Subject: Computer Science Class: VIII

L-1 NETWORKING FUNDAMENTALS

Do it yourself 1A:

Answer the following questions:

1. **What do you mean by resource sharing?**

Ans: Resource sharing means one device accessed by many systems. You can observe that only one printer in the lab will be shared with all the students, and this is possible only because of the computer network.

2. **The computer teacher has assigned a project to Sneha and Priyanka. Due to some emergency, priyanka has to go to New Zealand. How will Priyanka and Sneha complete their project together on time?**

Ans: Through file sharing.

3. **Suppose there is only one scanner in your computer lab at school. All the subject teachers want to scan their documents while sitting at their own computers in the computer lab. Is this one scanner sufficient, or is there a need for a separate scanner for every computer?**

Ans: One scanner is sufficient since computer networks allow resource sharing.

Do it yourself 1B:

1. Fill in the blanks:

a. **Modem** is a device that converts one type of signal to another**.**

b. **Ethernet Networking cable** is used to connect multiple computers and devices directly to the network using cables**.**

2. Name different computer network devices.

NIC, ENC, Modem, Hub, Switch, Router

Do it yourself 1C:

1. Match the protocols with their functions:

HTTP (Hypertext Transfer Protocol)	Used to send emails between computers	**2**
SMTP (Simple Mail Transfer Protocol)	Transfer data such as text, images and videos over the WWW	**1**
IMAP (Internet Message Access Protocol)	Transfer files from one computer to another over a network	**4**
FTP (File Transfer Protocol)	Retrieves emails and is essential for email applications	**3**

2. Select the correct network type for each description:

a. **PAN** connects devices and smart phones within a 10-meter range in a small area.

b. **LAN** links devices within a school or office, covering between 100 and 1000 meters.

c. **MAN** connects networks within a city or town, spanning up to 100 kilometers.

d. **WAN** connects devices across countries and continents, like the internet.

Chapter Checkup:

A. Fill in the blanks:

1. **Computer network** is a group of two or more computers connected to exchange information/data and to share resources.
2. In a **bus** topology, all the nodes are connected to a single common cable.
3. **MAN** connects devices within a city or a small town.
4. Data **inconsistency** means when same data exists in different formats at different places.
5. **Antivirus** software scans all the drives of computers to detect any malicious virus in the computer.

B. Tick the (✓) the Correct option:

1. Which of the following is not an advantage of a computer network?

a. Cost reduction
b. Less data redundancy
✓**c. High maintenance cost**
d. Less data inconsistency

2. A computer network is a group of two or more computers connected together to exchange _____ and to share _____.

✓ **a. Data, Resources** b. Devices, Secrets

c. Software, connections d. Hardware, Communication lines

3. Data _____ occurs when the same piece of data exists at multiple places.

a. Inconsistency b. Differentiation c. Consistency ✓**d. Redundancy**

4. Which of the following is not a network topology?

✓**a. LAN** b. Star c. Mesh d. Hybrid

5. A _____ routes the data on a network.

a. Hub b. Switch ✓**c. Router** d. Gateway

C. Write T for True and F for False:

1. MAN is costlier than LAN. **True**

2. PAN connects people across the globe. **False**

3. Hub uses only a single port. **False**

4. No data recovery is possible in case of computer networks communication. **False**

5. There is no single point of failure in case of mesh topology. **False**

D. Answer the following:

1. Define WAN.

Ans. WAN (Wide Area Network) connects computers from various countries and continents. WAN connects different LANs and MANs from across the globe. The internet is an example of a WAN.

2. Write the advantages of computer network?

Ans. There are many advantages of computer networks, like security, reducing data inconsistency, less data redundancy, and communication.

3. Explain the term hub and repeater?

Ans. A hub is a networking device that transmits the received information to all the devices on the network. A router is a device which routes the data or information over a network.

4. Discuss star topology and state one disadvantage of it?

Ans. In star topology, the nodes are connected to a centralised hub, switch, or a computer, forming a star. The central computer is called the server, while other computers are called the clients. The disadvantage of the star topology is that if the central computer fails, the whole network will be disabled.

