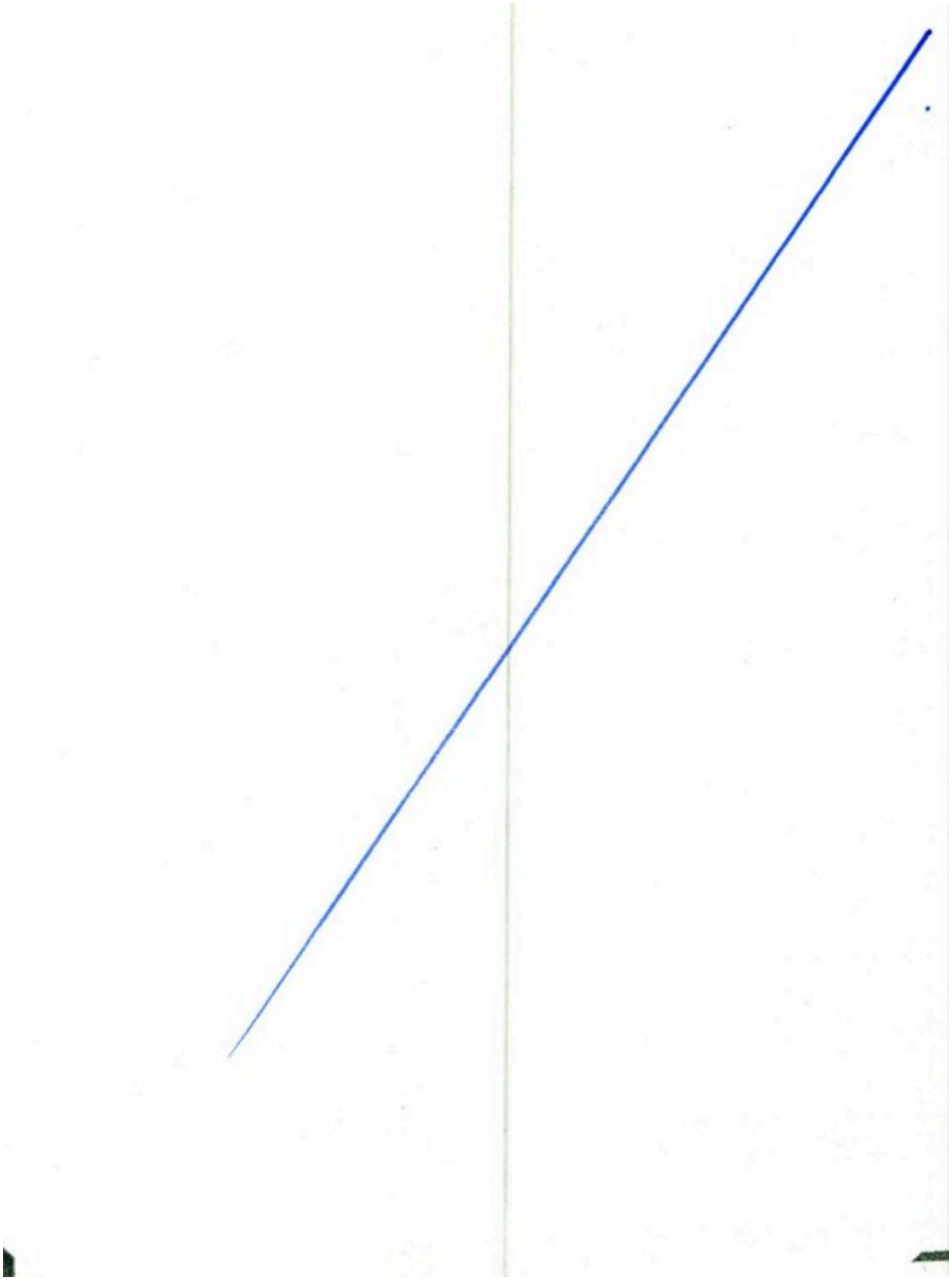
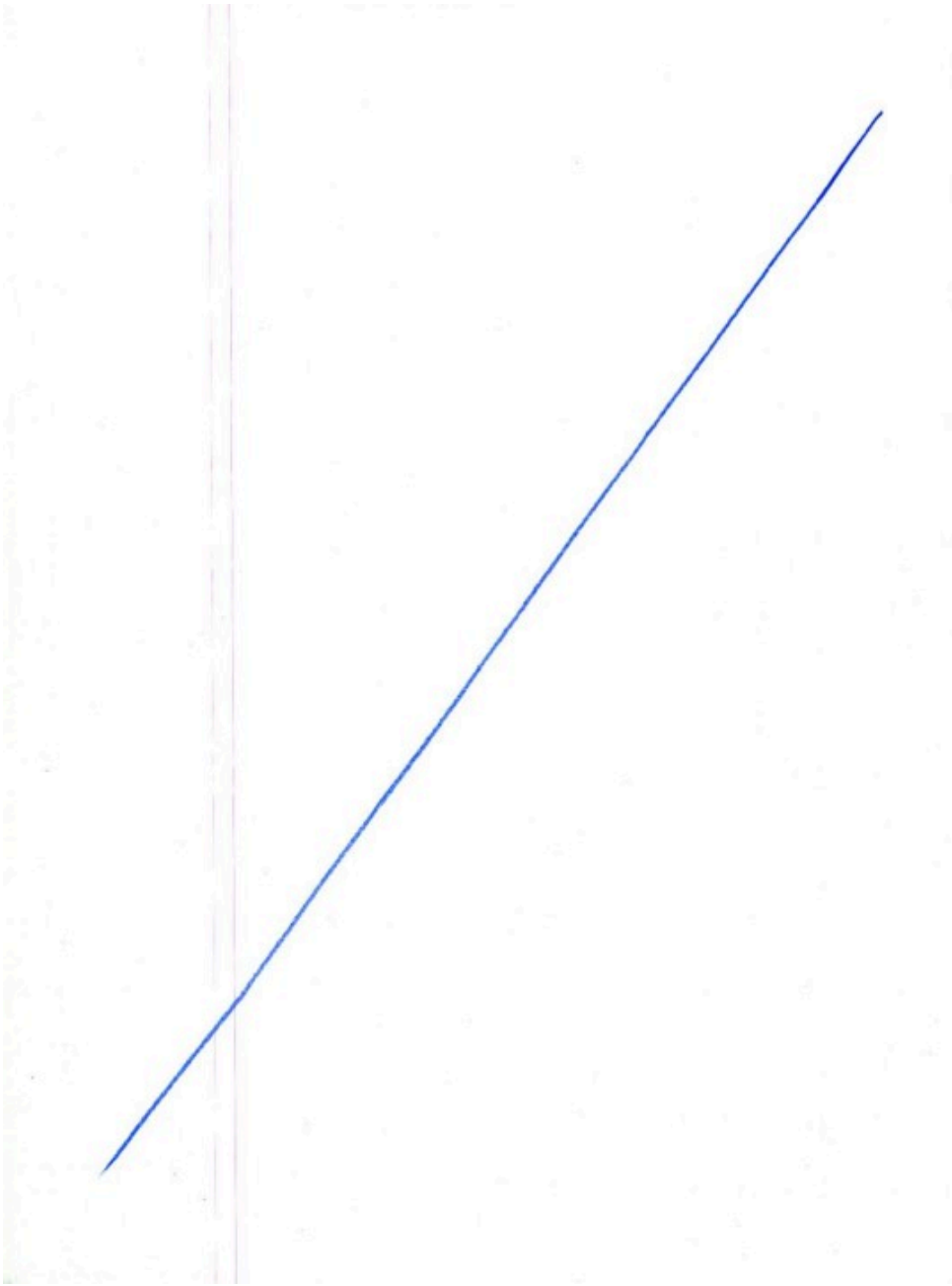
