Mobile Computing - Unit I & II Detailed Notes

Unit I: Introduction to Mobile Computing

1. Introduction to Mobile Computing:

- Enables wireless, remote access to data and apps.

- Characteristics: Mobility, wireless communication, portability.

- Applications: Remote work, mobile banking, telemedicine.

2. Issues in Mobile Computing:

- Security, bandwidth constraints, battery life, data synchronization.

3. Cellular Concept:

- Area divided into cells with frequency reuse.

- Components: Cells, base stations, frequency reuse.

4. GSM:

- Uses TDMA, 900/1800 MHz bands.

- Channel types: TCH (voice/data), CCH (control).

5. Location Management (HLR/VLR):

- HLR: Permanent subscriber info.

- VLR: Temporary info while roaming.

6. Handoffs:

- Hard: Break-before-make.

- Soft: Make-before-break.

7. Channel Allocation:

- Fixed (FCA), Dynamic (DCA), Hybrid.

8. CDMA:

- Shared spectrum using unique codes.

- High capacity, secure.

9. GPRS:

- Packet-switched, always-on internet.

- 114 kbps, efficient spectrum use.

Unit II: Wireless Networking

1. Wireless LAN Overview:

- Wireless vs Traditional LAN: cost, flexibility, mobility.

- Weaknesses: Security, QoS, interference.

2. MAC Issues:

- Hidden/Exposed terminal problems.

- Solutions: RTS/CTS, backoff algorithms.

3. IEEE 802.11 Standards:

- 802.11b/g/n/ac: different speeds and frequencies.

- Layers: MAC, Physical.

4. Bluetooth:

- 2.4GHz, short-range, low power.

- Piconet and Scatternet.

5. Wireless Access Protocols:

- FDMA, TDMA, CDMA differences.

6. TCP over Wireless:

- Issues: Packet loss, delay.

- Solutions: Snoop, Split TCP, TCP Vegas.

7. Wireless Applications:

- Email, GPS, m-commerce, healthcare.

8. Data Broadcasting:

- One-to-many transmission.

- Examples: news, streaming.

9. Mobile IP:

- Home Agent, Foreign Agent, CoA.

- Maintains same IP while roaming.

10. WAP:

- Layered architecture (WAE to bearer).

- Low bandwidth use, limited by older tech.