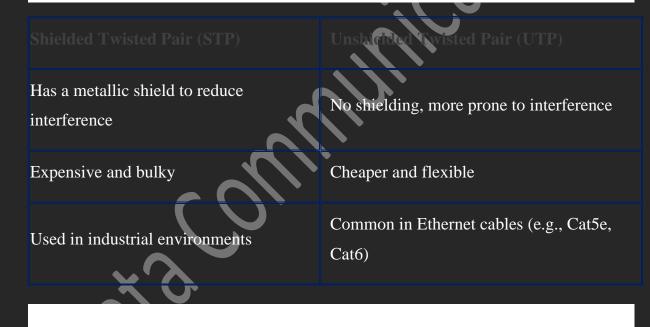
Assignment 2

Data Communications

Q1: Different types of networks

- 1. PAN (Personal Area Network): Short-range (e.g., Bluetooth).
- 2. LAN (Local Area Network): Small geographic area (e.g., office network).
- 3. MAN (Metropolitan Area Network): Covers a city (e.g., city-wide Wi-Fi).
- 4. WAN (Wide Area Network): Large geographic area (e.g., the internet).
- 5. WLAN (Wireless LAN): LAN using wireless tech (e.g., Wi-Fi).

Q2: STP vs. UTP



Q3: Baseband vs. Broadband Transmission

Single signal at a time	Multiple signals simultaneously
Uses entire bandwidth	Divides bandwidth into channels
Short-distance (e.g., Ethernet)	Long-distance (e.g., cable TV, DSL)

Q4: Hub vs. Modem vs. Router vs. Switch

	Function
Hub	Broadcasts data to all connected devices (dumb device).
Modem	Modulates/demodulates signals for internet access (e.g., DSL modem).
Router	Routes data between networks (e.g., connects LAN to WAN).
Switch	Sends data only to the intended device (smarter than a hub).

Q5: MAC Address Transfer

No, the **MAC address** is hardcoded into the **NIC (Network Interface Card)** and remains tied to the physical hardware. Moving the NIC transfers the MAC address to the new PC.

Q6: Common Hardware Network Problems

- Faulty cables (e.g., cuts, bends).
- NIC failures.
- Router/modem power issues.
- IP address conflicts.
- Wireless interference (e.g., walls, other devices).

Q7: Anti-virus Installation

Install anti-virus on **both servers and all workstations**. Servers protect shared resources, while workstations prevent entry points for malware.

Q8: Static IP vs. Dynamic IP | IPv4 vs. IPv6

Static IP	Dynamic IP		
Manually assigned, doesn't	Automatically assigned (e.g., via DHCP),		
change	changes periodically		
Used for servers, printers	Common for home devices		
32-bit address (e.g., 192.168.1.1)	128-bit address (e.g.,		
52-oft address (c.g., 192.108.1.1)	2001:0db8:85a3::8a2e:0370:7334)		
Limited addresses (~4.3 billion)	Virtually unlimited addresses		

Q9: TCP/IP Model Layers

- 1. Application Layer: HTTP, FTP, SMTP (user-facing apps).
- 2. Transport Layer: TCP (reliable), UDP (fast).
- 3. Internet Layer: IP (routing packets).
- 4. Network Access Layer: Physical connections (e.g., Ethernet).

Q10: Web Browser Examples

A **web browser** retrieves and displays web pages (e.g., Chrome, Firefox, Edge, Safari).

Q11: Search Engine Examples

A **search engine** indexes and finds web content (e.g., Google, Bing, DuckDuckGo).

Q12: Internet vs. WWW | Uses

- Internet: Global network of interconnected computers.
- WWW (World Wide Web): Information system accessed via the internet (uses HTTP).
- Daily Uses: Communication (email, social media), education, banking, entertainment.

Q13: ISP Examples in India

Internet Service Providers offer internet access (e.g., Airtel, Jio, BSNL, ACT Fibernet).

Q14: MAC vs. IP vs. Port Address

MAC Address	IP Address	Port Address
Physical hardware ID (e.g., 00:1A:2B:3C:4D)	Logical network ID (e.g., 192.168.1.1)	Identifies specific services (e.g., port 80 for HTTP)
Layer 2 (Data Link)	Layer 3 (Network)	Layer 4 (Transport)

Q15: View Browser History

- **Chrome**: Ctrl+H → View/search history.
- **Firefox**: Library → History.
- **Edge:** Hub icon \rightarrow History.