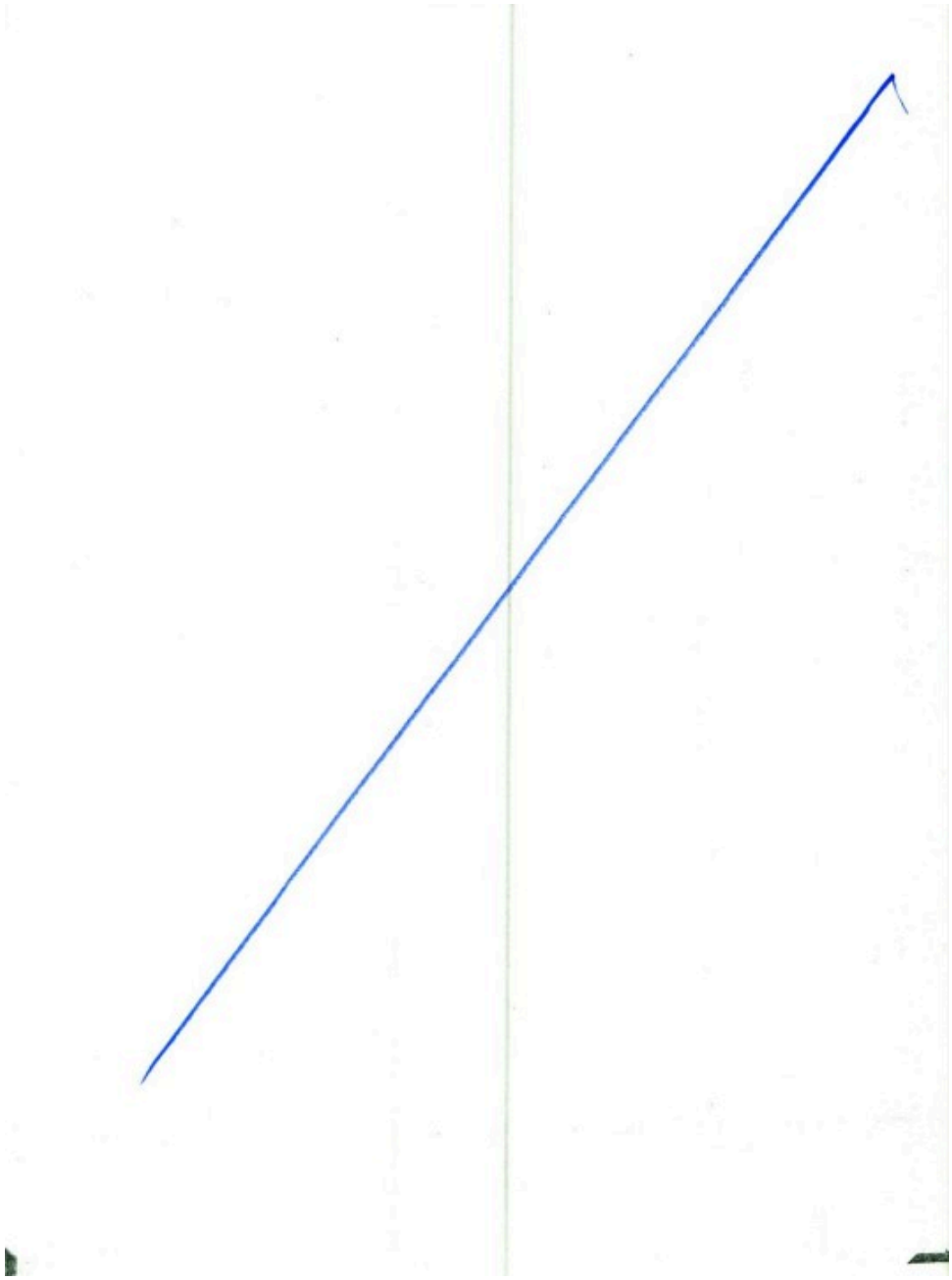






