

Unit - I**1. What is mobile computing?**

Mobile computing is a technology that allows transmission of data, via a computer, without having to be connected to a fixed physical link.

2. What is Mobility?

- **A person who moves**
 - Between different geographical locations
 - Between different networks
 - Between different communication devices
 - Between different applications
- **A device that moves**
 - Between different geographical locations
 - Between different networks

2. What are two different kinds of mobility?

User Mobility: It refers to a user who has access to the same or similar telecommunication services at different places.

Device Portability: many mechanisms in the network and inside the device have to make sure that communication is still possible while the device is moving.

3. Find out the characteristics while device can thus exhibit during communication.

- Fixed and Wired
- Mobile and Wired
- Fixed and Wireless
- Mobile and Wireless

4. What are applications of Mobile Computing?

- Vehicles
- Emergencies
- Business
- Replacement of wired networks
- Infotainment
- Location dependent services
- Mobile and wireless devices

5. What are the obstacles in mobile communications?

- Interference
- Regulations and spectrum
- Low Bandwidth
- High delays, large delay variation
- Lower security, simpler to attack
- ☐ Shared Medium Adhoc-networks

6. Give the information's in SIM?

- Card type, serial no, list of subscribed services
- Personal Identity Number(PIN)
- Pin Unlocking Key(PUK)
- An Authentication Key(KI)

7. What are the Advantages of wireless LAN?

- Flexibility
- Planning

Design

- Robustness

8. Mention some of the disadvantages of WLANS?

- Quality of service
- Proprietary solutions.
- Restrictions
- Safety and Security

9. Describe about MAC layer in DECT architecture.

The medium access control (MAC) layer establishes, maintains and releases channels for higher layers by activating and deactivating physical channels. MAC multiplexes several logical channels onto physical channels. Logical channels exist for signaling network control, user data transmission, paging or sending broadcast messages. Additional services offered include segmentation/reassembly of packets and error control/error correction.

10. What are the basic tasks of the MAC layer?

Medium access Fragmentation of user data Encryption

11. What are the basic services provided by the MAC layer? Asynchronous data service (mandatory)

Time-bounded service (optional)

12. What are the techniques used for MAC management?

Synchronization

Power management

Roaming

Management information base(MIB)

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14. Define hidden terminal.

The transmission range of A reaches B but not C. The transmission range of C reaches B but not A. B reaches A and C. A cannot detect C and vice versa.

A starts sending to B, but C does not receive this transmission. C also wants to send something to B and senses the medium. The medium appears to be free, the carrier sense fails. C also starts sending, causing a collision at B. But A can't detect this collision at B and continues with its transmission. A is hidden for C and vice versa.

15. What is Mobile Computing and the applications ?

Mobile computing is the process of computation on a mobile device. In such computing, a set of distributed computing systems or service provider servers participate, connect, and synchronise through mobile communication protocols.

APPLICATIONS:

- i) Mobile computing offers mobility with computer power.
- ii) It provides decentralized computations on diversified devices, systems, and networks, which are mobile, synchronized, and interconnected via mobile communication standards and protocols.
- 13) Mobile computing facilitates a large number of applications on a single device.

16. Limitations of Mobile Computing?

- i) Resource constraints.
- ii) Interface
- iii) Bandwidth
- iv) Dynamic changes in communication environment.
- v) Network issues.
- vi) Interoperability issues.
- vii) Security Constraints.

17. Give the difference between the network 1G, 2G, 2.5G, 3G mobile communication?

1G - Voice-only communication.

2G – Communicate voice as well as data signals.

2.5G – Enhancements of the second generation and support data rates up to 100 kbps.

3G – Mobile devices communicate at even higher data rates and support voice, data, and multimedia streams. High data rates in 3G devices enable transfer of video clips and faster multimedia communication.

19. What is MAC?

Message authentication codes (MAC) are also used to authenticate messages during transmission. MAC of a message is created using a cryptographic MAC function which is similar to the hash function but has different security requirements.

20. Define Mobile Binding?

A binding created for providing mobility to a mobile node after registration at a foreign network.

21. Agent-based Computing

An agent is any program that acts on behalf of a (human) user. A software mobile agent is a process capable of migrating from one computer node to another.

22. Ubiquitous computing

Ubiquitous computing enhances computer use by making many computers available throughout the physical environment, while making them effectively invisible to users.

23. Client-Server Computing

An architecture in which the client is the requesting machine and the server is the supplying machine. The client contains the user interface and may perform some or all of the application processing.

24. What do you mean by Digital Signature?

Digital signatures are used to enable verification of the records. A DSA (Digital Structure Algorithm) is used to sign a record before transmitting. It provides for a variable key length of maximum 512 or 1024 bits. The DSS (Digital Signature Standard) is based on the DSA. Signatures enable identification of the sender identify the origin of the message, and check message integrity.

25. Define the term wireless?

Wireless telecommunications refers to the transfer of information between two or more points that are not physically connected. Distances can be short, such as a few metres for television remote control, or as far as thousands or even millions of kilometers for deep-space radio communications. It encompasses various types of fixed, mobile, and portable applications, including two-way radios, cellular telephones, personal digital assistants (PDAs), and wireless networking.

26 What are the different types of mobile Middleware?

1. Adaptation

2. Agent

27. What are the logical channels in GSM?

Traffic channel (TCH)

Control channel (CCH)

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29. Define GPRS?

General Packet Radio Service (GPRS) is a packet oriented service for mobile devices data communication which utilizes the unused channels in TDMA mode in a GSM network and also sends and receives packet of data through the internet.

