PROBABLE QUESTION & ANSWER

SUBJECT-WC SEMESTER-6TH BRANCH-ETC

1. Which of the following is not a standard used for paging system?
a) POCSAG
b) ERMES
c) IS-95
d) FLEX
View Answer
Answer: c
Explanation: IS-95 is a standard used for cellular system which is based on code division multiple access (CDMA). POCSAG (Post Office Code Standard Advisory Group), ERMES (European Radio Messaging System) and FLEX are the protocols used in paging system.

2. Paging system uses which mode of transmission?
a) Full duplex
b) Simplex
c) Half Duplex
d) Duplex
View Answer
Answer: b
Explanation: Simplex systems communicate in only one way. For the paging systems, messages received are not acknowledged and thus they use simplex mode of transmission.

3. The information sent by paging system is known as a _____
a) Note
b) Line
c) Message
d) Page
View Answer
Answer: d
Explanation: Page is concise information sent by a paging system to the subscribers of entire service area.

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
View Answer
Answer: b
Explanation: The message sent by a paging system can be numeric, alphanumeric or voice depending upon the type of service.

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
View Answer
Answer: c
Explanation: Paging access number is a telephone number which is used to send the information to the subscriber.

6. Which type of transmission technique is employed by paging system?
a) Simulcasting
b) Multicasting
c) Unicasting
d) Hybrid
View Answer
Answer: a
Explanation: Simulcast is a reliable technique used by paging system by transmitting the same paging signal from multiple paging transmitters at approximately equal times.

7. Which of the following is not the property of paging system?
a) Asymmetric communication
b) Light weight
c) High cost
d) Wide area coverage
View Answer
Answer: c
Explanation: One of the main reasons for the increased users of paging system was its less cost. But as the prices of cellular system declined, the users of paging system also decreased.

8. Which of the following properties describes the transmitters and receivers in paging system?
a) High complexity and high power transmitter, high complexity and high power receivers
b) Low complexity and low power transmitter, low complexity and low power receivers
c) Low complexity and low power transmitter, high complexity and high power receivers
d) High complexity and high power transmitter, low complexity and low power receivers
View Answer
Answer: d
Explanation: High power of transmitters helps paging signal to easily penetrate the building and low power receivers allow long usage time and light weight batteries.

9. What is a pager in the paging system?
a) A transmitter
b) A receiver
c) A transceiver
d) An equalizer
View Answer
Answer: b
Explanation: A pager is a wireless device which receives the page, i.e. numeric, alphanumeric or voice message sent by the transmitter.

10. Who introduced the paging system for the first time?
a) Al Gross
b) Teri Pall
c) Alexander Graham Bell
d) Martin Cooper
View Answer
Answer: a
Explanation: AL Gross introduced the first paging system during world war in 1949.

11. Which of the following is a protocol used for cordless telephone system?
a) PACS
b) ERMES
c) IS-95
d) FLEX
View Answer
Answer: a
Explanation: PACS (Personal Access Communication System) is a protocol used for cordless telephone system. ERMES and FLEX are used by paging system. And IS-95 is used for cellular system.

12. In which frequency range do the cordless phones mostly work?
a) 43-50 MHz
b) 88-108 MHz
c) 540-1600 KHz
d) 200-540 KHz
View Answer
Answer: a
Explanation: Cordless phones mostly operate in the frequency range of 43-50 MHz. The frequency range of FM is 88-108 MHz and for AM is 540-1600 KHz.

13. Which of the following is the drawback for cordless telephones?
a) Wireless technology
b) Limited coverage area
c) Mobile
d) Security
View Answer
Answer: b
Explanation: Cordless telephone systems are wireless, but they have a disadvantage of limited coverage area with cell size of approx. 300 m. Being digital, they have very less chance of eaves dropping.

14. Which of the following is a fully digital cordless system?
a) CT0
b) CT1
c) CT1+
d) DECT
View Answer
Answer: d
Explanation: Digital enhanced cordless telecommunication (DECT) is a fully digital system

established in 1991. CT0, Ct1, Ct1+ were analog systems established in 1980, 1984 and 1987 respectively.

15. Which of the following is an example of local wireless system?
a) GSM
b) Cordless telephone system
c) UMTS
d) EDGE
View Answer
Answer: b
Explanation: GSM, UMTS and EDGE covers worldwide area whereas cordless system has vey less coverage area.

16. Which of the following is not a characteristic of cellular telephone system?
a) Accommodate a large number of users
b) Large geographic area
c) Limited frequency spectrum
d) Large frequency spectrum
View Answer
Answer: d
Explanation: Cellular systems accommodate a large number of users within a limited frequency spectrum over a large geographic area.

17. What is the responsibility of MSC in cellular telephone system?
a) Connection of mobile to base stations
b) Connection of mobile to PSTN
c) Connection of base station to PSTN
d) Connection of base station to MSC
View Answer
Answer: b
Explanation: Mobile Switching Center (MSC) is responsible for connecting all mobiles to the PSTN (Public Switched Telephone Network) in a cellular system.

18. Who has the responsibility of billing and system maintenance function in cellular system?
a) Base Station
b) PSTN
c) MSC
d) Mobile system
View Answer
Answer: c
Explanation: Mobile switching center (MSC) accommodates 100,000 subscribers and 5,000 simultaneous conversations at a time and handles all billing and system maintenance functions.

19. What is the function of FVC (Forward Voice Channel)?
a) Voice transmission from base station to mobiles
b) Voice transmission from mobile to base station
c) Initiating mobile calls

d) Broadcast all traffic request for all mobile
View Answer
Answer: a
Explanation: FVC (Forward Voice Channel) and RVC (Reverse Voice Channel) are responsible for voice transmission. FVC is used for voice transmission from base station to mobile and RVC is used for voice transmission from mobile to base station.

20. Which two channels are responsible for initiating mobile calls?
a) FVC and FCC
b) FVC and RVC
c) FCC and RCC
d) FCC and RVC
View Answer
Answer: c
Explanation: FCC (Forward Control Channel) and RCC (Reverse Control Channel) are control channels responsible for initiating mobile calls.

21. Of the total channels present in the cellular system, what is the percentage of voice and control channels?
a) 95% voice channels, 5% control channels
b) 5% voice channels, 95% control channels
c) 50% voice channels, 50% control channels
d) 25% voice channels, 75% control channels
View Answer
Answer: a
Explanation: In each cellular system, control channels are 5% of the total channels available and remaining 95% are dedicated to voice and data traffic.