(Section B)

Q. No. 2 Part (i) Write down the ____design.

Answer:-

Key Aspects of Usability: Following are the three key aspects of usability:-

1. **Effectiveness:** The system design must be effective and provide clear and easy solution to the problems.
2. **Efficiency:** The system must be efficient and provide results quickly without delay.
3. **Simplicity:** The system design must be simple and easy to understand without having any complexities.

→ Further Feedback, Error messages, Consistent design etc are also used to enhance usability.

Q. No. 2 Part (ii) Differentiate_____examples.

Answer:-

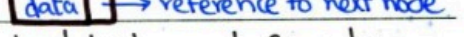
Stack	Queue
1. This works on LIFO (last-In-First-Out) principle.	1. It works on FIFO (First-In-First-Out) principle.
2. The last element inserted is taken out fir t.	2. The first element inserted is taken out first.
3. It has functions as Push, Pop, Top etc	3. It has functions as Enqueue, dequeue, Front etc
4. **Real life Example:** → The stack of plates. The last plate placed is taken out first.	4. **Real Life Example:** →A Queue on a ticket counter. The first person is searved first.

(Section B)

Q. No. 2 Part (iii) What is ___ advantages.

Answer:-

- **Linked list:-** The linked list can contain data of any kind and has the data and reference to the next node.



