Department of computer science

16UCS6E9- MOBILE COMPUTING

K1 Questions

Unit I

1.The modulation technique used for mobile communication systems during world war II was

a. Amplitude modulation
b. Frequency modulation
c. ASK
d. FSK

2. ———— introduced Frequency Modulation for mobile communication systems in 1935.
a. Edwin Armstrong
b. Albert Einstein
c. Galileo Galilei
d. David Bohm

3. The early FM push-to-talk telephone systems were used in
a. Simplex mode
b. Half duplex mode
c. Full duplex mode
d. None of the above

4. DECT stands for
a. Digital European Cellular Telex
b. Digitized Emergency Cellular Telephone
c. Digital European Cordless Telephone
d. Digital European Cellular Telephone

5.World's first cellular system was developed by
a. Nippon Telephone and Telegraph (NTT)
b. Bellcore and Motorola
c. AT&T Bell Laboratories
d. Qualcomm

6. Paging systems were based on
a. Simplex systems
b. Half duplex systems
c. Full duplex systems
d. None of the above

7.Garage door opener is a

a. Transmitter
b. Receiver
c. Transceiver
d. None of the above

8.Carrier frequency of a TV remote control is in the range
a. of Infra red
b. < 100 MHz
c. < 1 GHz
d. < 2 GHz

9.Half duplex system for communication has
a. Communication in single direction
b. Communication in single direction at a time
c. Communication in both directions at the same time
d. None of the above

10.MIN stands for
a. Mobile Identification Number
b. Mobile Internet
c. Mobility In Network
d. None of the above

Unit II

1.Which of the following is not a standard used for paging system?
a) POCSAG
b) ERMES
c) IS-95
d) FLE

2.Paging system uses which mode of transmission?
a) Full duplex
b) Simplex
c) Half Duplex
d) DuplexX

3.The information sent by paging system is known as a:
a) Note
b) Line
c) Message
d) Page

4.Which type of message cannot be sent with the help of paging system?
a) Alphanumeric message
b) Video message
c) Voice message
d) Numeric message

5.What is a paging access number?
a) An e mail id
b) A username
c) A toll free telephone number
d) A registration number

6.Which of the following is not the property of paging system?
a) Asymmetric communication
b) Light weight
c) High cost
d) Wide area coverage

7.What is a pager in the paging system?
a) A transmitter
b) A receiver
c) A transceiver
d) An equalizer

8.Who introduced the paging system for the first time?
a) Al Gross
b) Teri Pall
c) Alexander Graham Bell
d) Martin Cooper

9.Which of the following is the drawback for cordless telephones?
a) Wireless technology
b) Limited coverage area
c) Mobile
d) Security

10.Which of the following is a fully digital cordless system?
a) CT0
b) CT1
c) CT1+
d) DECT

K1 Type

Unit III

1. Which of the following is the world's first cellular system to specify digital modulation and network level architecture?

a) GSM b) AMPS c) CDMA d) IS-54

2. Previously in 1980s, GSM stands for _____

a) Global system for mobile **b) Groupe special mobile** c) Global special mobile d) Groupe system mobile

3. Which of the following comes under supplementary ISDN services?

a) Emergency calling **b) Call diversion** c) Packet switched protocols d) Standard mobile telephony

4. Who set the standards of GSM?

a) ITU b) AT & T **c) ETSI** d) USDC

5. ISDN integrates speech and data on

a) Different lines **b) Same lines** c) Different & Same lines d) None of the mentioned

6. Which of the following comes under supplementary ISDN services?

a) Emergency calling b) Packet switched protocols c) Standard mobile telephony **d) Call diversion**

7.Which of the following memory device stores information such as subscriber's identification number in GSM?

a) Register **b) SIM** c) Flip flop d) SMS

8. Paging systems were based on

a) Simplex systems b) Half duplex systems c) Full duplex systems
d) None of the above

9.A computer network permits sharing of

a) Resources b) Information c) **Both a & b** **d)** None of these

10. ATM stands for

a) Automatic taller machine b) **Automated teller machine** **c)** Automatic transfer machine
d)Automated transfer machine