22. What is MIN?
a) Subscriber’s telephone number
b) Paging message
c) Traffic request number
d) Mobile Internet
View Answer
Answer: a
Explanation: MIN (Mobile Identification Number) is a 10 digit unique number which represents the telephone number of subscriber.

23. What is transmitted along with the call initiation request during the origin of call by a mobile?
a) MIN
b) ESN
c) ESN and SCM
d) MIN, ESN and SCM
View Answer
Answer: d
Explanation: When a mobile originates the call, it sends the MIN (mobile identification number), ESN (electronic serial number) and SCM (station class mark) along with the call initiation request.

24. What does SCM indicates?
a) Maximum receiver power level for a particular user
b) Maximum transmitter power level for a particular user
c) Minimum receiver power level for a particular user
d) Minimum transmitter power level for a particular user
View Answer
Answer: b
Explanation: SCM (Station Class Mark) indicates the maximum transmitter power level for a particular user.

25. What is the shape of the cell present in the cellular system?
a) Circular
b) Square
c) Hexagonal
d) Triangular
View Answer
Answer: c
Explanation: The shape of the cell present in the cellular network is hexagonal since it can cover the entire geographical area without any gap and overlapping.

26. Why the size of the cell is kept small in cellular network?
a) Increase capacity
b) Decrease capacity
c) Increased size of base station electronics
d) Slow process of handoffs
View Answer
Answer: a
Explanation: The size of the cells in cellular network is kept small because of the need of high capacity in areas with high user density and reduced size and cost of base station electronics.

27. What is handoff?
a) Forward channel
b) Switching technique
c) Roamer
d) Guard channel
View Answer
Answer: b
Explanation: Handoff is a switching technique which refers to the process of transferring an active call or data session from one cell in a cellular network to another.

28. Which one is not an advantage of using frequency reuse?
a) Increased capacity
b) Limited spectrum is required
c) Same spectrum may be allocated to other network
d) Number of base stations is reduced
View Answer

Answer: d
Explanation: Frequency reuse is a technique of reusing frequencies and channels within a cellular system to improve capacity and spectral efficiency.

29. The process of transferring a mobile station from one base station to another is _____
a) MSC
b) Roamer
c) Handoff
d) Forward channel
View Answer
Answer: c
Explanation: Handoff is the process of changing the channel associated with current connection while a call is in progress.

30. The interference between the neighbouring base stations is avoided by _____
a) Assigning different group of channels
b) Using transmitters with different power level
c) Using different antennas
d) Using different base stations
View Answer
Answer: a
Explanation: The interference between the neighbouring base stations is avoided by assigning different group of channels and reusing the same channel after a certain amount of distance.

31. Which of the following multiple access techniques are used by second generation cellular systems?
a) FDMA/FDD and TDMA/FDD
b) TDMA/FDD and CDMA/FDD
c) FDMA/FDD and CDMA/FDD
d) FDMA/FDD only
View Answer
Answer: b
Explanation: First generation cellular system used FDMA/FDD techniques. Second generation standards uses TDMA/FDD and CDMA/FDD multiple access techniques. 2G networks are digital.

32. Which one is not a TDMA standard of second generation networks?
a) GSM
b) IS-136
c) AMPS
d) PDC
View Answer
Answer: c
Explanation: GSM (Global System Mobile), IS-136 (Interim Standard 136) and PDC (Pacific Digital Cellular) are the three most popular TDMA standards of second generation. AMPS is a first generation standard.

33. Which of the following is a CDMA standard of second generation network?
a) IS-95
b) IS-136
c) ETACS
d) EDGE
View Answer
Answer: a
Explanation: Interim Standard 95 (IS-95) is the most popular CDMA standard of second generation networks. IS-136 is a TDMA standard of 2G. EDGE is a standard of 2.5G and ETACS is a 1G standard.

34. Popular 2G CDMA standard IS-95 is also known as _____
a) CdmaOne
b) CdmaTwo
c) IS-136
d) IS-95B
View Answer
Answer: a
Explanation: The popular 2G CDMA standard, Interim Standard (IS-95) is also known as CdmaOne. The 2.5G CDMA standard, IS-95B is called CdmaTwo. And IS-136 is a TDMA standard for 2G.

35. How many users or voice channels are supported for each 200 KHz channel in GSM?
a) Eight
b) Three
c) Sixty four
d) Twelve
View Answer
Answer: a
Explanation: GSM is a circuit switched system that divides each 200 KHz channel into eight 25 KHz time slots, i.e. each radio channel is divided into eight voice channels.

36. How many voice channels are supported for each 30 KHz radio channel in IS-136?
a) Eight
b) Thirty
c) Three
d) Sixteen
View Answer
Answer: c
Explanation: Interim Standard 136 (IS-136) was popularly known as North American Digital Cellular (NADC) system. It divides each 30 KHz radio channel into three time slots, each of 10 KHz.

37. How many users are supported in IS-95 for each 1.25 MHz?
a) Eight
b) Sixty four
c) Sixteen
d) Twenty five
View Answer

Answer: b
Explanation: IS-95 supports upto 64 users which are orthogonally coded and simultaneously transmitted on each 1.25 MHz. The services of IS-95 standard are short messaging service, slotted paging, over-the-air activation, enhanced mobile station identities etc.

38. Which modulation technique is used by GSM?
a) GMSK
b) BPSK
c) QPSK
d) GFSK
View Answer
Answer: a
Explanation: GSM uses a form of modulation known as GMSK (Gaussian Minimum Shift Keying). It is a form of modulation with no phase discontinuities and provides data transmission with efficient spectrum usage.

39. IS-95 uses which modulation technique?
a) GMSK
b) BPSK
c) QAM
d) AFSK
View Answer
Answer: b
Explanation: IS- 95 uses BPSK (Binary Phase Shift Keying) with quadrature spreading. It is regarded as one of the most robust digital modulation technique and is used for long distance wireless communication.

40. IS-136 uses which modulation technique?
a) π/4 DQPSK
b) BPSK
c) GMSK
d) AFSK
View Answer
Answer: a
Explanation: IS-136 uses π/4 DQPSK modulation technique. This technique allows a bit rate of 48.6 Kbit/s with 30 KHz channel spacing which gives a bandwidth efficiency of 1.62 bit/s/Hz.

41. Which is one of the disadvantages of 2G standards?
a) Short Messaging Service (SMS)
b) Digital modulation
c) Limited capacity
d) Limited Internet Browsing
View Answer
Answer: d
Explanation: 2G technologies use circuit switched data modems that limits data users to a single circuit switched voice channel. The advantages of 2G network are that they are digital in nature and supports SMS service.