5. Differentiate between bus and ring topologies.

Ans.

Bus Topology	Ring Topology
In a bus topology, all the nodes are connected to a single common cable.	In ring topology, the nodes are connected to each other, forming a ring.
A node puts a message on the cable that is sent to all other nodes in a network.	A node forwards the message received from the previous node to the following node.

L-2 CYBER ETHICS AND SAFETY

Do it yourself 2A:

Match the following:

Spamming	Pretending to be a reliable source in order to trick others into disclosing their passwords or personal information	**2**
Phishing	Sending emails or messages that are meaningless and unnecessary	**1**
Identify theft	When an unauthorised person tries to access a computer system, a network, or data	**4**
Hacking	Stealing someone's personal information to commite fraud	**3**

Do it yourself 2B:

Tick the activity that will contribute to the digital footprint:

1. Shopping for a school bag. ☑
2. Posting a comment on a friend's picture on social media. ☑
3. Watching a movie on television. ☐
4. Searching for a topic on the internet. ☑
5. Talking to a friend over the phone. ☐

Chapter Checkup:

A. Fill in the blanks:

1. **Cyberbullying** is the act of using digital platforms to harass, scare or harm others.
2. Plagiarism involves using someones else's work or ideas without proper **permission**.
3. Phishing is a deceptive online practice that aims to trick individuals into revealing **sensitive** information.
4. Cyberstalking is an illegal and **harmful** internet activity.
5. **Identity** theft happens when someone pretends to be someone else.

B. Tick the (✓) the Correct option.

1. What is the primary goal of phishing attacks?
   a. To promote online safety
   ✓**b. To imitate trusted entities**
   c. To spread awareness about cybersecurity
   d. To encourage ethical hacking
2. Which of the following is an ethical practice?
   a. Identify theft
   ✓**b. Ethical hacking**
   c. Plagiarism
   d. Cuberbulling
3. What is the purpose of digital footprints?
   a. to hide your online activities
   ✓**b. to track online actions**
   c. to protect your identity
   d. to stop online communication
4. What is the main reason behind identity theft?
   a. Drive for fame
   b. Requirement for social interaction
   ✓ **c. Financial gain and dishonest behaviour**
   d. Individual curiosity
5. What is the meaning of the term "digital citizenship"?
   a. Being a citizen of a digital nation
   b. Owning a digital service
   ✓**c. Acting ethically and responsibly online**
   d. Having a digital footprint

C. Who AM I?

1. Protecting every person's data. **Digital Citizen**
2. Being kind to others online. **Online Etiquette**
3. It is the act of harassing someone online. **Cyberbullying**
4. It is the act of copying another person's work. **Plagiarism**
5. Traces of your online behaviour. **Digital Footprints**

D. Write T for True and F for False:

1. Cyberstalking involves constantly monitoring someone's online activities. **True**
2. Spamming refers to sending unwanted emails for promotional purposes. **True**
3. Digital footprints cannot be traced to a specific person. **False**
4. If you have strong passwords, online security precautions are unnecessary. **True**
5. Plagiarism is defined as the act of copying another person's idea, work, or content without giving proper credit or permission. **False**

E. Answer the following questions:

1. **What do you mean by cyberbulling?**

Ans: Using the internet to harass, scare, or hurt people is referred to as cyberbulling.

2. Explain the concept of digital citizenship and why it is important for young internet users.

Ans: Digital citizenship is the term used to describe the ethical and responsible use of technology. Digital citizenship is important for young internet users because, by engaging in good digital citizenship, they help create a more secure and civilized online community for everyone.

3. List three online safety measures that can help protect your personal information and privacy.

Ans: Three online safety measures that can help protect personal information and privacy are:

a. **Use Secure Passwords:** Create strong, challenging passwords for each of your accounts and change them frequently. Use a combination of symbols, numbers, and letters.

b. **Protect Personal Information:** Exercise caution while disclosing personal information on websites and social media. Do not disclose too much personal information to the public.

c. **Privacy Settings:** Limit who can view your information, review and modify the privacy settings on social media sites and online accounts.

