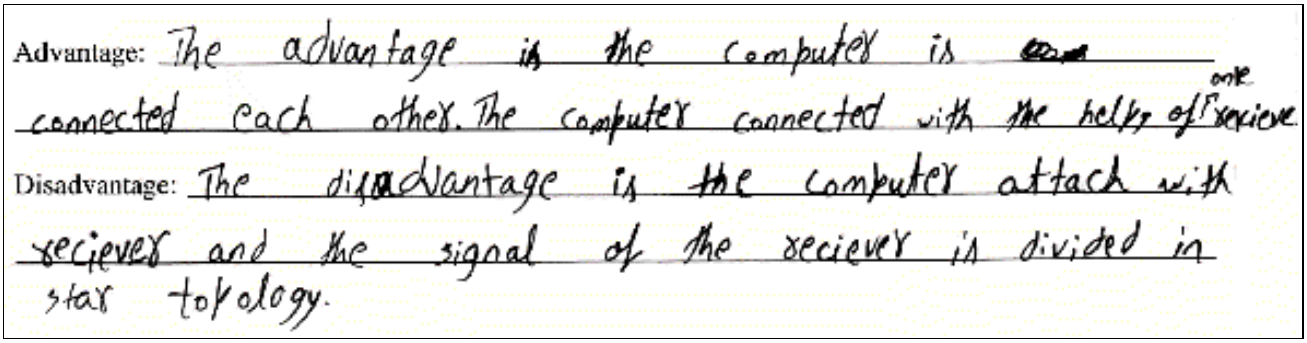
Weaker responses showed that candidates mixed the concepts of tree topology and hybrid topology due to which they could not correctly identify the topology given in part **(i)**. Likewise, such responses could not mention proper advantages of given topologies. Instead of that, such candidates wrote general advantages of a topology. Moreover, some of these responses also mixed up the advantages and disadvantages of star and hybrid technology.

Example:

(i)



(ii)

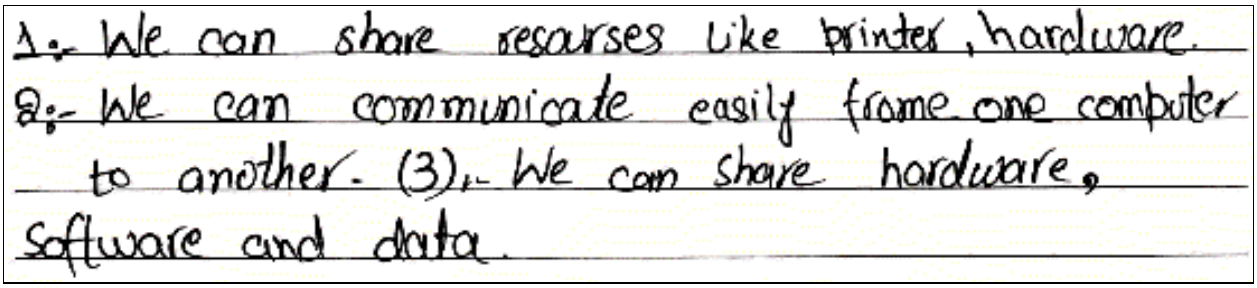


Question 4a:

Write any TWO advantages for an organisation of having a computer network.

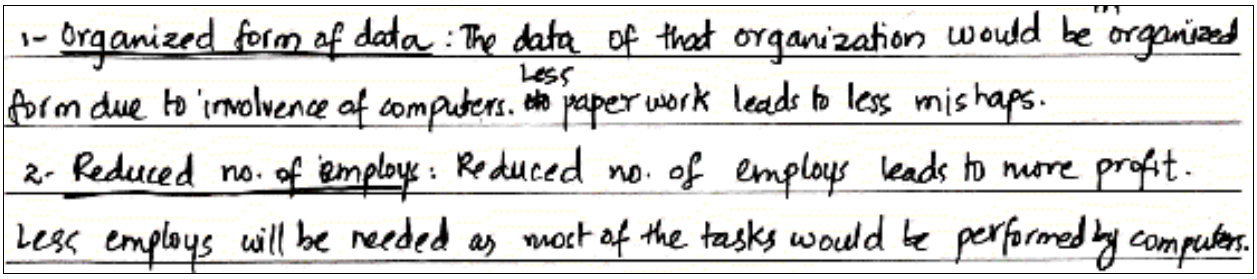
Better responses wrote two specific advantages of computer network for an organization. Common responses include advantages such as resource sharing\ file sharing\ sharing internet resources.

Example:


1:- We can share resarses like printer, hardware.
2:- We can communicate easily frome one computer to another. (3):- We can share hardware, software and data.

Weaker responses depicted that either candidates did not know the benefits of a computer network or misunderstood the question and thought that they had to write the advantages of having computers\ internet\ advantages of e-commerce and general benefits of a computer network for an organisation. Most of such responses wrote that fewer employees are required to do the work; computer gives fast results; give results with more accuracy etc.

Example:


1- Organized form of data: The data of that organization would be organized form due to involvence of computers. Less paper work leads to less mishaps.
2- Reduced no. of employs: Reduced no. of employs leads to more profit. Less employs will be needed as most of the tasks would be performed by computers.

Question 4b:

i. Name the first OSI layer through which data traverse (pass) at the data sending side.

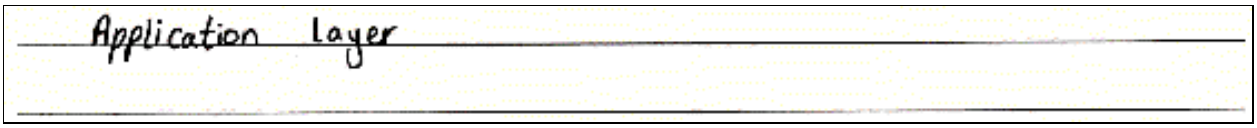
ii. Name the first OSI layer through which data traverse at the data receiving side.

iii. Which OSI layer decides the physical pathway between sender and receiver in a computer network?

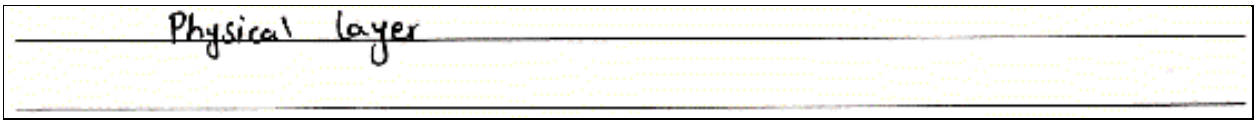
Better responses showed that candidates knew the function of each layer of OSI model very well and wrote the name of correct layer for each data transmission scenario given in parts (i) , (ii) and (iii).