42. GSM (Global System for Mobile) was earlier also known as _____
a) Group System Mobile
b) Global Special Meaning
c) Group Special Mobile
d) Global Special Mobile
View Answer
Answer: c
Explanation: GSM was earlier known as Group Special Mobile. As it became more global, the meaning of acronym was changed to Global System for Mobile.

43. 2G CDMA standard, IS-95, was proposed by which company?
a) Nippon Telephone and Telegraph (NTT)
b) Qualcomm
c) Bellcore and Motorola
d) AT&T Bell Laboratories
View Answer
Answer: b
Explanation: IS-95 was proposed by Qualcomm in early 1990s. Later it was adopted as a standard by Telecommunications Industry Association in TIA/EIA/IS-95 release published in 1995.

44. Which one of the following 2G standard is used in Japan?
a) IS-136
b) GSM
c) PDC
d) AMPS
View Answer
Answer: c
Explanation: PDC (Personal Digital Cellular) was standardized by Japanese Ministry of Posts and Telecommunication in 1991. It is similar to IS- 136, but with 25 KHz voice channels to be compatible with the Japanese analog channels.

45. The 2G GSM technology uses a carrier separation of _____
a) 1.25 MHz
b) 200 KHz
c) 30 KHz
d) 300 KHz
View Answer
Answer: b
Explanation: The Global System for Mobile (GSM) uses a carrier separation of 200 KHz, each channel supporting upto eight users.

46. What is the name of the web browsing format language supported by 2.5G technology?
a) Wireless Application Protocol
b) Hypertext Markup Language
c) Extensible Markup Language
d) Hypertext Transfer Protocol
View Answer

Answer: a
Explanation: 2.5G technology supports a new web browsing format language, which is called Wireless Application Protocol (WAP). It allows standard web pages to be viewed in a compressed format specifically designed for small, portable hand held wireless devices.

47. What is the name of the internet microbrowser technology used by NTT DoCoMo in Japan?
a) Wireless Application Protocol
b) I-mode
c).W-mode
d) Hypertext Markup Language
View Answer
Answer: b
Explanation: I-mode is a wireless data service and Internet microbrowser technology introduced by NTT DoCoMo on its PDC network in 1998. It is currently used by other wireless services throughout the world.

48. 2.5G upgrade path for a particular wireless carrier does not match the original 2G technology choice made earlier by the same carrier.
a) True
b) False
View Answer
Answer: b
Explanation: As 2.5G is the upgradation of 2G technology, 2.5G upgradation path must match the original 2G technology. For example, 2.5G upgrade solution designed for GSM must dovetail with original GSM interface so that change of hardware is not required.

49. Which of the following is not a TDMA standard of 2.5G network?
a) HSCSD
b) GPRS
c) EDGE
d) GSM
View Answer
Answer: d
Explanation: GSM (Global System for Mobile) is a TDMA standard for 2G network. HSCSD (High Speed Circuit Switched Data), GPRS (General Packet Radio Service) and EDGE (Enhanced Data rates for GSM Evolution) are TDMA standards of 2.5G technology.

50. Which of the following is a 2.5G CDMA standard?
a) IS-95
b) Cdma2000
c) IS-95B
d) CdmaOne
View Answer
Answer: c
Explanation: IS-95B (Interim Standard 95B) is code division multiple access standard for 2.5G. It is an upgradation of IS- 95 which is a second generation standard of CDMA.

51. HSCSD supports which 2G standard?
a) GSM

b) IS-136
c) GSM and IS-136
d) PDC
View Answer
Answer: a
Explanation: High Speed Circuit Switched Data (HSCDC) supports the Global system for Mobile (GSM) standard. It only requires a software upgrade at the base station.

52. How does HSCSD differs from the GSM to obtain higher speed data rate?
a) By allowing single user to use one specific time slot
b) By allowing single user to use consecutive user time slots
c) By using 8-PSK modulation technique
d) By allowing multiple users to use individual time slot
View Answer
Answer: b
Explanation: HSCSD allows individual data users to use consecutive time slots in order to obtain higher speed data access on the GSM network. In case of GSM, it limits each user to use only one specific time slot.

53. GPRS and EDGE supports which 2G standard?
a) GSM only
b) IS-136 only
c) GSM and IS-136 both
d) PDC
View Answer
Answer: c
Explanation: GPRS (General Packet Radio Service) network provides a packet network on dedicated GSM or IS-136 radio channels. EDGE (Enhanced Data rates for GSM Evolution) is also developed keeping in desire both GSM and IS-136 operators.

54. How is HSCSD different from GPRS?
a) Infrastructure
b) Multiple Access Scheme
c) Modulation technique
d) Switching Technique
View Answer
Answer: d
Explanation: GPRS is a packet based network. HSCSD dedicates circuit switched channels to specific users whereas GPRS supports many more users, but in a bursty manner.

55. What changes GPRS need to acquire while upgrading itself from GSM?
a) A whole new base station
b) New transceiver at base station
c) New channel cards
d) New packet overlay including routers and gateways
View Answer
Answer: d
Explanation: GPRS requires a GSM operator to install new routers and Internet gateways at

the base station along with new software upgrade. New base station RF hardware is not required.

56. Which new modulation technique is used by EDGE?
a) BPSK
b) 8- PSK
c) DQPSK
d) AFSK
View Answer
Answer: b
Explanation: EDGE uses a new digital modulation format, 8- PSK (Octal Phase Shift Keying). It is used in addition to GSM's standard GMSK (Gaussian Minimum Shift Keying) modulation.

57. Various air interface formats used by EDGE are also known as _____
a) Modulation and coding schemes
b) Coding schemes
c) Modulating air interface
d) Air interface coding schemes
View Answer
Answer: a
Explanation: EDGE allows nine different air interface formats known as multiple modulation and coding schemes (MCS). Each MCS state may use either GMSK or 8- PSK modulation for network access, depending upon the instantaneous demands of the network and the operating conditions.

58. EDGE is sometimes also referred as _____
a) HSCSD
b) 3GPP
c) EGPRS
d) EGSCSD
View Answer
Answer: c
Explanation: EDGE is sometimes also referred as Enhanced GPRS (EGPRS). It is an enhancement of a GSM network in which EDGE is introduced on top of the General Packet Radio Service (GPRS). It is used to transfer data in a packet switched mode on various time slots.