- Singly linked list, Doubly linked list and Circular linked list are its three types.
- **Advantages:** Following are its advantages:-

1. It can contain data of various datatypes.
2. It contains information of data and reference to the next node.
3. It occupies less memory space.
4. Is fast and has direction.
5. Has different arrangements for various uses.

.....

Q. No. 2 Part (iv) Why ____ discuss.

Answer:-

- **Importance of learnability in HCI:-**

Learnability is important in Human-Computer Interaction (HCI) as the system must be easily learnable to avoid user frustration and lack of interest. There should be guidance or demo to display how to use the app to make it essy for users to work on.

i.e: The banking app providing short video to show how it is used making learning essy.

- Learnability enhances user interaction making them to use apps most frequently.

(Section B)

Q. No. 2 Part (v) Differentiate ..... cryptography.

Answer:-

Symmetric Cryptography	Asymmetric Cryptography
1. The symmetric cryptography encrypts and decrypts data using a single secret key.	1. The asymmetric cryptography encrypts and decrypts data using different public and private keys.
2. The secure channel is required for key transmition	2. There is no need for secure channel to create.
3. Easy for handling large data sets. because fast.	3. Easy for handling small data sets. because slow.
4. Doesnot require complex mathematical computations.	4. It requires complex computations.

.....

Q. No. 2 Part (vi) What is .... solutions?

Answer:-

Time Complexity	Space Complexity
1. Time complexity refers to the time taken to solve a problem in computational solutions.	1. Space complexity refers to memory/space used during solution in computational solutions.
2. The more time taken decreases the efficiency and vice versa.	2. The more space taken decreases the efficiency and vice versa.
3. It is used to evaluate the efficiency of system.	3. It is also used to evaluate efficiency but interms of space.
4. i.e: Binary search has time complexity of O(logn).	4. i.e: Binary search has space complexity of O(logn).

(Section B)

Q. No. 2 Part (vii) How two ---- discuss.

Answer:-

• **Two-Factor Authentication (2FA):** The 2FA uses two different methods for security. The use of two different and complex methods enhences privacy and security for users. It combines two methods as biometric (finger-print or face identification etc) and OTP (one time code/password).

→ **Strong protection:** It uses different techniques to provide strong protection to users.

→ **Enhance privacy:** By using different strong methods it enhences privacy making it difficult for hackers to take access.

Q. No. 2 Part (viii) Write down --- Queue.

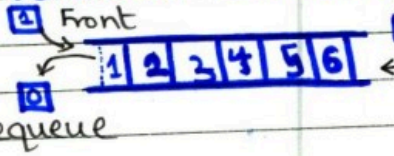
Answer:-

• **Purpose of Functions in Queue:-**

→ **Enqueue:** It is the function that is used to add another element to the ent of the queue.

→ **Dequeue:** It is the function that is used to remove an element from the start of the queue.

→ **Front:** The front is used to return an element without removing it.



(Section B)

Q. No. 2 Part (ix) How ___ Python?

Answer:-

• Opening and Closing of file:-

→ **Open a file:**

The file must be present in the system.

⇒ file = open('abc.txt','r')

⇒ file.read()

Iti will open a file in reed mode.

→ **Close a file:**

The file must be closed sperately after being used. but using with do not need a seperate line.

⇒ file = open('abc.txt','r')

⇒ file.read()

⇒ file.close()

Q. No. 2 Part (x) How can ___ usability?

Answer:-

• Improve a website's usability:-

The A/B testing is used to improve a website's usability as it provides two different versions of website divided or provided to different peopt to check which version is better in terms of usability. The website's usability is improved by this as developer comes to know which version is best and better. It allows to check which version is more suitable and will improve usability.

(Section B)

Q. No. 2 Part (xi) Briefly ---- example.

Answer:-

• Cipher methods:-

→ Ceaser Cipher:-

Ceaser Cipher is one of the cipher methods used in cryptography that shifts an alphabet by a fixed position in the alphabets that encrypts the data by hiding the real information and protecting it.

• Example:- If we set the shift to 3 then every alphebet will have different corresponding alphabet as 'A' will be 'D' and 'B' will be 'E' and so on.

.....

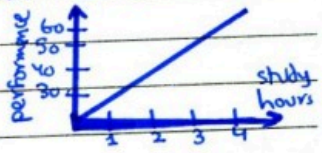
Q. No. 2 Part (xii) How can ---- example.

