ASSIGNMENT 02

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11-A1

COMPUTER SCIENCE

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CCA- 102: Data Communications

Q1: Different types of networks

1. **PAN (Personal Area Networks):** 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 teach (e.g., Wi-Fi).

Q2: STP vs. UTP

Shielded Twisted Pair (STP)	**Unshielded Twisted Pair (UTP)**
Has a metallic shield to reduce interference	No shielding, more prone to interference
Expensive and bulky	Cheaper and flexible
Used in industrial environments	Common in Ethernet cables (e.g., Cat5e, Cat6)

Q3: Baseband vs. Broadband Transmission

Baseband	**Broadband**
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

Device	Function
Hub	Broadcasts data to all connected devices (dumb device).
Modern	Modulates/demodulates signals for internet access (e.g., DSL modern).
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 MAS address to the new PC.

Q6: Common Hardware Network Problems

- Faulty cables (e.g., cuts, bends).
- NIC failures.
- Router/modern 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. IPvs6

Static IP	**Dynamic IP**
Manually assigned, doesn't change	Automatically assigned (e.g., via DHCP), changes periodically
Used for servers, printers	Common for home devices
IPv4	**IPv6**
32-bit address (e.g., 192.168.1.1)	128-bit address (e.g., 2001:0db8:85a3::8a2e:0370:7334)
Limited address (~4.3 billion)	Virtually unlimited addresses

Q9: TCP/IP Modern Layers

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

Q10: Web Browser Examples

A **web browser** retrieves and displays 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 (Word Wide Web)**: Information system accessed via the internet (uses HTTP).
- **Daily Uses**: Communication (email, social media), educations, banking, entertainment.

Q31: 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 Brower History

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