59. What is one disadvantage of EDGE in comparison to HSCSD and GPRS?
a) Low data rates
b) Small coverage range
c) Low speed
d) No advancement
View Answer
Answer: b
Explanation: Because of the higher data rates and relaxed error control covering in many of the selectable air interface formats, the coverage range is smaller in EDGE than in HSCSD or GPRS.

60. Which of the following is not a characteristic of 3G network?
a) Communication over VoIP
b) Unparalleled network capacity
c) Multi-megabit Internet access
d) LTE based network
View Answer
Answer: d
Explanation: Multi-megabit Internet access, communication using Voice over internet Protocol (VoIP), voice activated calls, unparalleled network capacity are some of the characteristics of 3G network. 3G systems promise unparalleled wireless access which is not possible in 2G systems. LTE (Long term Evolution) is a standard of 4G systems.

61. What is the term used by ITU for a set of global standards of 3G systems?
a) IMT 2000
b) GSM
c) CDMA
d) EDGE
View Answer
Answer: a
Explanation: International Telecommunications Union (ITU) used the term IMT-2000 in 1998. It is used for a set of global standards for third generation (3G) mobile telecoms services and equipment.

62. Which of the following leads to evolution of 3G networks in CDMA systems?
a) IS-95
b) IS-95B
c) CdmaOne
d) Cdma2000
View Answer
Answer: d
Explanation: 3G evolution of CDMA system leads to cdma2000. It is based on the fundamentals of IS-95 and IS-95B. IS-95 is a 2G standard for CDMA systems. IS-95B is a CDMA system for 2.5G networks.

63. 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
View Answer
Answer: a
Explanation: The 3G evolution for GSM, IS-136 and PDC systems leads to W-CDMA (Wideband CDMA). It is based on the network fundamentals of GSM, as well as merged versions of GSM and IS-136 through EDGE. GPRS, EDGE and HSCSD are 2.5G networks.

64. What is 3GPP?
a) Project based on W-CDMA
b) Project based on cdma2000
c) Project based on 2G standards

d) Project based on 2.5G standards
View Answer
Answer: a
Explanation: 3GPP is a 3G Partnership Project for Wideband CDMA standards based on backward compatibility with GSM and IS-136. The project was established in December 1998. Its initial scope was to make a globally applicable third generation mobile phone system.

65. What is 3GPP2?
a) Project based on W-CDMA
b) Project based on cdma2000
c) Project based on 2G standards
d) Project based on 2.5G standards
View Answer
Answer: b
Explanation: 3GPP2 is a 3G Partnership Project for Cdma2000 standards based on backward compatibility with earlier CdmaOne 2G CDMA technology. It was initiated by IMT-2000 to cover high speed, broadband and Internet Protocol (IP) based mobile systems. It mainly focuses on North American and Asian regions.

66. Which of the following is not a standard of 3G?
a) UMTS
b) Cdma2000
c) TD-SCDMA
d) LTE
View Answer
Answer: d
Explanation: UMTS (Universal Mobile Telecommunication System), TD-SCDMA (Time Division Synchronous Code Division Multiple Access), Cdma2000 are the standards defined for 3G networks. LTE (Long Term Evolution) is a 4G standard for high speed wireless communication.

67. Which of the following 3G standard is used in Japan?
a) Cdma2000
b) TD-SCDMA
c) UMTS
d) UTRA
View Answer
Answer: c
Explanation: Japan uses UMTS (W-CDMA) standard for its 3G network. The standards used are UMTS 800, UMTS 900, UMTS 1500, UMTS 1700 and UMTS 2100. They are standardized by ARIB (Association of Radio industries and Business).

68. What does the number 2000 in IMT-2000 signifies?
a) Year
b) Number of subscribers per cell
c) Number of cells
d) Area (Km)
View Answer

Answer: a
Explanation: The International Telecommunication Union (ITU) defined the third generation (3G) of mobile telephony standards, IMT-2000 to facilitate growth, increase bandwidth, and support more diverse applications. The number 2000 in IMT-2000 indicates the start of the system (year 2000) and the spectrum used (around 2000 MHz).

69. Which of the following is not an application of third generation network?
a) Global Positioning System (GPS)
b) Video conferencing
c) Mobile TV
d) Downloading rate upto 1 Gbps
View Answer
Answer: d
Explanation: 3G applications include GPS (Global Positioning System), MMS (Multimedia Messaging System), video conferencing, location based services, video on demand, wireless voice telephony and high data rates with peak downloading rate of 100 Mbps. For 4G networks, the peak downloading rate is 1 Gbps.

70. What is the full form of WLAN?
a) Wide Local Area Network
b) Wireless Local Area Network
c) Wireless Land Access Network
d) Wireless Local Area Node
View Answer
Answer: b
Explanation: WLAN stands for Wireless Local Area Network. Wireless networks is increasingly used as a replacement for wires within homes, buildings, and office settings through the deployment of wireless local area networks (WLANs).

71. WLANs use high power levels and generally require a license for spectrum use.
a) True
b) False
View Answer
Answer: b
Explanation: WLANs use low power and generally do not require a license for spectrum. They provide ad hoc high data transmission rate connections deployed by individuals. In the late 1980s, FCC provided licence free bands for low power spread spectrum devices in ISM band, which is used by WLAN.

72. What is the name of 300 MHz of unlicensed spectrum allocated by FCC in ISM band?
a) UNII
b) Unlicensed PCS
c) Millimetre wave
d) Bluetooth
View Answer
Answer: a
Explanation: FCC allocated 300 MHz of unlicensed spectrum in the ISM bands. This allocation is called the Unlicensed National Information Infrastructure (UNII) band. It was

allocated for the express purpose of supporting low power license free spread spectrum data communication.

73. Which of the following specifies a set of media access control (MAC) and physical layer specifications for implementing WLANs?
a) IEEE 802.16
b) IEEE 802.3
c) IEEE 802.11
d) IEEE 802.15
View Answer
Answer: c
Explanation: IEEE 802.11 is a set of media access control and physical layer specification for implementing WLAN computer communication. It was founded in 1987 to begin standardization of spread spectrum WLANs for use in the ISM bands.

74. Which of the following is not a standard of WLAN?
a) HIPER-LAN
b) HIPERLAN/2
c) IEEE 802.11b
d) AMPS
View Answer
Answer: d
Explanation: AMPS is a standard of first generation network. HIPERLAN is a WLAN standard developed in Europe in mid 1990s. HIPERLAN/2 is also developed in Europe that provides upto 54 Mbps of user data.