Answer:-

• Use of digital tools:-

→ Engage diverse audience: The digital tools as charts, graphs, tables etc are used to engage diverse audience from different backgrounds having different perspectives. It makes complex data easy, enhance understanding, improve desision making etc.

• Example:- A graph drawn afinst time hours for study and result or student performance the graph shows increasing time increases performence. Easily understood.



(Section B)

Q. No. 2 Part (xiii) Briefly ---- application.

Answer:-

• **Concept of Blockchain:-**

→ **Blockchain:** A blockchain is a **digital ledger** in which blocks are **connected** to one another using **cryptography** offering secure, immutable transactions and information. It is a secure network technology.

→ **One Application:** Blockchain technology is used in various field as it is used in **Voting System** that ensures secure and unchenged results. It gains users confidence as the results cannot be chenged if it is used.

Q. No. 2 Part (xiv) How --- reasons.

Answer:-

• **IoT in helping control Air pollution:-**

IoT can be widely used in controlling air pollution by using different technology available.

→ **Reasons:**

1. Sensors are installed in different locations to check as if the condition get worse the alerts are given to improve condition.
2. Different cameras are installed to check various locations are clear or not.
3. In factories emitting gases are checked and controlling conditions are implemented.

(Section C)

Q. No. 3 (Page 1) Explain ____ each.

Answer:-

→ Human Computer Interaction (HCI):-

Human Computer Interaction (HCI) means when the humans interact with the system or computer to solve problems. It consists of:

- Users
- Tasks
- Interface
- Environment

→ Common Problems:-

Their are several common problems occuring due to poor human computer interaction. Following are some of them:-

1. Poor Interface/Complex Interface:-

The interface is the main point of interaction between the humans and computers. The interface must be simple, easy to use and should not contain extra complex details. The interface if simple and easy reduces user frustration and abandoning of the app or system overall. The interface if complex may have various problems as user may get frustrated and

(Section C)

Q. No. 3 (Page 2) donot find specific option and abandons the app overall.

• Example:-

→ A banking app consisting of a lot of options in the homepage and containg each and every task with complex layout confusing the user making them difficult to find withdrawl option and overall abandoning the app results.

2. Accessability Issues:-

The system or app must be designed in a way that is accessable by every single user on the Earth. The user or developer must make the app very simple with alternating options to increase accessability. If an app or website doesnot contain alt option for voice it will be difficult for hearing disable's to cater with the content. Similarly if the website doesnot have cleer visibility having low contrast reducing the accessability for visually impaired people. By not considering these issues remove a huge group from the population.

• Example:-

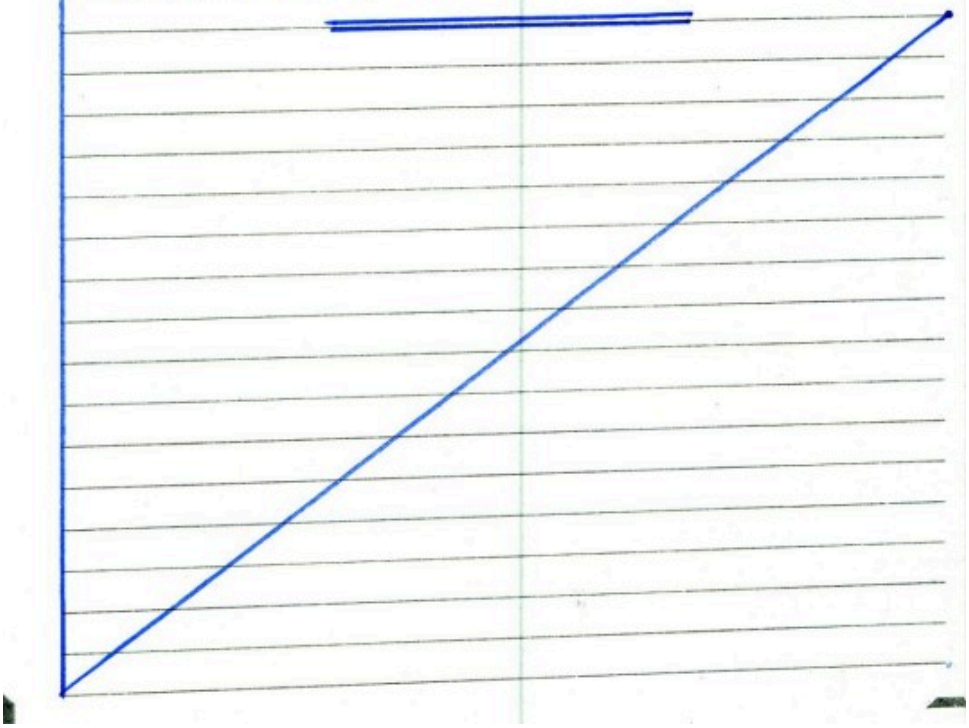
→ Consider an app having no alt option and it doesnot provide

(Section C)

Q. No. 3 (Page 3) captions for audio then it will be difficult for hearing impaired people to have access to the system or content as they are unable to even identify the content.