Unit-IV K1 Type

1. What is the name of the web browsing format language supported by 2.5G technology?

a) Wireless Application Protocol b) b) Hypertext Markup Language c) Extensible Markup Language d) Hypertext Transfer Protocol

2. Which of the following is a 2.5G CDMA standard?

a) IS-95 b) Cdma2000 **c) IS-95B** d) CdmaOne

3. Global Service for Mobile (GSM) uses two bands for duplex

a) Data **b) Communications** c)Signals d) Stations

4. Which of the following is not used to improve received signal quality over small scale times and distance?

a) Modulation b) Equalization c) Diversity d) Channel coding

5. Time for convergence of an equalizer is not a function of _____

a) Equalizer algorithm b) Equalizer structure c) Time rate of change of multipath radio channel **d) Transmitter characteristics**

6. What is the access point (AP) in wireless LAN?

a) device that allows wireless devices to connect to a wired network b) wireless devices itself

c) both device that allows wireless devices to connect to a wired network and wireless devices itself
d) none of the mentioned

7. In wireless ad-hoc network

a) access point is not required b) access point is must c) nodes are not required
d) none of the mentioned

8. A wireless network interface controller can work in

a) infrastructure mode b) ad-hoc mode **c) both infrastructure mode and ad-hoc mode** d) none of the mentioned

9.In wireless network an extended service set is a set of

a) connected basic service sets b) all stations c) all access points d) none of the mentioned

10.Mostly _____ is used in wireless LAN.

a) time division multiplexing **b) orthogonal frequency division multiplexing** c) space division multiplexing d) none of the mentioned

Unit-V K1 type

1. Why spread spectrum technique is inefficient for a single user?
   a) **Large Transmission Bandwidth**
   b) b) Small transmission bandwidth
   c) Fixed transmission bandwidth
   d) Fixed null bandwidth
2. Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?
   a)CDMA

   b)CSMA/CA

   c)ALOHA
   d) None of the mentioned

3.Which of the following leads to the 3G evolution of GSM, IS-136 and PDC systems?

a) W-CDMA b) GPRS c) EDGE. d) HSCSD

4. Which one of the following event is not possible in wireless LAN.
a) collision detection b) acknowledgement of data frames
c) multi-mode data transmission d) none of the mentioned

5. What is WPA?
a) wi-fi protected access
b) wired protected access
c) wired process access
d) wi-fi process access

6. For a I-Mbps data rate, 16 Bit sequence in which only first bit is set to 1 and rest are

a) 0 b)1 c) -1 d) 2

7. _____ is the anticipation of unauthorized access or break to computers or data by means of wireless networks.
a) Wireless access b) Wireless security **c) Wired Security** d) Wired device apps

8. When a wireless user authenticates to any AP, both of them go in the course of four-step authentication progression which is called _____
a) AP-handshaking b) 4-way handshake **c) 4-way connection** d) wireless hands

9. Which type of handoff used in CDMA?
a) Soft handoff b) Hard handoff **c) Soft & hard handoff** d) None of the above

10. _____ is used to improve reception by collecting time delayed versions of the required signal.
a) RAKE receiver b) Equalizer c) Frequency modulator d) High pass filter

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K2 Questions

Unit I

1. Describe the types of wireless applications.

--Sensor
--Embedded controllers
--Pager
--Mobile phones
--Personal digital assistant
--Laptop

2. List the limitation of mobile computing?

-Range and Bandwidth

-Security standards

-Power consumption

-Transmission interferences

3. Describe cell in detail.

The geographic area or cellular service area is divided into small hexagonal region called cells. It is the basic unit of a cellular system. These cells collectively provide coverage over larger geographical areas. That is why a user can communicate through mobile phones even if the equipment is moving through cells during transmission.

4. Describe Handoff in cellular networks.

Handoff is the process by which a mobile telephone call is transferred from one base station to another base station. There are two types of handoff.

- Hard Handoff
- Soft Handoff

5. What is mobile agent?

A mobile agent is a software that can move across the network and represent various tasks. It is a distributed computing paradigm. So you can think agent is an independent software program that runs on behalf of a network user.

6. What are the different services provided by GSM.

GSM provides the following types of services.