Example:

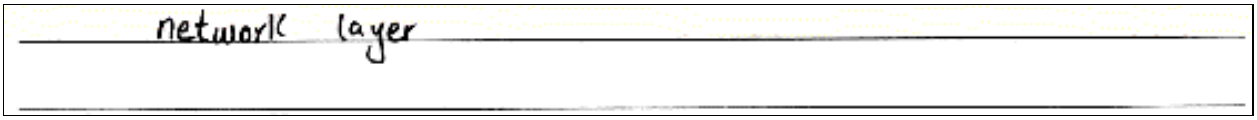
(i)



(ii)



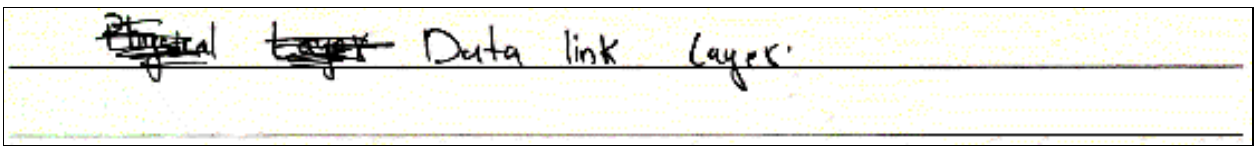
(iii)



Weaker responses depicted weaker understanding of OSI model and it seems that candidates were confused between the functions of layers of OSI model due to which they wrote incorrect layer names such as data link layer, session layer and transport layer instead of application layer, physical layer and network layer.

Example:

(i)



(ii)

Session Layer.

(iii)

Transport Layer.

Question 5a:

Describe any THREE differences between synchronous and asynchronous transmission of data.

Better responses wrote correct differences between synchronous transmission (ST) and asynchronous transmission (AT) , for instance, ST has no start and stop bit but AT has start and stop bit; characters are sent with same time interval in ST but with random time intervals in AT; synchronised clock is used in ST but no clock is used in AT.

Example:

Asynchronus Transmission of Data	Synchronus Transmission of Data
– Each character is sent seperately with a random amount of pauses between them.	– A large number / groups of data may be sent together without pauses.
– It uses start and stop bit before and after the data is sent, respectively.	– Start and stop bits are not used.
– No clock used.	– Clock is used to regulate sent data.

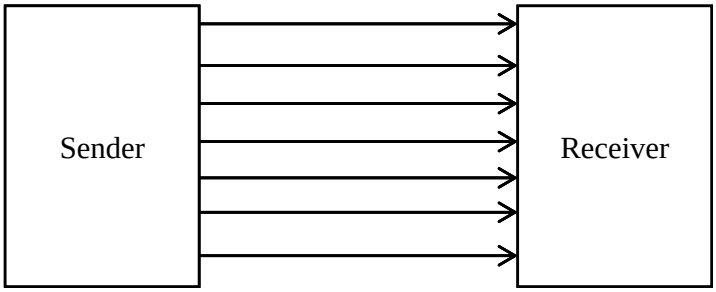
Weaker responses depicted that candidates confused the concepts of ST and AT with that of serial and parallel transmission or with simplex and duplex transmission and wrote their differences rather than writing about the asked transmission.

Example:

1- Synchronous is the simplex transmission of data while asynchronous is the half-duplex transmission of data.
2- Synchronous is more secure as it have start and stop bits while asynchronous is less secure.
3- One bit at a time travel in synchronous transmission while 1 byte travel in asynchronous transmission.

Question 5b:

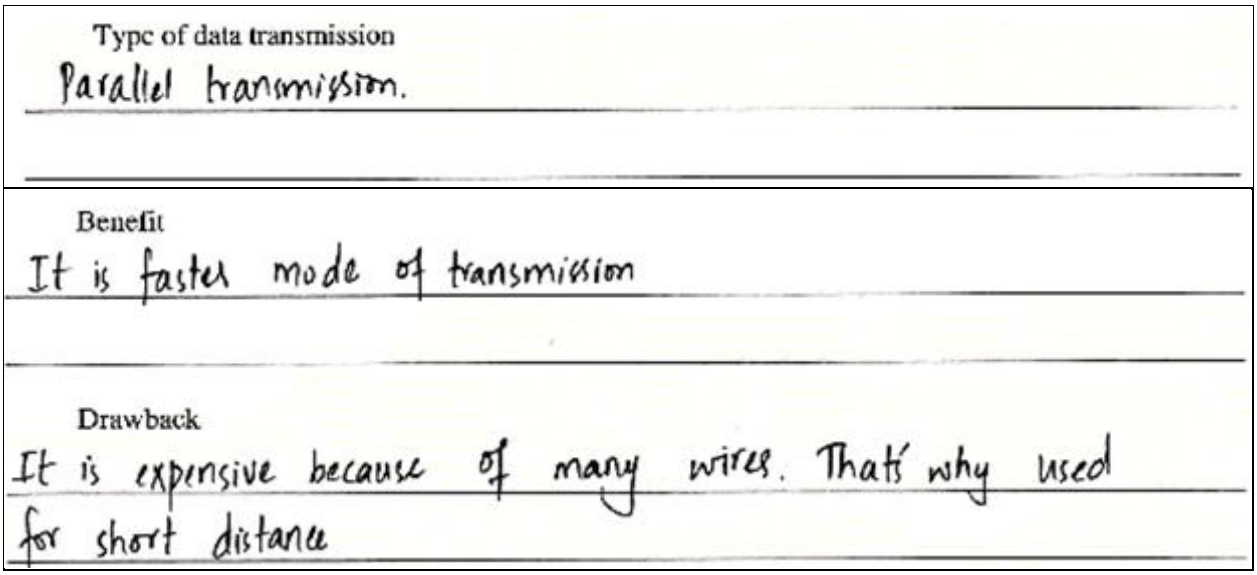
Consider the given transmission of data.



Identify the type of the given data transmission as serial or parallel. Write ONE benefit and ONE drawback of this type of data transmission.

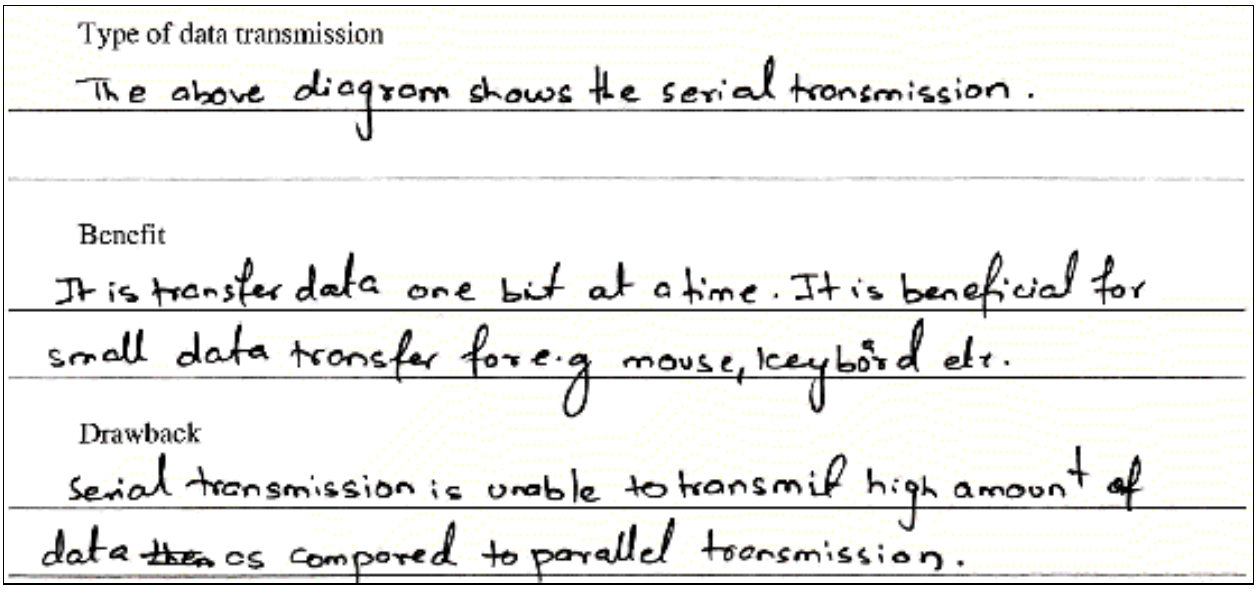
Better responses showed good understanding of parallel and serial transmission and identified the type of transmission in the given figure correctly, i.e. parallel transmission. Likewise, such responses wrote correct benefits and drawbacks of parallel transmission such as it is faster; multiple bits are transferred at a time; it is used for short distance transmission; it is costly.