•Conclusion:-

There are several issues which arise but the main goal is to look after issues to improve the interaction. The issues are Performence issues, errror messages etc. which reduces HCI performence.



(Section C)

Q. No. 4 (Page 1) Explain the ----each.

Answer:-

→ Tree traversal methods:-

• **Tree traversal:-**

The tree traversal method consists of nodes connected to each other. The node are connected to further nodes. The main node is called root node and the next layer are parent node and the connected nodes are children nodes and with no children such are called leaf nodes.

• Types:

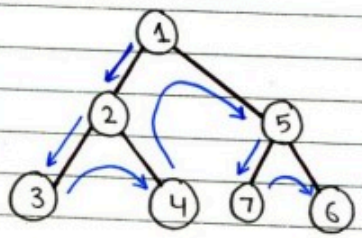
1. In-order
2. Pre-order
3. Post-order.

Pre-order:-

In this order / method the following nodes are visited as:-

1. Root node
2. left nodes
3. Right nodes.

→ **Example:-**



(Section C)

Q. No. 4 (Page 2) 1,2,3,4,5,7,6

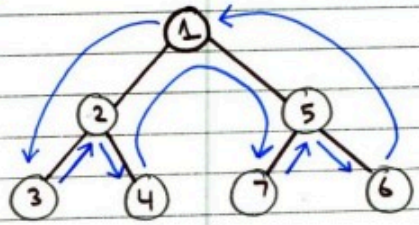
In this first the root node is visited after that left nodes and at end the right nodes are visited.

Post-order:-

In this post order or method the nodes are visited in following methodf sequence:-