- Bearer services:
- Tele Service:

7. Describe Localization and calling in GSM

Worldwide localization of users and roaming are the main service provided by the GSM network system. The system always knows where a user currently is, and the same phone number is valid worldwide. For providing this service GSM updates the user location periodically. The HLR always contains information about the current location.

8. Describe Mobile IP.

Mobile IP is an open standard that allows users to keep the same IP address and stay connected while roaming between IP networks. Mobile IP provides the facility to users to keep the same IP address while traveling to a different network.

9. What is mobile computing?

Mobile computing is a technolgythat allows transmission of data, via a computer,Without having to be connected to a fixed physical link.

10. 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

Unit II

1. What is guard space?

   Guard spaces are needed to avoid frequency band overlapping is also called channel interference.

2. What is multiplexing?

Multiplexing is transmitting multiple signals over a single communications line or computer channel. The two common multiplexing techniques are FDM, which separates signals by modulating the data onto different carrier frequencies, and TDM, which separates signals by interleaving bits one after the other.

3. What is FDM

FDM is frequency division multiplexing which describes schemes to subdivide the frequency dimension into several non overlapping frequency bands.

4. What is hopping sequence?

Transmitter and receiver stay on one of the channels like and TDM.The pattern of channel usage is called the hopping sequence.

5. What is dwell time?

The time spend on a channel with a certain frequency is called the dwell time

6. What are the two types of hopping sequence?

1) Slow hopping 2) Fast hopping

7. What are the advantages of cellular systems?

The advantages of cellular systems are, Higher capacity Less transmission power Local interface only Robustness

8. What are digital cellular networks?

Digital cellular networks are segment of the market for mobile and wireless device which are growing most rapidly.

9. What are the disadvantages of cellular systems?

The advantages of cellular systems are, _ Infrastructure needed _ Handover needed _ Frequency planning

10. What is GSM?

GSM is group special mobile.GSM is the successful digital mobile telecommunication system in the world today.

Unit –III

1. What is GSM?
   Short form of Global System for Mobile Communications, is a wireless network system
   - A standard for digital cellular mobile communications
   - International roaming arrangements are enabled among mobile network operators, by providing the subscribers to use their personal mobile phones anywhere in the world.
2. What is a cell?
   Cell : Cell is the basic service area; one BTS covers one cell. Each cell is given a Cell Global Identity (CGI), a number that uniquely identifies the cell.

3. What is PLMN ?
   The area covered by one network operator is called the Public Land Mobile Network (PLMN). A PLMN can contain one or more MSCs.
4. List the security of GSM
   It provides enhanced security, as confidential subscriber information such as the IMSI or the individual subscriber authentication key (Ki) is never released from the SIM during the authentication process.

5. What does *Short Message Service (SMS)* mean?

   Short Message Service (SMS) is the most basic communications technology for mobile data transfer and is characterized by the exchange of short alphanumeric text messages between digital line and mobile devices. SMS messaging's key influential factor is affordability.
6. Write about value-added service (VAS)?
   A **value-added service** (**VAS**) is a popular telecommunications industry[1] term for non-core services, or, in short, all services beyond standard voice calls and fax transmissions.
7. Explain what is the difference between Web testing and WAP testing?

   WAP Testing: It is the testing the WAP (Wireless Application Protocol) used in network applications

   Web Testing: It is related mainly to the testing of web applications such as websites and portals

8. List out some of the automated mobile testing tools?

For mobile testing, two kinds of automation tools are available to test mobile Applications.

- Object based mobile testing tools: Jama solution, Ranorex,
- Image based mobile testing tools: RoutinBot, Egg Plant, Sikuli

9. Describe the types of wireless applications.

Now a day mobile application is used in every field in real life. Some of them are.
- In Vehicles
- In Hospitals
- In Business
- In Entertainment
- In Location dependent services
- In Mobile and wireless devices

--Sensor
--Embedded controllers
--Pager
--Mobile phones
--Personal digital assistant
--Laptop

10. What are the limitation of mobile computing?

Range and Bandwidth: In general direct cable connection is faster than mobile internet conection. 2G, 3G, 4G networks are fast but these networks are usually available within range of cell phone towers. The main problem with wireless networks is that it works within limited range.