75. Which of the following is the 802.11 High Rate Standard?
a) IEEE 802.15
b) IEEE 802.15.4
c) IEEE 802.11g
d) IEEE 802.11b
View Answer
Answer: d
Explanation: IEEE 802.11b was a high rate standard approved in 1999. It provided new data rate capabilities of 11 Mbps, 5.5 Mbps in addition to the original 2 Mbps and 1 Mbps user rates of IEEE 802.11.

76. Which of the following spread spectrum techniques were used in the original IEEE 802.11 standard?
a) FHSS and DSSS
b) THSS and FHSS
c) THSS and DSSS
d) Hybrid technique
View Answer
Answer: a
Explanation: Original IEEE 802.11 used both the approaches of FHSS (Frequency Hopping Spread Spectrum) and DSSS (Direct Sequence Spread Spectrum). But from late 2001s, only DSSS modems are used within IEEE 802.11.

77. Which of the following WLAN standard has been named Wi-Fi?
a) IEEE 802.6
b) IEEE 802.15.4
c) DSSS IEEE 802.11b
d) IEEE 802.11g
View Answer
Answer: c
Explanation: The DSSS IEEE 802.11b standard has been named Wi-Fi by the Wireless Ethernet Compatibility Alliance. It is a group that promotes adoption of 802.11 DSSS WLAN.

78. Which of the following is developing CCK-OFDM?
a) IEEE 802.11a
b) IEEE 802.11b
c) IEEE 802.15.4
d) IEEE 802.11g
View Answer
Answer: d
Explanation: IEEE 802.11g is developing CCK-OFDM (Complementary Code Keying Orthogonal Frequency Division Multiplexing) standards. It will support roaming capabilities and dual band use for public WLAN networks. It also has backward compatibility with 802.11b technologies.

80. What is the data rate of HomeRF 2.0?
a) 10 Mbps
b) 54 Mbps
c) 200 Mbps
d) 1 Mbps
View Answer
Answer: a
Explanation: HomeRF 2.0 has data rate of the order of 10 Mbps. The FHSS proponents of IEEE 802.11 have formed the HomeRF standard that supports the frequency hopping equipment. In 2001, HomeRF developed a 10 Mbps FHSS standard called HomeRF 2.0.

81. HIPER-LAN stands for _____
a) High Precision Radio Local Area Network
b) High Performance Radio Local Area Network
c) High Precision Radio Land Area Network
d) Huge Performance Radio Link Access Node
View Answer
Answer: b
Explanation: HIPER-LAN stands for High Performance Radio Local Area Network. It was developed in Europe in mid 1990s. It was intended to provide individual wireless LANs for computer communication.

82. Cellular concept replaces many low power transmitters to a single high power transmitter.
a) True

b) False
View Answer
Answer: b
Explanation: Cellular concept is a system level idea that replaces a single high power transmitter to many low power transmitters. High power transmitters lead to large cell, and thus it was impossible to use the same frequencies throughout the systems. But, it is possible with low power transmitter.

83. Why neighbouring stations are assigned different group of channels in cellular system?
a) To minimize interference
b) To minimize area
c) To maximize throughput
d) To maximize capacity of each cell
View Answer
Answer: a
Explanation: Neighbouring base stations are assigned different group of channels. It minimizes the interference between base stations and the users under their control.

84. What is a cell in cellular system?
a) A group of cells
b) A group of subscribers
c) A small geographical area
d) A large group of mobile systems
View Answer
Answer: c
Explanation: Cell is a small geographic area in a cellular system. Each cellular base station within a cell is allocated a group of radio channels that could be used in another cell.

85. What is frequency reuse?
a) Process of selecting and allocating channels
b) Process of selection of mobile users
c) Process of selecting frequency of mobile equipment
d) Process of selection of number of cells
View Answer
Answer: a
Explanation: Frequency reuse is the process of using the same radio frequencies on radio transmitter sites within a geographic area. They are separated by sufficient distance to cause minimal interference with each other.

86. Which of the following is a universally adopted shape of cell?
a) Square
b) Circle
c) Triangle
d) Hexagon
View Answer
Answer: d
Explanation: Hexagonal cell shape is a simplistic model of radio coverage for each base station. It has been universally adopted since the hexagon permits easy and manageable analysis of a cellular system.

87. Actual radio coverage of a cell is called _____
a) Fingerprint
b) Footprint
c) Imprint
d) Matrix
View Answer
Answer: b
Explanation: Actual radio coverage of a cell is known as the footprint. It is determined from field measurements or propagation prediction models. Although the real footprint is amorphous in nature, a regular cell shape is needed for systematic system design.

88. Why the shape of cell is not circle?
a) Omni directionality
b) Small area
c) Overlapping regions or gaps are left
d) Complex design
View Answer
Answer: c
Explanation: Circle is the first natural choice to represent the coverage area of a base station. But while adopting this shape, adjacent cells cannot be overlaid upon a map without leaving gaps or creating overlapping regions.

89. What is the main reason to adopt hexagon shape in comparison to square and triangle?
a) Largest area
b) Simple design
c) Small area
d) Single directional
View Answer
Answer: a
Explanation: For a given distance between the center of a polygon and its farthest perimeter points, the hexagon has the largest area. Thus, by using the hexagon geometry, the fewest number of cells can cover a geographic region.

90. Which type of antenna is used for center excited cells?
a) Dipole antenna
b) Grid antenna
c) Sectored antenna
d) Omnidirectional antenna
View Answer
Answer: d
Explanation: For center excited cells, base station transmitters are used at the center of cell. To cover the whole cell, omnidirectional antenna is the best choice for base station transmitters.

91. Which type of antenna is used for edge excited cells?
a) Omnidirectional antenna
b) Grid antenna
c) Sectored directional antenna

d) Dipole antenna
View Answer
Answer: c
Explanation: For edge excited cell, mostly base station transmitters are placed on three of the six cell vertices. To cover the assigned portion of a cell, sectored directional antenna is the best choice.

92. For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
a) S=k*N
b) S=k/N
c) S=N/k
d) $S=k^N$
View Answer
Answer: a
Explanation: If there is a cellular system with total of S duplex channels. Each cell is allocated a group of k channels and there are total N cells in the system, S channels are divide among N cells into unique and disjoint channel groups. Therefore, total number of radio channel is the product of total number of cells in the system (N) and number of channel allocated to each cell (k).

93. What is a cluster in a cellular system?
a) Group of frequencies
b) Group of cells
c) Group of subscribers
d) Group of mobile systems
View Answer
Answer: b
Explanation: Cluster is group of N cells. These cells use the complete set of frequency available for the cellular system at that location.