1. Left nodes
2. Right nodes
3. Root node

→ **Example:-**



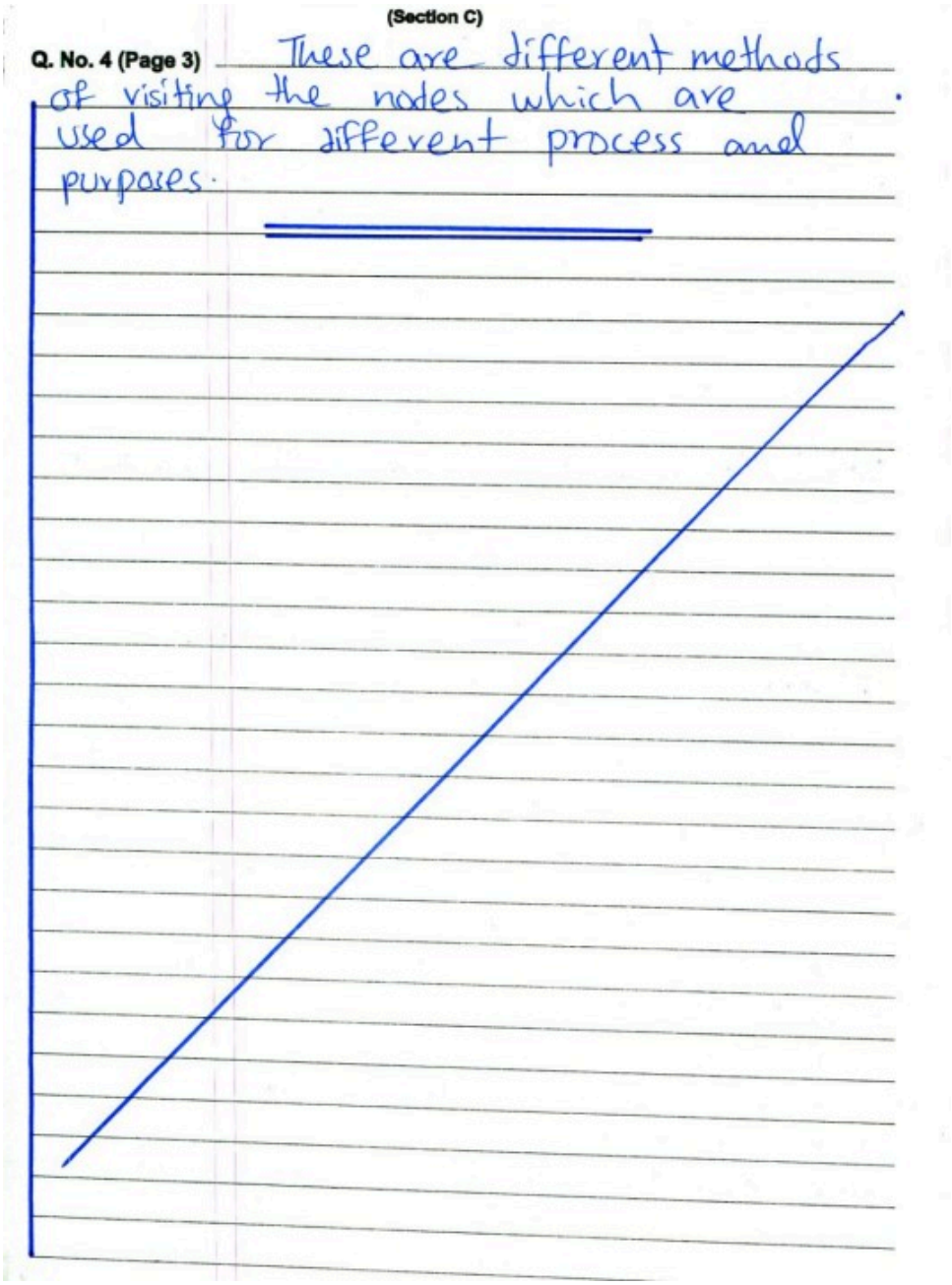
3,2,4,7,5,6,1

In this the left nodes are visited first then right and atthe end the root node is visited. This visits the root node at the end.

• **Conclusion:-**

(Section C)

Q. No. 4 (Page 3) These are different methods of visiting the nodes which are used for different process and purposes.



(Section C)

Q. No. 5 (Page 1) Explain ____ organizations.

Answer:-

→ Cyberattacks that threaten the individuals:-

There are a lot of cyber attacks that threaten the individuals by having unauthorized access to their personal information. Following are some of them:-

1. Distributed Denial of Service (DDoS):-

Distributed Denial of Service is a kind of cyberattack that makes several corrupted or infected system work together to provide **huge traffic** to a system and unabling the user to perform several tasks. The users performance is slowed down as a lot of traffic is given to it.

There are several messure that can be taken to solve DDoS problem.

- **Example:-**

A person working on a system suddenly notices a slowdown on system unabling him/her to perform tasks efficiently and quickly it is due to DDoS.

(Section C)

Q. No. 5 (Page 2) **2. Ransomware:-**

Ransomeware is also a cyberattack that threaten the security and privacy of individuals and organizations by hacking the personal in-fomation of user. The hacker hacks and locks/encrypts the personal information of users and ask for ransome amount. to provide the decryption key. The system is hacked and when the hacker is provided with the ransome the decryption key is given but it is not sure that the data will be retured or not. Their is no garentee for backup.