Example:



Weaker responses mostly identified it as serial transmission and wrote the benefits and drawbacks of serial transmission. Some responses also identified it as simplex transmission by just seeing the one-sided arrows in the diagram but it seems that they did not read the question properly. Likewise, they had written the benefits and drawbacks of simplex transmission rather than parallel transmission.

Example:



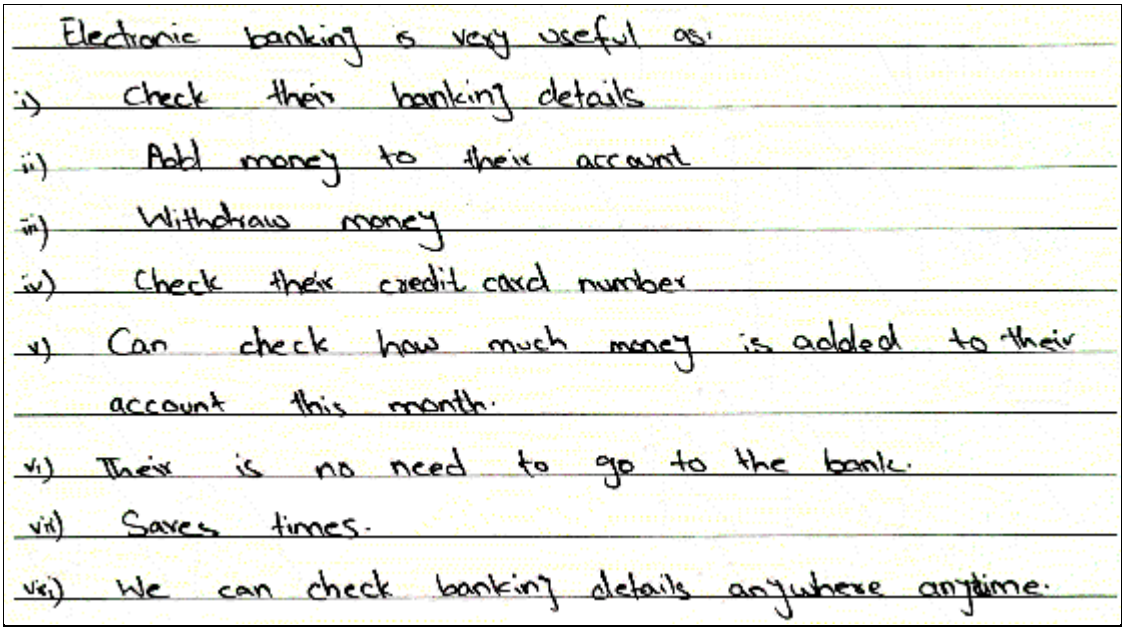
Question 6:

Computers have a number of uses in the banking sector.

Describe FIVE benefits of using computers in electronic banking.

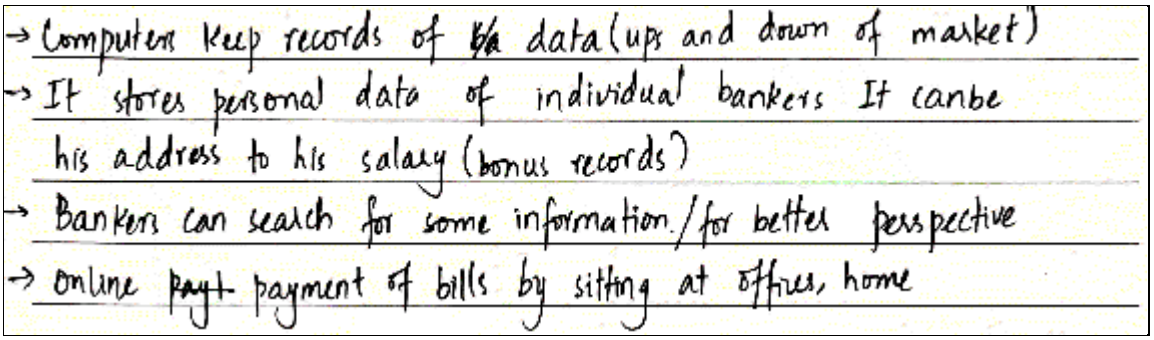
Better responses showed that candidates had strong concepts about the uses of computers in different fields of life and wrote the benefits of using computers in electronic banking rather than writing the general benefits of computers.

Example:


Electronic banking is very useful as:
i) Check their banking details
ii) Add money to their account
iii) Withdraw money
iv) Check their credit card number
v) Can check how much money is added to their account this month.
vi) Their is no need to go to the bank.
vii) Saves times.
viii) We can check banking details anywhere anytime.

Weaker responses did not understand the context of the question and wrote general benefits of using computer rather than writing about the benefits of using computers in electronic banking.

Example:

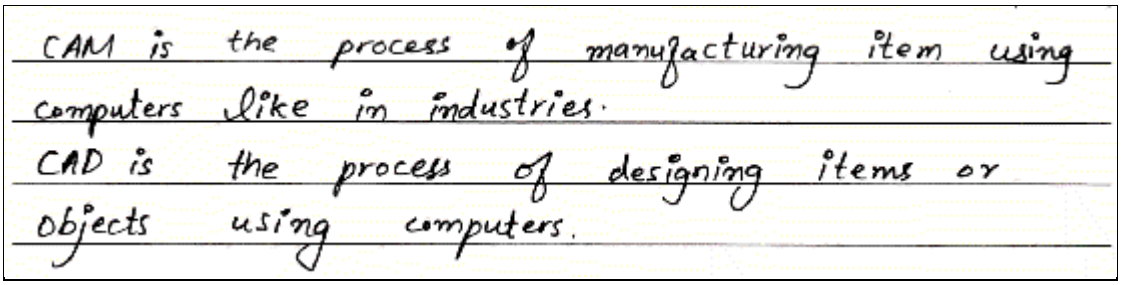


Question 7a:

Differentiate between computer aided manufacturing (CAM) and computer aided design (CAD).