94. What is a frequency reuse factor for N number of cells in a system?
a) N
b) N^2
c) 2*N
d) 1/N
View Answer
Answer: d
Explanation: The frequency reuse factor is defined as 1 over the number of cells in the cluster of the system (N). It is given by 1/N since each cell within a cluster is only assigned 1/N of the total available channels in the system.

95. Capacity of a cellular system is directly proportional to _____
a) Number of cells
b) Number of times a cluster is replicated
c) Number of Base stations
d) Number of users
View Answer

Answer: b
Explanation: The capacity of a cellular system is directly proportional to the number of times a cluster is replicated in a fixed area. If the cluster size N is reduced while the cell size is kept constant, more clusters are required to cover a given area, and hence more capacity is achieved.

96. A spectrum of 30 MHz is allocated to a cellular system which uses two 25 KHz simplex channels to provide full duplex voice channels. What is the number of channels available per cell for 4 cell reuse factor?
a) 150 channels
b) 600 channels
c) 50 channels
d) 85 channels
View Answer
Answer: a
Explanation: Total bandwidth is 30 MHz. And the channel bandwidth is 50 KHz/duplex channel (25KHz*2). Therefore, total available channels are 600 channels (30,000/50). For 4 cell reuse factor, total number of channels available per cell will be 150 channels (600/4).

97. Which of the following is not an objective for channel assignment strategies?
a) Efficient utilization of spectrum
b) Increase of capacity
c) Minimize the interference
d) Maximize the interference
View Answer
Answer: d
Explanation: The objective of channel assignment strategy is to utilize the spectrum efficiently. And for efficient utilization, a frequency reuse scheme consistent with the objective of increasing capacity and minimizing interference is required.

98. The choice of channel assignment strategy does not impact the performance of the system.
a) True
b) False
View Answer
Answer: b
Explanation: The choice of channel assignment strategy impacts the performance of the system. Particularly as to how calls are managed, when a mobile user is handed off from one cell to another.

99.In fixed channel assignment strategy, each cell is allocated a predetermined set of _____
a) Voice channels
b) Control channels
c) Frequency
d) base stations
View Answer
Answer: a
Explanation: In a foxed channel strategy, each cell is allocated a predetermined set of voice

channels. Any call attempt within the cell can only be served by the unused channels in that particular cell.

100. What happen to a call in fixed channel strategy, if all the channels in a cell are occupied?
a) Queued
b) Cross talk
c) Blocked
d) Delayed
View Answer
Answer: c
Explanation: As any call attempt within a cell can be served by unused channels in fixed channel strategy. If all the channels in that cell are occupied, the call is blocked and subscriber does not receive any service.

101. What is a borrowing strategy in fixed channel assignments?
a) Borrowing channels from neighbouring cell
b) Borrowing channels from neighbouring cluster
c) Borrowing channels from same cell
d) Borrowing channels from other base station in same cell
View Answer
Answer: a
Explanation: In borrowing strategy, a cell is allowed to borrow channels from a neighbouring cell if all of its own channels are already occupied. The MSC supervises such borrowing procedure and ensures that the borrowing of channel does not interfere with any call in progress.

102. In dynamic channel assignment strategy, voice channels are allocated to different cells permanently.
a) True
b) False
View Answer
Answer: b
Explanation: In a dynamic channel strategy, voice channels are not allocated to different cells permanently. Instead, serving base station requests a channel from MSC each time a cell request is made.

103. In dynamic channel assignment strategy, base station requests channel from _____
a) MSC
b) Neighbouring cell
c) Neighbouring cluster
d) Neighbouring base station
View Answer
Answer: a
Explanation: Each time a call request is made, the serving base station requests a channel from the MSC. The switch then allocates a channel to the requested cell following an algorithm that takes into account the likelihood of future blocking within the cell.

104. Dynamic channel assignment reduces the likelihood of blocking in comparison to fixed channel assignment.
a) True
b) False
View Answer
Answer: a
Explanation: Dynamic channel assignment reduces the likelihood of blocking. Accordingly, the MSC only allocates a given frequency if that frequency is not presently in use in the cell or any other cell which falls within the minimum restricted distance of frequency reuse.

105. RSSI stands for _____
a) Received Signal Strength Indicator
b) Restricted Signal Strength Indicator
c) Radio Signal Strength Indication
d) Restricted System Software Indicator
View Answer
Answer: a
Explanation: Received signal strength indicator (RSSI) is a measurement of the power present in a received radio signal. RSSI is usually invisible to a user of a receiving device.

106. What is the drawback of dynamic channel assignment?
a) Decrease channel utilization
b) Increase probability of blocked call
c) Cross talk
d) Increase storage and computational load on system
View Answer
Answer: d
Explanation: Dynamic channel assignment requires the MSC to collect real time data on channel occupancy, traffic distribution and RSSI of all channels on continuous basis. This increases the storage and computational load on the system but provides the advantage of increased channel utilization and decreased probability of blocked call.

107. What is the condition for handoff?
a) A mobile moves into a different cell while in conversation
b) A mobile remains in the same cell while in conversation
c) A mobile moves to different cell when idle
d) A mobile remains in the same cell and is idle
View Answer
Answer: a
Explanation: Handoff occurs when a mobile moves into a different cell while a conversation is in progress. The MSC automatically transfers the call to a new channel belonging to the new base station.

108. Handoff does not require voice and control channel to be allocated to channels associated with the new base station.
a) True
b) False
View Answer

Answer: b
Explanation: Handoff operation involves identifying a new base station. It also requires that the voice and control signal be allocated to channels associated with the new base station.

109. The time over which a call can be maintained within a cell without handoff is called _____
a) Run time
b) Peak time
c) Dwell time
d) Cell time
View Answer
Answer: c
Explanation: The time over which a call is maintained within a cell without handoff is called as dwell time. Dwell time vary depending on speed of user and type of radio coverage.

110. Dwell time does not depend on which of the following factor?
a) Propagation
b) Interference
c) Distance between subscriber and base station
d) Mobile station
View Answer
Answer: d
Explanation: Dwell time of a particular user is governed by a number of factors. They include propagation, interference, distance between the subscriber and the base station, and other time varying effects.

111. Which of the following is associated with the handoff in first generation analog cellular systems?
a) Locator receiver
b) MAHO
c) Cell dragging
d) Breathing cell
View Answer
Answer: a
Explanation: Locator receiver is a spare receiver in each base station. It is used to scan and determine signal strengths of mobile users which are in neighbouring cells.