•Example:-

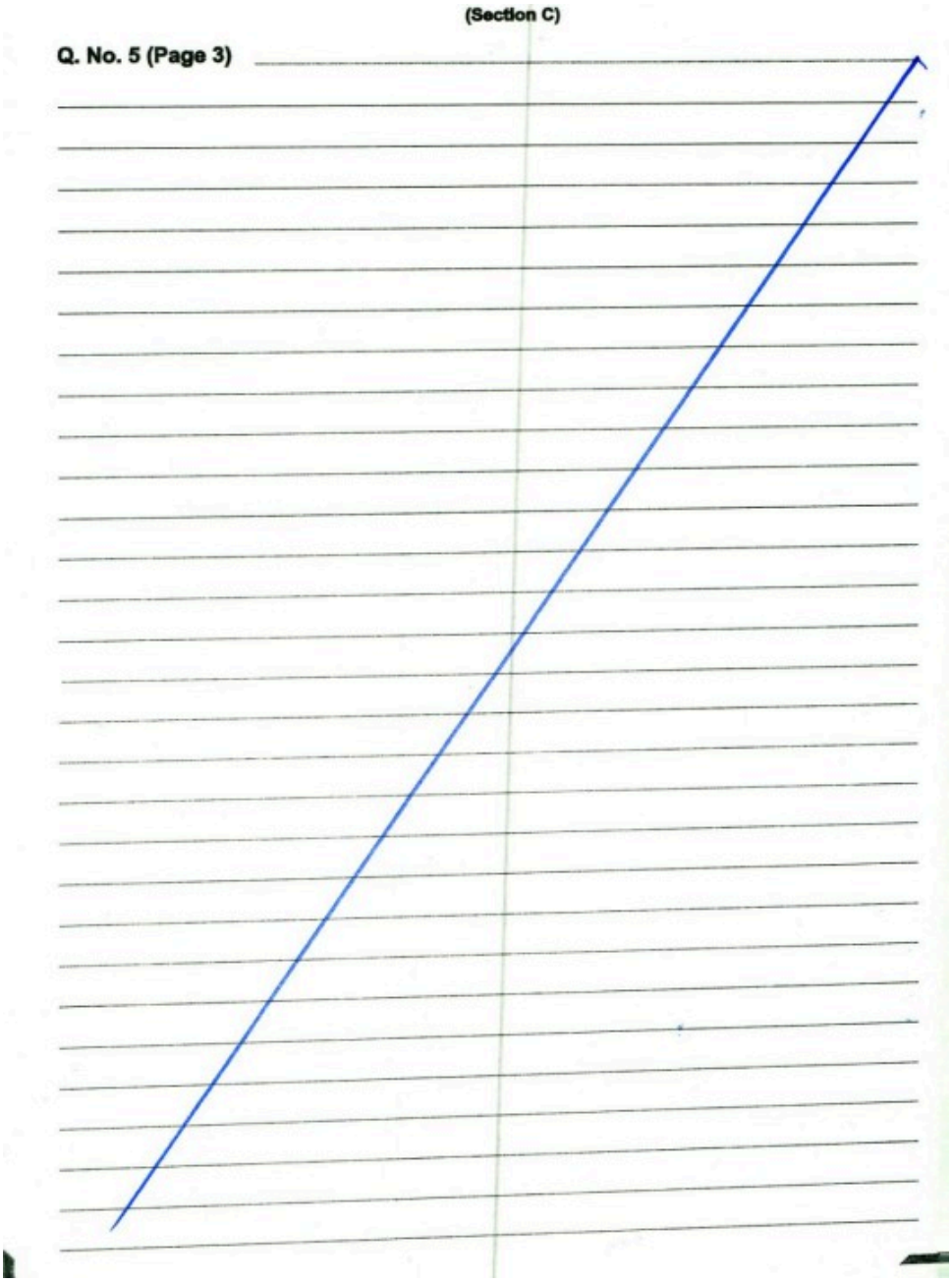
A users personal information is hacked and ransom is asked by hacker to provide the decryption key if the ransom is even given their is no proff that the data will be returned.

•Conclusion:

Their are different cyberattacks which are covered or solved by different methods. The attacks are solved by cybersecurity measures implementation.

(Section C)

Q. No. 5 (Page 3)



(Section C)

Q. No. 6 (Page 1) How is ____network.

Answer:-

→ Neural network:-

• Neural network trained:-

The neural networks are trained by providing them with different training data They have neurons functioning that extracts patterns and learn them by themselves. The patterns are learned by them and their performence is improved by training them rapidly. Training data is used to extract patterns and solve complex problems ~~to~~ like humans.

• Feedforward propagation:-

As neural network has three layers input, output, and hidden layers. The complex problem goes through each of the layer and then provide answer. first the input layer enters the input of the problem then hidden layers are present that check if the answer can be moved and if can be solved further as if the value is greater the input is moved forward and processed. And after that their is an output layer

(Section C)

Q. No. 6 (Page 2) that represents the output and the output is given after the processing of the whole complex problem.

- **Backpropagation:-**

In the back propagation the flow is reversed. The output is checked as if it matches the actual output predicted. In backpropagation the output is reversed and flow start from output layer then it moves forward towards the hidden layers and after reverse calculations and evaluations the next it moves to input layer and the value is checked at the initial stage as if the predicted value matches with the calculated value and as if it matches then the results are correct and the calculations are accurate.

- **Conclusion:-**

The neural network is trained through identification of patterns and making an educated guess of answers. The backpropagation and feed-forward propagation are used to

(Section C)

Q. No. 6 (Page 3) check and identify results and flow of the solving technique through layers.