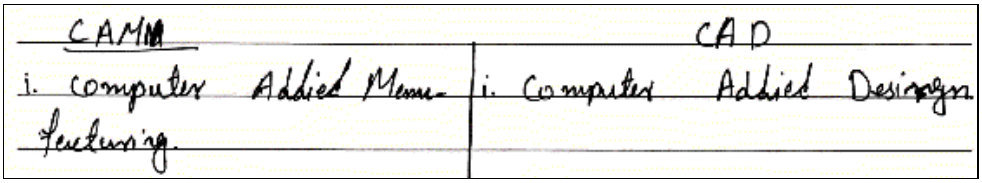
Better responses showed good understanding of CAM and CAD and differentiated these two terms on the basis of their use, e.g. CAD is used to create 2-D or 3-D designs of objects while CAM uses machinery to manufacture three-dimensional products.

Example:



Weaker responses wrote random answers for this question which depicted that candidates had no concept of CAM and CAD. For instance, some of these responses wrote the full forms of CAM and CAD to differentiate them. Other wrote that CAM is a process to make computer parts in factories and CAD allows designing computer by using different methods.

Example:

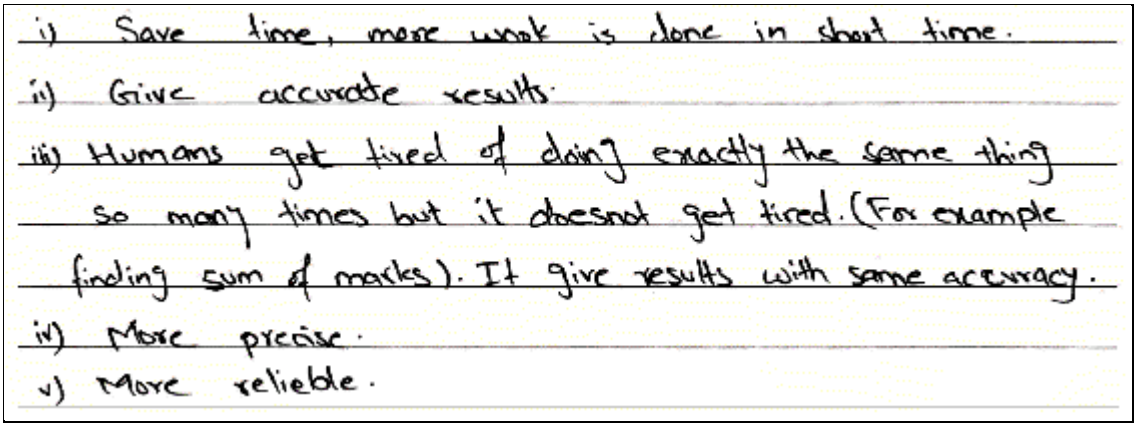


Question 7b:

'Using spreadsheets, instead of calculator, paper and pen, has made the work of statisticians and accountants easier.'
Give any THREE reasons to support the given statement.

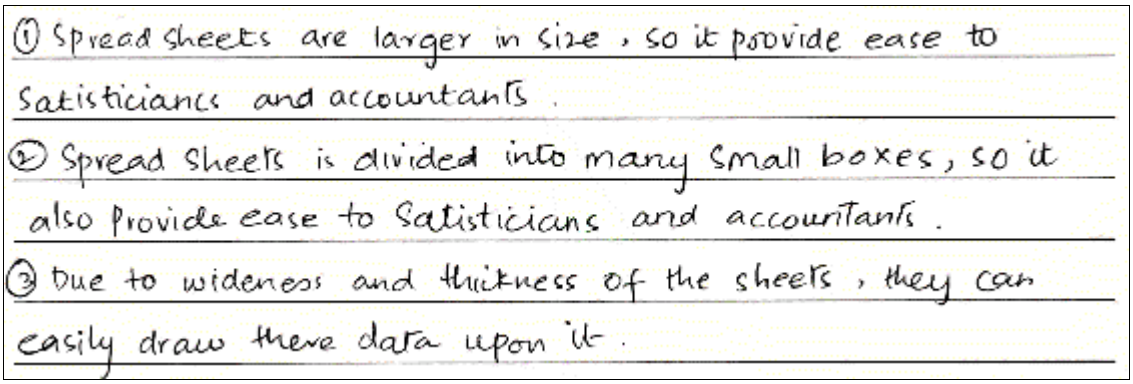
Better responses wrote appropriate reasons to support the statement given in the question, e.g. spreadsheets allow to perform different statistical analysis to predict about future event(s) depending upon previous event(s); built-in functions or commands perform a number of calculations easily; spreadsheets save time; spreadsheets are helpful to solve the what-if questions; they help to perform fast calculation/ they give more accuracy; sorting data is easy/ store large amount of data in one file; there are lesser chances of errors.

Example:


i) Save time, more work is done in short time.
ii) Give accurate results.
iii) Humans get tired of doing exactly the same thing so many times but it doesnot get tired. (For example finding sum of marks). It give results with same accuracy.
iv) More precise.
v) More reliable.

Weaker responses did not understand the question and wrote incorrect reasons, e.g. due to wideness and thickness of the sheets, they can easily draw data upon it; easy to compose result cards; they have low cost; spreadsheet is present on screen so it means paper is there for dust bin.

Example:


① Spread sheets are larger in size, so it provide ease to Satisticians and accountants.
② Spread sheets is divided into many small boxes, so it also provide ease to Satisticians and accountants.
③ Due to wideness and thickness of the sheets, they can easily draw there data upon it.

Question 8:

i. Define the term 'word processor'.

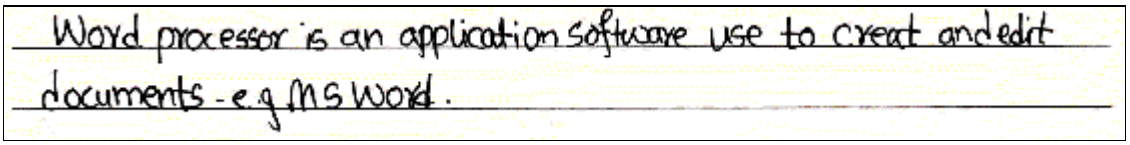
ii. Consider the given blank table.

Write appropriate steps to create this table in MS Word.