112. MAHO stands for _____
a) MSC assisted handoff
b) Mobile assisted handoff
c) Machine assisted handoff
d) Man assisted handoff
View Answer
Answer: b
Explanation: MAHO stands for mobile assisted handoff. In 2G systems, handoff decisions are mobile assisted. In MAHO, every mobile station measure the received power from surrounding base station and continuously reports the results to serving base station.

113. A handoff is initiated when the power received from the base station of a neighbouring cell falls behind the power received from the current base station by certain level.

a) True
b) False
View Answer
Answer: b
Explanation: MAHO measures the power received from the surrounding base station. And a handoff is initiated when the power received from the base station of a neighbouring cell begins to exceed the power received from current base station.

114. What is the condition for intersystem interference?
a) Mobile moves from one cell to another cell
b) Mobile remains in the same cell
c) Mobile moves from one cellular system to another cellular system
d) Mobile remains in the same cluster
View Answer
Answer: c
Explanation: An intersystem handoff is initiated when a mobile moves from one cellular system to another during a course of a call. An MSC engages in an intersystem interference when a mobile becomes weak in a given cell and MSC cannot find another cell to which call can be transferred.

115. What is the disadvantage of guard channel?
a) Efficient utilization of spectrum
b) Cross talk
c) Near far effect
d) Reduce total carried traffic
View Answer
Answer: d
Explanation: Guard channel is a concept for handling priority in handoff. Here, a fraction of the total available channels in a cell is reserved exclusively for handoff requests from ongoing calls. This method has the disadvantage of reducing the total carried traffic, as fewer channels are allocated to originating calls.

116. Which of the following priority handoff method decrease the probability of forced termination of a call due to lack of available channels?
a) Queuing
b) Guard channel
c) Cell dragging
d) Near far effect
View Answer
Answer: a
Explanation: Queuing of handoff requests is a method to decrease the probability of forced termination of a call due to lack of available channels. Queuing of handoff is possible due to the fact that there is a finite time interval between the time the received signal level drops below the handoff threshold and the time the call is terminated.

117. Umbrella cell approach is possible by using _____
a) Antenna of same heights
b) Antenna of different heights
c) Different voice channels

d) Different control channels
View Answer
Answer: b
Explanation: Umbrella cell approach is possible by using different antenna heights and different power levels. By using this approach, it is possible to provide large and small cells which are co-located at a single location.

118. Cell dragging is a problem occur due to _____
a) Pedestrian users
b) Stationary users
c) High speed mobile systems
d) Base stations having same frequency
View Answer
Answer: a
Explanation: Cell dragging is a practical handoff problem in microcell system. It results from pedestrian users that provide a very strong signal to the base station.

119. What was the typical handoff time in first generation analog cellular systems?
a) 1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: b
Explanation: In first generation analog cellular system, the typical time to make a handoff once the signal level is below the threshold, is about 10 seconds. This requires the value for threshold to be 6 dB to 12 dB.

120. How much time it takes for handoff in digital cellular systems like GSM?
a) 1 second
b) 10 seconds
c) 1 minute
d) 10 milliseconds
View Answer
Answer: a
Explanation: In digital cellular systems, the mobile assista with the handoff procedure by determining the best candidate. Once the decision is made, it typically requires 1 to 2 seconds for handoff.

121. Soft handoff is also known as _____
a) MAHO
b) Hand over
c) Break before make
d) Make before break
View Answer
Answer: d
Explanation: Soft handoff is one in which the channel in the source cell is retained and used for a while in parallel with the channel in the target cell. In this case, the connection with the

receiver target is established before the connection to the source is broken, hence this handover is called make-before-break.

123. Which of the following is not a source of interference?
a) Base station in a different cluster
b) Another mobile in same cell
c) A call in progress in neighbouring cell
d) Any BS operating on same frequency
View Answer
Answer: a
Explanation: Interference is a major limiting factor in the performance of cellular radio systems. Sources of interference includes another mobile in the same cell, a call in progress in neighbouring cell, other base stations operating in the same frequency band, or any non-cellular system which inadvertently leaks energy into the cellular frequency band.

124. Interference on voice channels causes _____
a) Blocked calls
b) Cross talk
c) Queuing
d) Missed calls
View Answer
Answer: b
Explanation: Interference on voice channels causes crass talk. Here, the subscriber hears interference in the background due to an undesired transmission.

125. Interference in control channel leads to _____
a) Cross talk
b) Queuing
c) Blocked calls
d) Voice traffic
View Answer
Answer: c
Explanation: On control channels, interference leads to missed and blocked calls. This happens due to errors in the digital signalling.

126. Interference is more severe in rural areas.
a) True
b) False
View Answer
Answer: a
Explanation: Interference is more severe in rural areas. It happens due to the greater RF noise floor and the large number of base stations and mobiles.

127. What are co-channel cells?
a) Cells having different base stations
b) Cells using different frequency
c) Cells using adjacent frequency
d) Cells using same frequency
View Answer

Answer: d
Explanation: Due to frequency reuse concept, there are several cells that use the same set of frequencies. These cells are called co-channel cells. And the interference between these cells is called co-channel interference.

128. Co-channel interference is a function of _____
a) Radius of cell
b) Transmitted power
c) Received power
d) Frequency of mobile user
View Answer
Answer: a
Explanation: This is the case when the size of each cell is approximately the same and the base stations transmit the same power. Co-channel interference ratio is independent of the transmitted power and becomes a function of the radius of the cell ® and the distance between centers of the nearest co channel cell (D).

129. Co-channel reuse ratio is define by _____
a) Q=D*R
b) Q=D/R
c) Q=D^R
d) Q=1/R
View Answer
Answer: b
Explanation: Co-channel reuse ratio is defined by Q=D/R. By increasing the ratio of D/R, the spatial separation between co-channel cells relative to the coverage distance of a cell is increased. Thus, interference I reduced from improved isolation of RF energy from the co-channel cells.

130. Co-channel ratio in terms of cluster size is defined as _____
a) $(3N)^{----\sqrt{}}$
b) N
c) 3N
d) √N
View Answer
Answer: a
Explanation: Co-channel reuse is defined using $(3N)^{----\sqrt{}}$. A small value of Q provides larger capacity since the cluster size N is small. However, a large value of Q improves the transmission quality, due to smaller level of co-channel interference.

131. What is the cluster size for CDMA?
a) N=10
b) N=100
c) N=1
d) N=50
View Answer

Answer: c
Explanation: CDMA systems have a cluster size of N=1.Therefore, frequency reuse is not as difficult as for TDMA or first generation cellular systems.