30. What is Communication?

Communication is a two-way transmission and reception and reception of data streams. Transmissions are of two types,

Guided Transmission

Unguided Transmission

31. Explain difference between wired and wireless networks**Wired Vs. Wireless Networks**

Wired Networks	Mobile Networks
- high bandwidth	- low bandwidth
- low bandwidth variability	- high bandwidth variability

- can listen on wire	- hidden terminal problem
- high power machines	- low power machines
- high resource machines	- low resource machines
- need physical access(security)	- need proximity
- low delay	- higher delay

32. Types of Wireless

Devices Laptops

Palmtops

PDA's

Cell

phones

Pagers

Sensors

33. Why Mobile Computing?

Enable anywhere/anytime connectivity

Bring computer communications to areas without pre existing infrastructure

Enable mobility

Enable new applications

An exciting new research area

34.what are the New Forms of Computing available?.

Wireless Computing

Nomadic Computing

Mobile Computing

Ubiquitous Computing

Pervasive Computing

Invisible Computing

35.Mobile Communication Networks: Examples

GSM (Global System for Mobile Communications): worldwide standard for digital, cellular Mobile Radio Networks

UMTS (Universal Mobile Telecommunications System): European Standard for future digital Mobile Radio Networks

AMPS (Advanced Mobile Phone System): analog Mobile Radio Networks in USA

DECT (Digital Enhanced Cordless Telecommunications): European standard for cordless phones

TETRA (Terrestrial Trunked Radio): European standard for circuit switched radio networks

ERMES (European Radio Message System): European standard for radio paging systems (Pager)

802.11: International standard for Wireless Local Networks

Bluetooth: wireless networking in close/local

area Inmarsat: geostationary satellite systems

Teledesic: planned satellite system on a non-geostationary orbit

36.Components of a wireless communication system

Transmitter, receiver, filter, antenna, amplifier, mixers

37.Wireless Networking Standards (Table1.1)

ITU, IEEE and ISO

IEEE 802.11 standards (a,bc,d,e,f...u)

39. What are the disadvantages of small cells?

- a) Infrastructure b) Handover c) Frequency

40. What are the benefits of reservation schemes?

- a) Increased no other station is allowed to transit during this slot b) Avoidance of congestion.
c) Waiting time is clearly known.

3. Differentiate between free space loss and path loss. Free space loss Path loss

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42. Mobile Computing - Characteristics

–Mobile devices

•Laptops

•Palmtops

•Smart cell phones

–Requirements

•Data access:

–Anywhere

–Anytime

•Nomadic users

–Constraints

•Limited resources

•Variable connectivity:

–Performance

–Reliability

43. What are the different types of modulation ?

The Modulation types are:

i). Amplitude Modulation. ii). Frequency

Modulation. iii). Phase Modulation.

44. What are the multiplexing techniques ?

The Multiplexing techniques are: i) Space division multiplexing. ii) Time division multiplexing. iii) Frequency division multiplexing. iv) Code division multiplexing.

45. Define Space Division Multiplexing Access?

Space division multiple access (SDMA) means division of the available space so that multiple sources can access the medium at the same time. SDMA is the technique in which a wireless transmitter transmits the modulated signals and accesses a space slot and another

transmitter accesses another space slot such that signals from both can propagate in two separate spaces in the medium without affecting each other.

46. Define Code division multiplexing Access?

CDMA(Code Division Multiple Access) is an access method in which multiple users are allotted different codes (sequence of symbols) to access the same channel (set of frequencies)

47. Define Time division multiplexing Access?

Time division multiplexing (TDMA) is an access method in which multiple users, data services, or sources are allotted different time-slices to access the same channel. The available time-slice is divided among multiple modulated-signal sources. These sources use the same medium, the same set of frequencies, and the same channel for transmission of data.

48. Define Frequency division multiplexing Access?

Frequency division multiple access (FDMA) is an access method in which entails assignments of different frequency-slices to different users for accessing the same carrier.

49. Difference between Circuit Switching and Packet Switching?

CIRCUIT SWITCHING :

Circuit switching is a method of data transmission in which a circuit (Communication channel or path) once established, continues to be used till the transmission is complete.

PACKET SWITCHING :

Packet switching is a means of establishing connection and transmitting data in which the message consists of packets containing the data frames. A packet is a formatted series of data, which follows a distinct path directed by a router from among a number of paths, available at that instant.

50. What is CSMA

The capacity of ALOHA or slotted ALOHA is limited by the large vulnerability period of a packet.

- By listening before transmitting, stations try to reduce the vulnerability period to one propagation delay.

- This is the basis of CSMA (Kleinrock and Tobagi, UCLA, 1975).

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Station that wants to transmit first listens to check if another transmission is in progress (carrier sense).

- If medium is in use, station waits; else, it transmits.

- Collisions can still occur.

- Transmitter waits for ACK; if no ACKs, retransmits.

51. What is the aim of ubiquitous computing? (AUT-NOV/DEC 2012)

- The aim of ubiquitous computing is to design computing infrastructures in such a manner that they integrate seamlessly with the environment and become almost invisible.

- Present Everywhere Bringing mobile, wireless and sensor Ubiquitous computing (ubicomputing) integrates computation into the environment, rather than having computers which are distinct objects

52. What are the characteristics of mobile computing devices?

- Adaptation Data dissemination and Management
- Heterogeneity Interoperability Context awareness

53. What are the key constraints of mobile computing?

- unpredictable variation in network quality
- lowered trust and robustness of mobile elements

Part -B

1. Explain the structure of mobile computing.
2. Explain the MAC protocols in detail.
3. Define mobile computing. Explain its characteristics and applications.
4. Explain fixed assignment schemes and random assignment schemes.
5. Write short notes on, i) mobile computing environment and ii) MAC protocols.