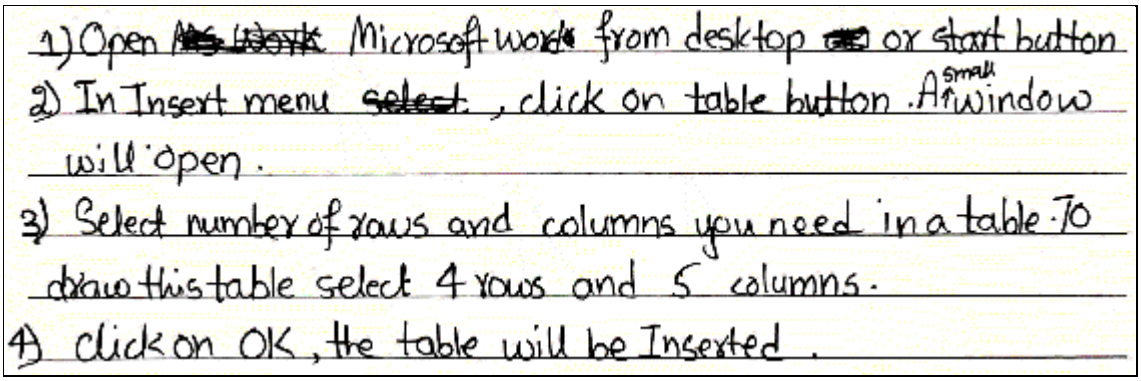
Better responses wrote the correct definition of 'word processor' and demonstrated good understanding of inserting a table in MS Word file.

Example:

(i)



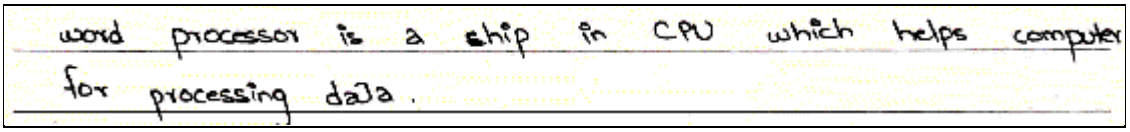
(ii)



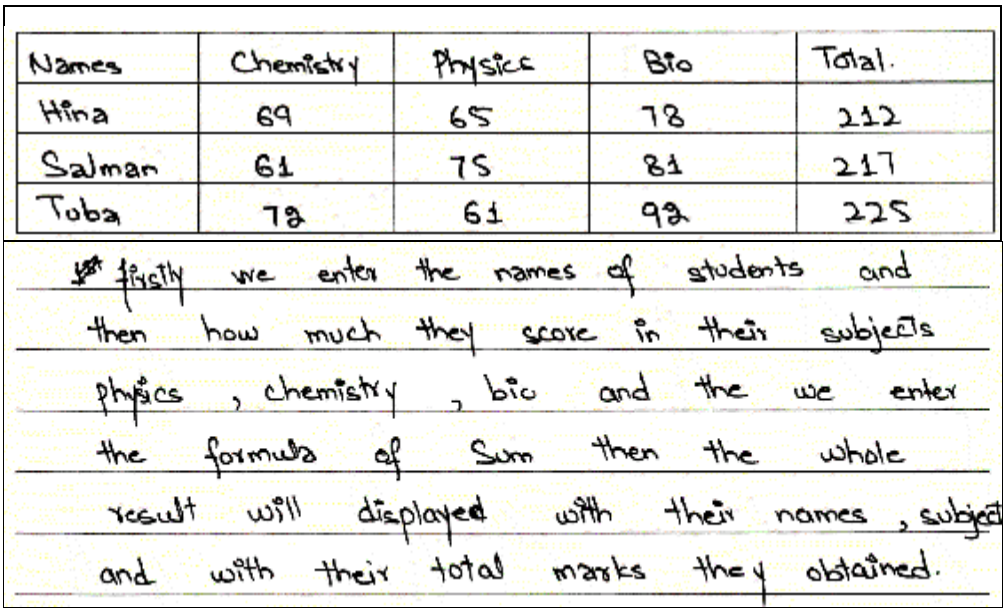
Weaker responses misunderstood the term 'word processor' and defined it as a piece of hardware rather than software. Moreover, these responses showed that candidates did not practice the table insertion in MS word due to which they were not able to write the steps to insert the table given in the question. Likewise, there were some responses that had filled the table and then wrote the random steps to be performed on the table.

Example:

(i)


word processor is a chip in CPU which helps computer for processing data.

(ii)



Names	Chemistry	Physics	Bio	Total.
Hina	69	65	78	212
Salman	61	75	81	217
Toba	78	61	92	225

firstly we enter the names of students and then how much they score in their subjects physics, chemistry, bio and the we enter the formula of Sum then the whole result will displayed with their names, subject and with their total marks they obtained.

Question 9:

Consider the part of MS Excel sheet shown below.

	A	B	C	D	E	F
1	**Cool Dude Boutique**					
2	**Inventory**					
3						
4	**Item**	**Retail Value**	**Discount**	**You Pay**	**Sales Tax**	**Total Price**
5	Dress Shirt	750	140	610	36	646
6	T-Shirt	600	120	480	28	508
7	Pants	800	150	650	42	692
8	Vest	250	30	220	11	231
9	Sweater	1100	200	900	65	965

i. Write MS Excel formula to calculate the average sales tax.

(**Note:** Do not use SUM or AVERAGE functions.)

ii. Write the MS Excel function with appropriate values to retrieve the highest retail value of an item.

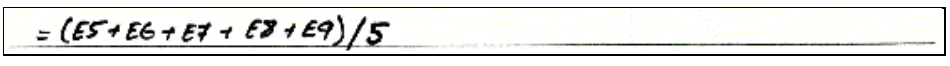
iii. Write the MS Excel function with appropriate values to retrieve the minimum total price of an item.

iv. Write the MS Excel formula to count the number of items having discount value more than 120.

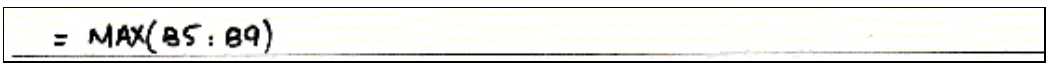
The performance of even *better responses* was average in this question and no candidate obtained full marks which is a major concern. A small percentage of candidates did secure 3 or 4 marks in this question. Most of such responses showed good understanding of calculating average, maximum and minimum values in MS Excel using formulae and functions. However, these responses were not able to use IF and Count to complete the task given in part (iv) of this question.

Example:

(i)

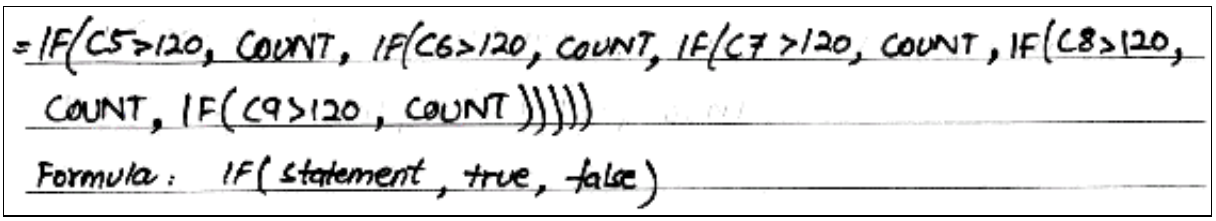


(ii)



(iii)