Unit-IV

1. Who owns GPRS ?

The GPRS specifications are written by the European Telecommunications Standard Institute (ETSI), the European counterpart of the American National Standard Institute (ANSI).

2. List Goals of GPRS

GPRS is the first step toward an end-to-end wireless infrastructure and has the following goals:

- Open architecture
- Consistent IP services
- Same infrastructure for different air interfaces
- Integrated telephony and Internet infrastructure

- Leverage industry investment in IP
- Service innovation independent of infrastructure

3.List few GSM Network that needs modification to implement GPRS.

MS, BTS, BSC, GSN, Databases (VLR, HLR)

4. What is mean by throughput?

The throughput specifies the maximum/peak bit rate and the mean bit rate.

Using these QoS classes, QoS profiles can be negotiated between the mobile user and the network for each session, depending on the QoS demand and the available resources.

5. Write about Data Packet Routing.

The important roles of GGSN involve synergy with the external data network. The GGSN updates the location directory using routing information supplied by the SGSNs about the location of an MS.

6. Write about GPRS - Billing Techniques

The SGSN and GGSN register all possible aspects of a GPRS user's behaviour and generate billing information accordingly. This information is gathered in so-called Charging Data Records (CDR) and is delivered to a billing gateway.

7. What is meant by Mobile-originated message ?

This path begins at the GPRS mobile device and ends at the host.

8. Define GPRS Access Point Name

The GPRS standards define a network identity called an Access Point Name (APN). An APN identifies a PDN that is accessible from a GGSN node in a GPRS network.

9.Expand(SGSN) & (GGSN)

Serving GPRS Support Node and Gateway GPRS Support Node

10.What is mean by routing area?

GPRS introduces the concept of a Routing Area. This concept is similar to Location Area in GSM, except that it generally contains fewer cells. Because routing areas are smaller than location areas, less radio resources are used While broadcasting a page message.

Unit-V

1. List types of WLAN technologies.

Infrared• UHF narrow band• Spread Spectrum Techniques.

2.List the parameters that influence the handoff.

The parameters that influence the handoff i) The radio link.(ii) Network management.(iii) Service issue

3.List the WLAN topologies.

Peer –to-peer (ad-hoc) technology• Access point based topology• Point –to- multipoint topology•

4.What is hidden terminal problem?

Hidden terminals are nodes that are hidden (or not reachable) from the sender of a datatransmission session, but are reachable to the receiver of the session. The hidden terminalcan cause collisions at the receiver node.

5.Name some of the outdoor propagation models.

Some of the commonly used outdoor propagation models are:i.Longley-Rice modelii. Durkin's model iii. OkumurOkumura model

6.List the WLAN topologies.

Peer –to-peer (ad-hoc) technology• Access point based topology• Point –to- multipoint top0LOGY

7.Give the applications of WLAN

Public wi-fi access, outdoor surveillance, and outdoor inventory control all stretch the need for outdoor wireless access. Remote networks as well as client devices need to be connected. These networks could be in remote buildings, or mobile networks that are located outside. Here are the top 3 applications for Outdoor Wireless Networks.

8.What is infrared (IR) transmission?

Infrared light transmission is one of the important technologies used in wireless LAN. It is based on the transmission of infrared light at 900 nm wavelength

9.What is the principle behind infrared technology?

Infrared technology uses diffuse light reflected at walls, furniture etc. Or directed light when line of sight (LOS) exists between sender and receiver.

10.What are the advantages of infrared technology?

Shielding is easy and no need for license for infrared technology. Electrical devices do not interfere with infrared transmission.

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K3 Questions

Unit I

1. Explain Mobility of bits and bytes
2. Explain the concept of Wireless the beginning
3. Explain about Dialogue control networks
4. Generalize Middleware and gateways
5. Explain about Application and services
6. Generalize mobile computing applications in detail.
7. Explain about Players in the wireless space
8. Explain about History of computers
9. Briefly explain about History of internet
10. Write in detail about Internet, its consequences.

Unit II

1. Explain about Evolution of telephony
2. Analyze Multiple access procedures in detail
3. Generalize the concept of Mobile computing through telephone
4. Explain about Developing an IVR application
5. Explain about voice XML in detail.
6. Explain about Telephony applications programming interface(TAPI)
7. Explain about Emerging Technologies
8. Explain about Bluetooth Radio Frequency Identifications
9. Explain about Wireless Broadband
10. Apply Mobile IP applications in GSM scenario.