4. Define the term "Intellectual property".

Ans: Intellectual property refers to the ownership and protection of creative and unique ideas, inventions, and digital works over the internet.

5. What are the advantages of Cyber Ethics?

Ans: The advantages of cyber ethics are:

i. **Privacy Safeguards:** Cyber ethics emphasises on protecting people's privacy online. This includes respecting user consent, handling sensitive data securely, and preventing unauthorised access or data breaches.

ii. **Online Behaviour:** Cyber ethics promotes respectful and responsible online communication. This involves refraining from cyberbullying and other harmful types of behaviour.

iii. **Digital Security:** Intellectual property refers to the ownership and protection of creative and unique ideas, inventions, and digital works over the internet. It is very important to respect and not use people's digital work online, such as videos, music, and software, without permission.

iv. **Bridging the Digital Divide:** Not all sections of society have the same access to technology. The poor, for example, have limited access. Ethical use of technology promotes equitable access to technology for all members of society.

v. **Accountability:** People and organisations need to be accountable for their online behaviour in the digital age. This includes taking responsibility for errors, making changes for harm done, and upholding moral principles in all online activities.

L-3 INTRODUCTION TO BLOCKCHAIN

Do it yourself 3A:

1. Tick the (✓) the Correct option:

(i) What is a blockchain?

a. A type of physical network
b. A digital puzzle
✓c. A decentralized digital book of records
d. A type of computer

2. Write T for True and F for False:

a. A blockchain is controlled by a single central authority. **False**
b. Different blockchains may be different. **True**
c. Different countries have the same laws related to blockchain. **False**
d. The information stored in blocks can easily be accessed by anyone who has access to the blockchain. **True**

3. Imagine your school starts using blockchain for the enrire exam process. Thus, there will be different blocks for creating question paper, conducting exams, and announcing results. Will you be able to change your marks in the system without the teacher knowing? **No**

Do it yourself 3B:

1. **Match the following:**

Term	Description	
Cryptocurrency	Physical coin and banknotes used for buying	**3**
Bitcoin	Digital currency that works on blockchain	**1**
Traditional Currency	A famous example of a cryptocurrency	**2**

2. Compare traditional currencies (like INR, USD) with cryptocurrencies (like bitcoin). List at least two similarities and two differences between them.

Ans: Similarities:

a. Both traditional currencies and cryptocurrencies can be used as a medium of exchange for goods and services.
b. Both are subject to market forces (supply and demand) that influence their value.

Differences:

a. Traditional currencies are typically issued and regulated by a central authority (like a central bank), while cryptocurrencies are often decentralized and operate without a central authority.
b. Traditional currencies are physical or represented digitally within a centralized banking system, while cryptocurrencies are entirely digital and rely on blockchain technology.

Chapter Checkup:

A. Fill in the blanks:

1. The specific unit of data that is part of a blockchain and holds verified information is called a **block.**
2. The information stored in a **blockchain** is divided into blocks.
3. Blockchain ensures **privacy** so that the individual and personal details of participants are secured.
4. Decentralised means that the control or decision-making is spread out many different **individuals**.
5. Cryptocurrency is based on blockchain technology. It is not controlled by any **bank** or any government.

B. Tick the (✓) the Correct option:

1. Which of the following statements about blockchain is incorrect?

✓**a. Anyone can easily change information in a blockchain.**
b. Blockchain uses blocks to store information.
c. The information stored in a blockchain is secure.
d. Blockchain utilizes decentralization and security features to store information.