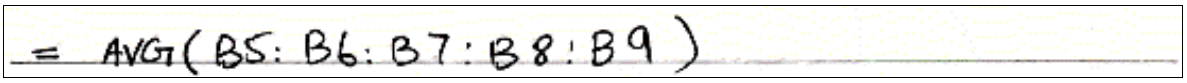
(iv)



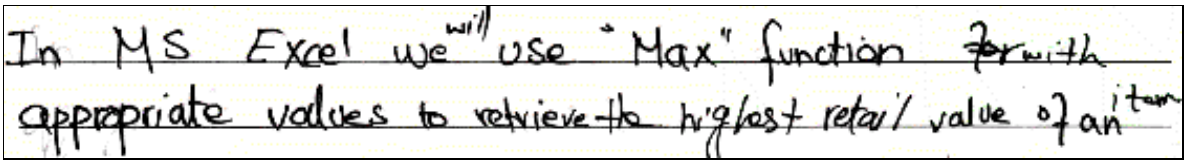
Weaker responses demonstrated lack of MS Excel practice due to which they were not able to write the correct answers of given tasks. Such responses had used SUM and AVERAGE functions to complete task 1; used mathematical symbols instead of using MS Excel formula specific symbols; wrote the name of functions only rather than writing the function along with proper cell range; described the conditions and values in part iv rather than writing the proper IF and Count statement.

Example:

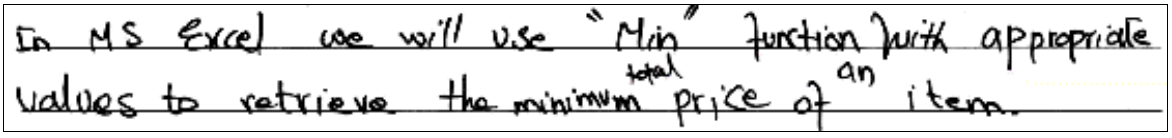
(i)



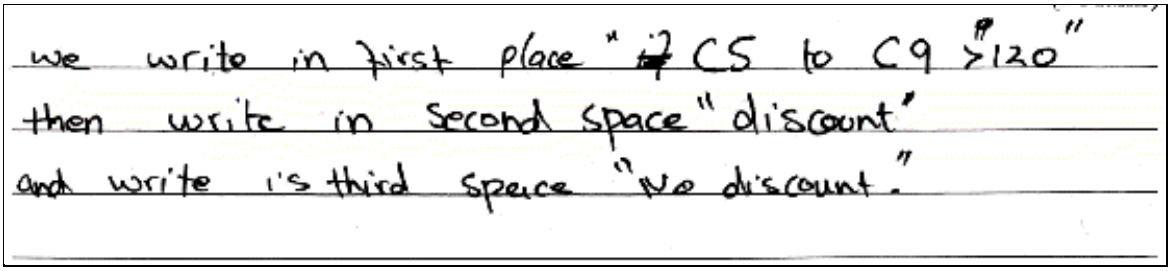
(ii)



(iii)



(iv)

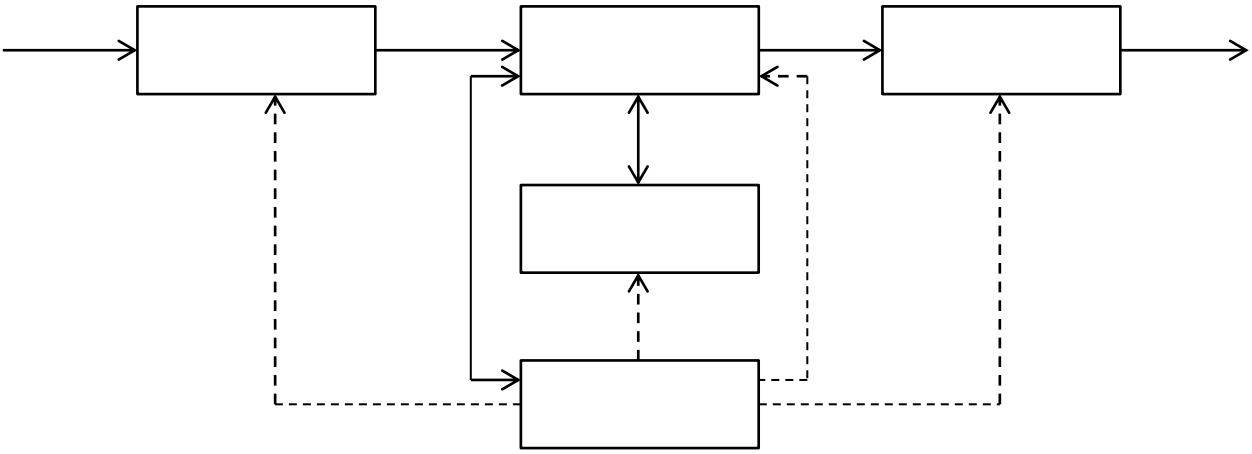


Extended Response Questions (ERQs)

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

Question 10a:

i. Consider the blank block diagram of a computer system shown below.



(**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.

1.	Control unit
2.	Memory unit
3.	Arithmetic logic unit
4.	Register
5.	Input unit
6.	Output unit

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

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

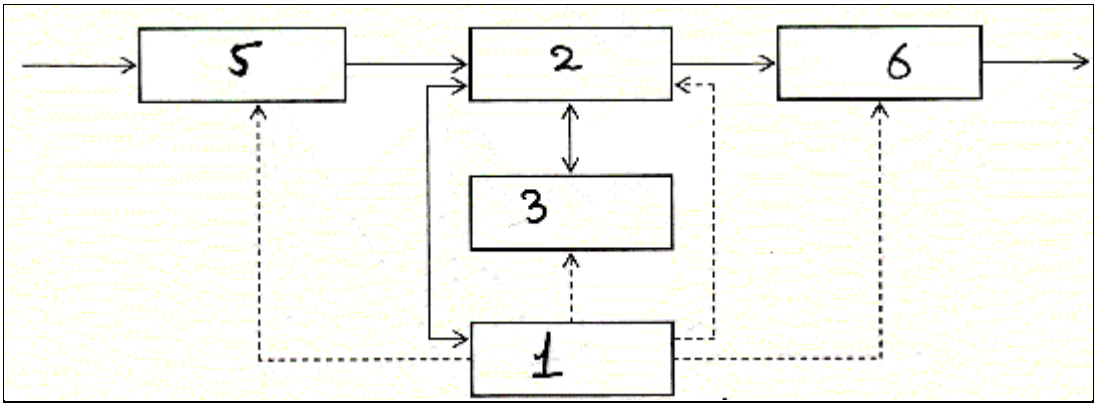
- Data bus
- Address bus
- Control bus

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

Better responses showed good understanding of components of computer system and completed the given block diagram by placing the numbers in correct boxes. Likewise, such responses differentiated between RAM and ROM on the basis of their volatile and non-volatile nature. Similarly, such responses wrote the main purpose of each type of computer bus.

Example:

(i)



(ii)

(ii)
(i) RAM is a volatile memory of computer and ROM is a non-volatile memory compute.

(ii) RAM have removeable instructions but ROM have Permanent instructions.