Unit-III

1.Write about GSM architecture in detail
2.Describe Cell in detail

3.Explain Handoff in Cellular network
4.What is mobile agent?
5.Describe Localiztion and calling in GSM
6.Describe Mobile IP
7.What is Hidden Terminal Problem? Explain in brief.
8.Explain in brief about SMS.
9.What are the value added services through in SMS?
10. List the advantages of mobile computing over SMS.

Unit-IV

1. What is GPRS? List few protocols of GPRS Protocol Stack.

2. Explain the different coding schemes used in GPRS and their importance.

3. How are GPRS terminals classified?

4. How does GPRS architecture differ from GSM?

5. Write about GPRS network architecture.

6. Analyze the mobility of the GPRS system.

7. Explain about GPRS operations

8. Write short notes on WAP

9. Write short notes on MMS

10. List and Explain about the applications related to GPRS.

11. Write down the Limitations of GPRS system.

Unit-V

1. Write short notes on Spread Spectrum technology
2. Analyze Is-95 technology
3. Compare CDMA and GSM
4. Write about 3rd Generation networks
5. List and Explain the Applications on 3G
6. List the advantages of Wireless LAN.
7. Compare Wi-Fi Vs 3G
8. Compare and analyze Mobile ADHOC networks and sensor networks
9. Describe about LAN Security.
10. Explain Wireless LAN architecture.

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K4 Questions

Unit I

1.Analyze the Ubiquitous Network in detail.

2. Briefly analyze the architecture of mobile computing

3. Briefly analyze the Three-Tier architecture

4. Briefly analyze the Design considerations for mobile computing

5. Briefly explain about Mobile computing through Internet

Unit II

1. Analyze how to develop an IVR application in detail.
2. Analyze Wi-max concepts in detail.
3. Briefly analyze the concepts of multiple access procedures.
4. Briefly analyze the concepts involved in IPv6.
5. Briefly analyze java card and its uses.

Unit-III

1. Analyze Address and identifiers in GSM network.
2. Analyze mobile computing over SMS.
3. Write a note on Short message service.
4. List and explain Value added services through SMS
5. How to access SMS bearer?

Unit-IV

1. Write short note on GPRS and Packet network.
2. Analyze the GPRS network architecture with neat representation.
3. List and explain the Network Operations.
4. List and explain the data services in GPRS
5. List the Applications of GPRS with detailed explanation.

Unit-V

1. Describe about the spread spectrum technology.
2. Explain about Wireless data and communication.
3. Explain the mobility in Wireless LAN.
4. Analyze Wireless LAN Security.
5. Compare and explain CDMA and GSM Technologies.

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K5 Questions

Unit I

1.Evaluate the security concerns in mobile computing.

2. Briefly appraise the Application and Services in mobile computing.

3. Briefly appraise the network strategies involved in mobile computing

4. Briefly elaborate theStandard bodies in mobile computing

5. Briefly elaborate the middleware and gateway concepts in mobile computing

Unit II

1. Elaborate how to develop an IVR application in detail.
2. ElaborateWi-max concepts in detail.
3. Evaluate the Emerging Technologies and trends in mobile computing
4. Appraise Radio Frequency Identifications in mobile computing
5. Appraise the java card and its uses.

Unit-III

1. Describe GSM architecture in detail.
2. Elloborate call routing in GSM.
3. Explain about PLMN interfaces.
4. Write about GSM entities in detail.
5. Write on Network aspects in GSM.

Unit-IV

1. Analyze the Limitations of GPRS.
2. Write the procedures for Billing and charging in GPRS.
3. Explain the advantages of wireless application protocol.
4. Expalin about MMS and its services.
5. What are applications that are handled by GPRS in real time? Explain.

Unit-V

1. Explain about 3rd generation networks.
2. Explain about Wireless LAN architecture
3. Discuss about the Wireless LAN mobility
4. Compare and Explain Mobile ADHOC networks and Sensor in Wireless LAN.
5. Explain about Wireless LAN Security.