2. Which feature of blockchain aloows everyone in the network to see the entire history of the data?

a. Security ✓**b. Transparency** c. Privacy d. Immutability

3. In a blockchain, each new block needs to be verified by:

a. The buyer c. every individual on the blockchain
c. the seller ✓**d. a portion of blocks**

4. What challenge can arise due to decentralized nature of blockchains and their potential differences in design?

a. Enhanced communication between blockchains.
b. Simplified data sharing among different blockchains.
c. Improved interoperability between various blockchain networks.
✓**d. Difficulty in communication between different blockchains.**

C. Who am I?

1. I am a digital technology that connects pieces of information in a secure way. **Blockchain**
2. I am a type of currency that exists only in digital form and works on blockchain technology. **Cryptocurrency**
3. While withdrawing regular currency notes, I maintain a record of the transaction. **Bank**
4. I am a national currency used to buy things in India. **INR (Indian Rupee)**
5. I am a unit of data in blockchain that holds specific verified information. **Blocks**

D. Write T for True and F for False:

1. Decentralised means there is one central authority controlling everything. **False**

2. Blockchain can be used to create transparent voting systems where every vote is recorded and cannot be altered. **True**

3. If your school uses a blockchain-based digital identity system for students, you cannot view other student's personal information. **False**

4. Cryptocurrencies have a banking system that records transactions, similar to tradition currencies. **False**

5. In a blockchain network, any user can easily access, change or delete the information stored in a book. **False**

E. Answer the following questions:

1. What are blockchains? Give an example that can work on a blockchain.

Ans: Blockchain is a shared, unchangeable record that helps track transactions and assets in a business network. Traditional financial systems, like banks and stock exchanges, use blockchain services to manage online payments, accounts and market trading.

2. What is a cryptocurrency? Write the name of a famous cryptocurrency.

Ans: Cryptocurrency is a type of digital or virtual currency that serves as a medium of exchange.

3. How does blockchain ensure the security and immutability of information?

Ans: A block is a specific unit of data that is part of a blockchain that holds specific verified information. The whole process is designed to be immutable, which means that while the information in it can be seen by all the users, no one will be able to change or delete the information.

4. How does the transparency of a blockchain system build trust among users?

Ans: Transparency means that everyone who is a part of a blockchain can see all the information, and nothing is kept hidden from them. This helps to build trust among the users.

5. Briefly state the challenges of blockchains.

Ans: Like all other technologies, blockchain has some challenges too.

a. Long validation process

b. Slow speed in working with large amount of information.

c. Interoperability

d. Legal challenges

L- 4 LET US DEVELOP APPS!

Do it yourself 4A:

1. **Matching:** 3, 4, 1, 2
2. **Fill in the blanks:**
   a. **Facebook** and **Instagram** are social media apps.
   b. Apps can be **downloaded** and installed on electronic devices.
   c. **Web app** run on web servers and are accessed through web browsers over the internet.
   d. You can download a mobile app from **app stores** available on your phone.

Do it yourself 4B:

1. Name four native apps and four hybrid apps. Which one between two categories do you use the most?

Ans: Native apps: Camera, Clock, Maps, and Settings

Hybrid apps: Uber, Zomato, Instagram, Telegram

We mostly use Hybrid apps

2. Who am I?

a. These apps can help users develop a wide range of skills, including reading, writing, maths, and problem-solving. **Educational apps**.

b. These apps are like virtual platforms where you can meet and talk to your friends. **Social networking apps**

c. These apps provide you with help when you do important financial transactions. **Banking apps**

d. These apps let you shop for all sorts of things without having to go to physical store. **E-commerce apps**

e. These apps are the portals for fun and enjoyment on your phone or tablet. **Entertainment apps**

Chapter Checkup:

A. Fill in the blanks:

1. An **app** is a computer program that you can download and use on your smartphone or tablet.
2. **E-commerce** are special apps that let you shop for all sorts of things without having to go to a physical store.
3. **Hybrid** apps are developed using web technologies like HTML, CSS, and JavaScript and can run on multiple platforms.
4. In MIT App Inventor, various components are present under different categories in **palette.**
5. **Social networking** apps are apps that help people connect and share with others online.