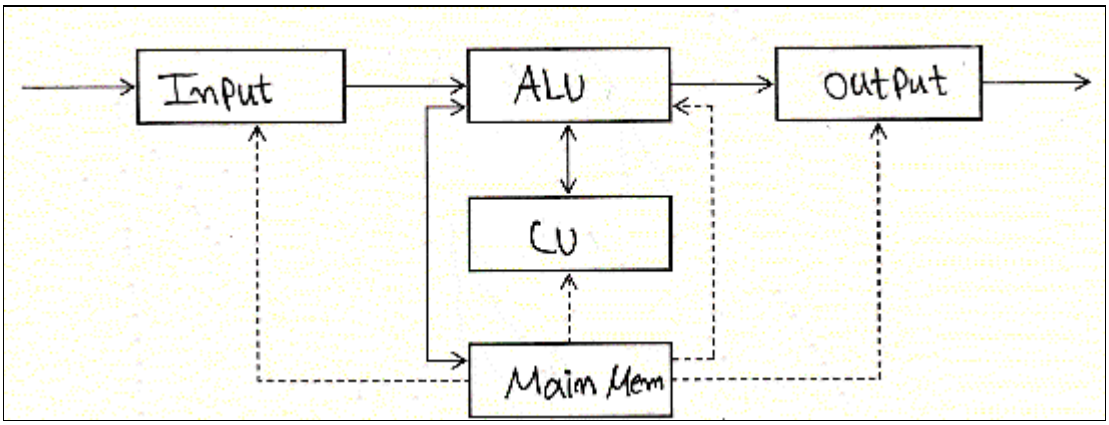
(iii) Data bus:- A type of system bus use to transfer data between different components of system unit on mother bord. it is a bidirection bus. Address bus:- A system bus use to transfer address of data and it is unidirectional means that it only transfer address from cpu to memory or I/O unit.

Control bus: use to transfer control signal to a different components. within the system unit and is a bidirectional bus.

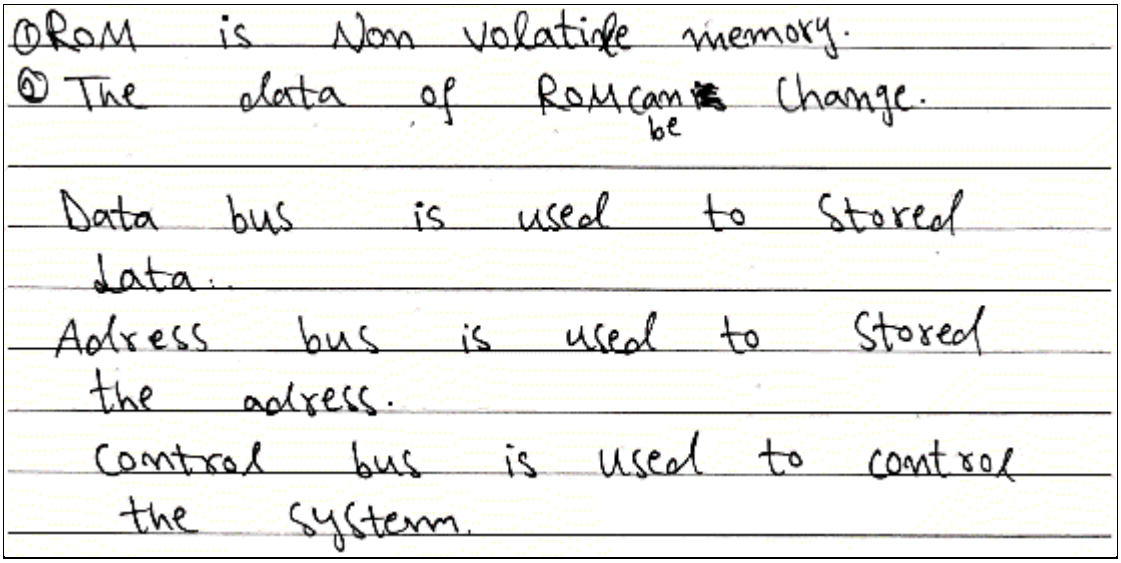
Weaker responses mostly placed the number for input and output unit correctly in the given block diagram. However, such responses could not correctly place the numbers for memory unit, control unit and arithmetic and logic unit in the given block diagram. Similarly, most of these responses could list only one correct difference between RAM and ROM, i.e. RAM is temporary memory and ROM is permanent memory. Likewise, such responses had unclear concepts of computer buses and considered them as storage devices rather than a means to transport address, data and control signals.

Example:

(i)



(ii)



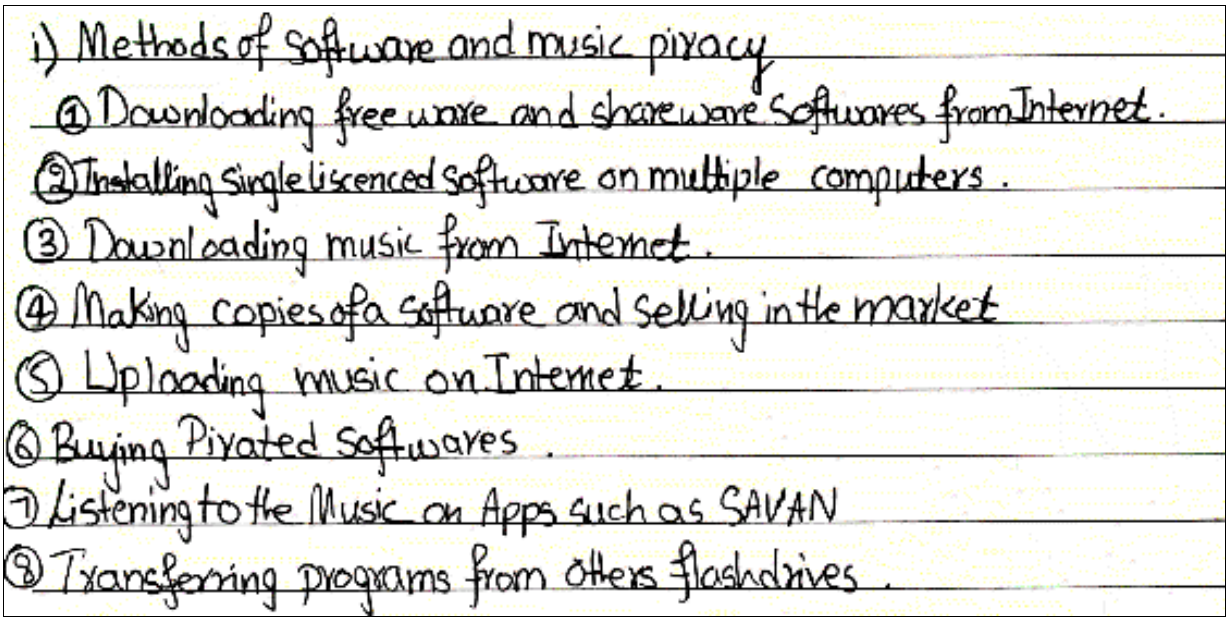
Question 10b:

A large number of computer users do not consider software and music piracy to be theft. More than half of computer users throughout the world admit that they pirate software according to the findings of a recent study conducted by Business Software Alliance (BSA). There is a flourishing business in music and software piracy for gaining illegal financial benefits.

i. Discuss any FIVE different methods of software and music piracy.
ii. How are pirated software harmful to our systems?
iii. Describe any THREE measures that should be taken to minimise piracy.