B. Who Am I?

1. I am like a virtual bank branch on your phone or tablet. **Banking app**
2. I can assist you to design and make the app of your dreams. **MIT App Inventor**
3. I am a computer program that you can download and use on your smartphone. **An app**
4. I can show the properties of the selected components. **Properties section**
5. I am a type of app that can work on different types of phones, like both iPhone and Android phones. **Hybrid**

C. Write T for true and F for false:

1. Apps are software programs that can be installed on your desktop. **True**
2. There are two types of apps: hybrid and native. **True**
3. Web apps don't operate on web servers and are not accessed by users through web browsers. **False**
4. Native apps provide the best performance as they are optimized for the particular device. **True**
5. The components section shows the various components that are placed in the Viewer. **True**

D. Answer the following:

1. **What are banking apps?**

Ans: Banking apps are like a virtual bank branch on your phone or tablet. They are the special apps provided by your bank to help you do immediate money transactions without going to the bank in person.

2. **What are Hybrid apps? How are they useful?**

Ans: Hybrid apps can work on different types of phones and use web technologies, allowing them to work on multiple platforms and access device features. They are compatible with both iPhones and Android phones and can be downloaded and installed from their respective app stores, such as the Google Play Store for Android phones and App Store for iPhones.

3. **How are desktop apps different from web apps?**

Web Apps	Desktop Apps
A web app is a software application that operates on web servers and is accessed by users through web browsers over the internet.	Desktop apps are like the computer version of the apps you use on your phone, but they are designed to work on your computer and do all sorts of different things, from writing documents to playing games or editing pictures.
Since web apps are hosted on web servers, users can access them from anywhere, using various devices, without the need for installation.	Desktop apps can be used on a computer or a laptop where they are installed and run locally.
Padlet, YouTube, Gmail, and Google Drive are few examples of web apps.	Skype, Microsoft Power Point, Paint, Microsoft Excel, and iTunes are a few examples of desktop apps.

4. **What are Native apps? Give examples.**

Ans: Native apps are specifically designed for a particular type of phone, such as iPhones or Android phones. They are known for their high speed and excellent performance because they are designed exclusively for your phone. Examples of native apps include Camera, Gallery, Clock, Maps, and Settings.

5. **What is MIT App Inventor?**

Ans: MIT App Inventor is a visual development platform that allows users to create mobile applications for Android devices without the need to write traditional codes. It provides a visual, drag-and-drop interface for designing the user interface and functionality. Users can assemble components and connect blocks to create the app's logic.

L-5 NEW AND EMERGING TECHNOLOGIES

Do it yourself 5A:

Answer the following questions:

1. **Write any two uses of Augmented Reality.**

Ans: Gaming: You can see and interact with virtual objects in your real surroundings.

Navigation: You can find an easy way in a new city, discover nearby places of interest, or get real-time information while driving.

2. **Mention any two disadvantages of Augmented Reality.**

Ans: Advantages of Augmented Reality are:

a. High cost and not everyone afford them.
b. It can be tiring and not good for your eyes.

Do it yourself 5B:

1. **Fill in the blanks:**
   - **a.** Students can take virtual field trips to **historical sites** explore the human body in 3D, or even travel to space to learn about **planets** and **stars**.
   - **b.** You can use VR to take virtual tours of famous **landmarks, museums,** and **cities** around the world.
2. **Choose the picture that is showing VR and explain why.**
   - **a.** VR is a technology that creates a fully immersive computer- generated environment that users can interact with.

Do it yourself 5C:

Answer the following questions:

1. **Write any two uses of Metaverse.**

Ans: Two uses of Metaverse are:

a. Education b. E-commerce

2. **What robot is this and how does it make our daily life easy?**

Ans: Drone: It is used for different tasks such as aerial photography, surveillance and even package delivery.

Do it yourself 5D:

Arrange the steps in the correct order to explain how a 3D printer works:

1. The 3D printer reads the sliced file and begins printing the object layer by layer.
2. A digital 3D model is created using CAD software.
3. Each layer is printed on top of the previous one, and the material solidifies to form a solid object.
4. The 3D model file is converted into a .STL format and sliced into thin horizontal layers by slicing software.

Ans: 2, 4, 1, 3

Do it yourself 5E:

Fill in the blanks:

1. Computer scientists create **software** and **algorithms** to process and analyze biological data.
2. Robots can perform repetitive tasks like **mixing chemicals, running experiments** and even handling **samples**, making research more efficient and accurate.
3. High-performance computing is used to process the enormous amount of **data** generated during **DNA** sequencing.