Better responses depicted good understanding about piracy and wrote different methods of software and music piracy, e.g. downloading licensed software with crack; installing software for use beyond the licensed quantity; sharing music and software with people; using software in geographical regions where it is not allowed. Likewise, these responses wrote specific effects of pirated software to computer system such as pirated software may contain bugs and viruses; users cannot get quality technical support and updates; software developer can sue on legal grounds, etc. Similarly, these responses wrote various measures to minimise piracy, e.g. software companies should reduce the software cost to encourage more people to buy it; make a clear and consistent legal document; increase public education and awareness regarding the harmful effects of pirated software; should only be available through authorised dealers.

Example:


i) Methods of Software and music piracy
① Downloading free ware and share ware Softwares from Internet.
② Installing Single licenced software on multiple computers.
③ Downloading music from Internet.
④ Making copies of a Software and selling in the market
⑤ Uploading music on Internet.
⑥ Buying Pirated Softwares.
⑦ Listening to the Music on Apps such as SAVAN
⑧ Transferring programs from others flashdrives.

ii) ~~these~~ pirated Softwares are harmful as they are having viruses which so using pirated software can ~~can~~ : ① Slow down the speed of computer.

② Format your harddrive and can also delete import files and documents.

③ Display false and political message every few time.

④ Can also make some resources unavailable to the User

⑤ can Corrupt ~~your~~ operating system of computer.

iii) "Measures to minimize piracy"

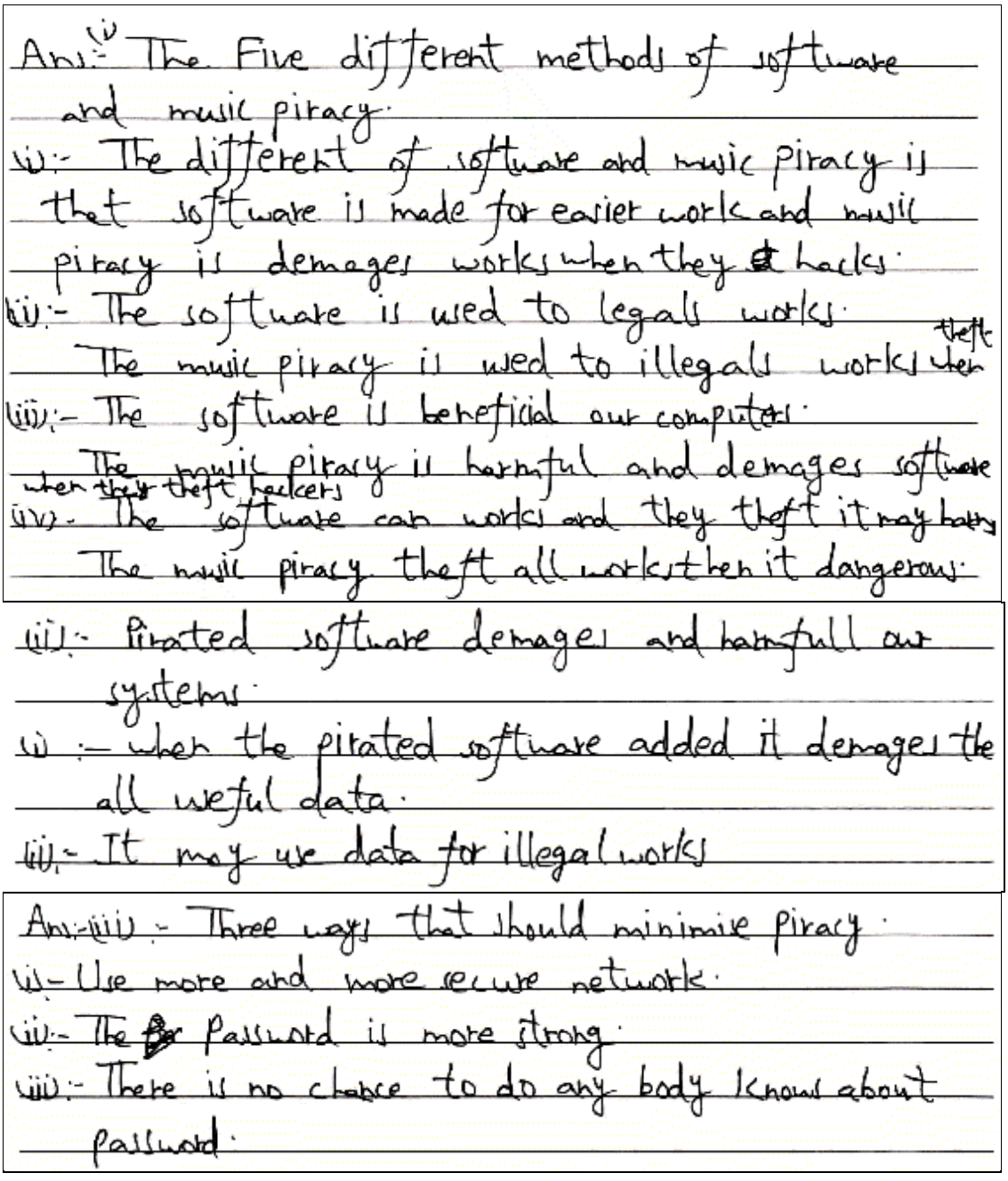
i) Awareness :- People should be give given awareness about the harmful effects of piracy such as security problems.

② Punishment :- Government should make strict laws and should also strictly Implement according to which severe punishments should be given to those who ~~one~~ commit piracy. ③ ethical Citizen :- Every Citizen of a country should be motivated to become ethical Citizen.

④ Companies should increase the security so that no one can pirate the softwares.

Weaker responses showed that most of the candidates understood the question but were not able to communicate their thoughts on the exam paper. Such responses mixed the concept of piracy methods with effects of piracy and measures to prevent piracy. Some of such responses repeated the same statements to fill the given space for answer.

Example:



Ans:- (i) The Five different methods of software and music piracy.
(ii):- The different of software and music piracy is that software is made for easier work and music piracy is demages works when they theft hacks.
(iii):- The software is used to legals works.
The music piracy is used to illegals works then theft
(iii):- The software is beneficial our computers.
The music piracy is harmful and demages software when they theft hackers
(iv):- The software can works and they theft it may harm
The music piracy theft all works then it dangerous.

(ii):- Pirated software demages and harmfull our systems.
(ii) :- when the pirated software added it demages the all useful data.
(iii):- It may use data for illegal works

Ans:-(iii) :- Three ways that should minimize piracy.
(i):- Use more and more secure networks.
(ii):- The Password is more strong.
(iii):- There is no chance to do any body knows about password.