Do it yourself 5F:

1. **Matching:**

Signal Acquisition	The system responds to commands, often providing feedback to the user	**4**
Signal processing	Processed signals are converted into commands that control devices	**3**
Translation of commands	Sensors pick up electrical activity from the brain	**1**
Feedback and control	Raw signals are filtered and processed to extract meaningful data	**2**

2. **Generative AI has diverse application across many fields. Which of the following is an example of generative AI in action?**

   ✓**a. Creating unique and dynamic game environment**

   b. Storing large amount of data in cloud servers

   c. Managing email communications

   d. Browsing the internet faster

Chapter Checkup:

A. Fill in the blanks:

1. BCIs enable individuals to **control** and **interact** with computers directly using their brain activity.
2. Biotechnology labs often use **automated** equipment controlled by computers.
3. A 3D printer is a magical machine that can create real **tangible** objects from a computer design.
4. **Augmented Reality** makes your world more fun and interactive with the help of gadgets and clever computer tricks.
5. When you put on a VR **headset**, it covers your eyes, and you can't see the real world anymore.

B. Who am I?

1. I am a form of AI that can create new content such as text, images, music or even videos. **Generative AI**
2. I let your thoughts talk to the computer and give commands. **Brain-computer Interfaces**
3. I show you a mix of the real world and computer. **Virtual Reality**
4. I can make a tangible product from a design. **3D printer**
5. I am used to make training and virtual tours more fun and real. **Augmented Reality**

C. Write T for true and F for false:

1. The first step in 3D printing is to load this design into the 3D printer. **False**
2. BCIs do not need inputs like a keyboard and mouse. **True**
3. Robots are used in space exploration. **False**
4. Biotechnology is a science of non-living things. **False**
5. VR technology uses special headsets to see the virtual world. **True**

D. Answer the following:

1. **What are the uses of Augmented Reality?**

Ans: Here are some practical uses of AR:

Gaming: With AR games, you can see and interact with virtual objects in your real surroundings.

Shopping: You can try on clothes, makeup, or spectacles, etc., virtually without going to a store.

Navigation: Using AR, you can find easy way in a new city, discover nearby places of interest, or get real-time information while driving.

Science and Experiments: AR helps you understand complex ideas by showing them visually.

2. **Where do we see robots in our lives every day?**

Ans: Robots in daily life:

Vacuum Cleaners: These are autonomous vacuum-cleaning robots that navigate your home and clean the floors without human intervention.

Medical Devices: In some health care settings, robots assist in surgeries, deliver medications, or help with rehabilitation exercises.

Drones: Unmanned aerial vehicles (UAVs) or drones are used for tasks such as aerial photography, surveillance, and even package delivery.

Traffic Lights and Road Signs: Some traffic management systems use sensors and automation to optimise traffic flow and improve safety.

Automated Coffee Machines: Coffee shops and vending machines often use robotic systems to grind beans, brew coffee, and serve drinks.

3. **What are Brain-Computer Interfaces?**

Ans: Brain-computer Interfaces, or BCIs, are like magic hats for our brains. They let our thoughts and brain stalk to computers and machines. It's as if you could move things or play games on a computer just by thinking about it! BCIs can help people who can't use their bodies very well, and they' real so really cool for science and games. The primary purpose of BCIs is to enable individuals to control and interact with computers, robotic systems, or other devices directly using their brain activity without the need for traditional input methods like a keyboard or mouse.

4. **Explain the concept of Metaverse.**

Ans: The Metaverse is a virtual space where people interact in real time using augmented and virtual reality technologies. It combines aspects of social media, online gaming, and virtual worlds, allowing users to work, play, shop, and socialize in an immersive, 3D digital environment.

5. **What is Biotechnology?**

Ans: Biotechnology is a stream of science that uses living things, like cells and bacteria, to make useful things. It is like using tiny living factories to create medicines, food, and other amazing things that can help people and the environment.