132. What is breathing cell effect?
a) Fixed coverage region
b) Dynamic and time varying coverage region
c) Large coverage region
d) Very small coverage region
View Answer
Answer: b
Explanation: Breathing cell is a concept used by CDMA systems. They had a dynamic, time varying coverage region which varies depending on the instantaneous number of users on the CDMA radio channel.

133. Adjacent channel interference occurs due to _____
a) Power transmitted by Base station
b) MSCs
c) Same frequency of mobile users
d) Imperfect receiver filters
View Answer
Answer: d
Explanation: Interference resulting from signals which are adjacent in frequency to the desired signal is called adjacent channel interference. It results from imperfect receiver filters which allow nearby frequencies to leak into the passband.

134. Which of the following problem occur due to adjacent channel interference?
a) Blocked calls
b) Cross talk
c) Near-far effect
d) Missed calls
View Answer
Answer: c
Explanation: One of the main problems with adjacent channel interference is the near-far effect. It occurs when a mobile close to a base station transmits on a channel close to one being used by a weak mobile.

135. In near-far effect, a nearby transmitter captures the _____
a) Receiver of the subscriber
b) Transmitter of the subscriber
c) Nearby MSC
d) Neighbouring base station
View Answer
Answer: a
Explanation: Near-far effect occurs if an adjacent channel user is transmitting in very close range to a subscriber’s receiver while the receiver attempts to receive a base station on the desired channel. In this effect, a nearby transmitter captures the receiver of the subscriber.

136. Adjacent channel interference can be minimized through _____
a) Changing frequency of base stations

b) Careful filtering and channel assignments
c) Increasing number of base stations
d) Increasing number of control channels
View Answer
Answer: b
Explanation: Adjacent channel assignment can be minimized through careful filtering and channel assignments. Each cell is given only a fraction of the available channels, a cell need not be assigned channels which are all adjacent in frequency.

137. In dynamic channel assignment, any channel which is being used in one cell can be reassigned simultaneously to another cell in the system at a reasonable distance.
a) True
b) False
View Answer
Answer: a
Explanation: Dynamic channel assignment (DCA) is one well known solution to the micro cellular channel assignment problem. The dynamic nature of the strategy permits adaptation to spatial and traffic variations while the distribution of control reduces the requir
138. What is the concept for accommodating a large number of users in a limited radio spectrum?
a) Grade of service
b) Trunking
c) Multiplexing
d) Multitasking
View Answer
Answer: b
Explanation: Cellular radio systems rely on trunking to accommodate a large number of users in a limited radio spectrum. The concept of trunking allows a large number of users to share the relatively small number of channels in a cell by providing access to each user, on demand.

139. On termination of call, the occupied channel is not returned to the pool of available channels in trunking.
a) True
b) False
View Answer
Answer: b
Explanation: In a trunked radio system, each user is allocated a channel on a per call basis. Upon termination of the call, the previously occupied channel is immediately returned to the pool of available channels. It is a method for a system to provide network access to many clients by sharing a set of lines or frequencies instead of providing them individually.

140. In trunking system, when the channel is already in use, the call is blocked or queued.
a) True
b) False
View Answer
Answer: a
Explanation: In a trunked mobile radio system when a particular user requests service, there is a possibility that all the channels are already in use. Then the user is blocked, or

denied access to the system. Sometimes, a queue may be used to hold the requesting users until a channel becomes available.

141. Who developed the fundamental of trunking theory?
a) Newton
b) Ohm
c) Erlang
d) Einstein
View Answer
Answer: c
Explanation: The fundamentals of trunking theory were developed by Erlang. He was a Danish mathematician. He embarked on the study of how a large population could be accommodated by a limited number of servers in late 19th century.

142. What is the unit for the measure of traffic intensity?
a) Meters
b) Henry
c) Ohm
d) Erlang
View Answer
Answer: d
Explanation: The measure of traffic intensity is given by Erlang. It is defined as the ratio of the time during which a facility is cumulatively occupied to the time this facility is available for occupancy. Telecommunication operators are vitally interested in traffic intensity as it dictates the amount of equipment they must supply.

143. Which of the following techniques do not help in expanding the capacity of cellular system?
a) Sectoring
b) Scattering
c) Splitting
d) Microcell zone concept
View Answer
Answer: b
Explanation: As the demand for wireless service increases, the number of channels assigned to a call eventually becomes insufficient to support the required number of user. Techniques such as cell splitting, sectoring and coverage zone approaches are used in practice to expand the capacity of cellular system.

144. _____ uses directional antennas to control interference.
a) Sectoring
b) Cell splitting
c) Repeaters
d) Micro cell zone concept
View Answer
Answer: a
Explanation: Sectoring uses directional antenna to further control the interference and frequency reuse of channels. By decreasing the cell radius R and keeping the co-channel reuse ratio D/R unchanged, cell splitting increases the number of channels per unit area.

145. _____ allows an orderly growth of cellular system.
a) Sectoring
b) Scattering
c) Cell splitting
d) Micro cell zone technique
View Answer
Answer: c
Explanation: Cell splitting allows an orderly growth of cellular system. By defining new cells which have a smaller radius than the original cells, capacity increases due to additional number of channels per unit area.

146. Which of the following technology distributes the coverage of the cell and extends the cell boundary to hard-to-reach places?
a) Cell splitting
b) Scattering
c) Sectoring
d) Micro cell zone concept
View Answer
Answer: d
Explanation: Micro cell zone concept distributes the coverage of the cell and extends the cell boundary to hard-to reach places. It is the solution for the problem of increased number of handoffs when sectoring which results in an increase of load on switching.

147. Which of the following increases the number of base stations in order to increase capacity?
a) Cell splitting
b) Sectoring
c) Repeaters
d) Micro cell zone concept
View Answer
Answer: a
Explanation: Cell splitting increases the number of base stations in order to increase capacity. Whereas, sectoring and zone microcells rely on base station antenna placements to improve capacity by reducing co-channel interference.

148. Which of the following trunking inefficiencies?
a) Cell splitting
b) Micro cell zone technique
c) Sectoring
d) Repeaters
View Answer
Answer: c
Explanation: Sectored cells experience trunking inefficiencies. Cell splitting and zone micro cell techniques do not suffer the trunking inefficiencies experienced by sectored cells. They enable the base station to oversee all handoff chores related to microcells, thus reducing the computational load at MSC.

149. The process of subdividing a congested cell into smaller cells is called _____
a) Cell splitting

b) Sectoring
c) Micro cell technique
d) Repeaters
View Answer
Answer: a
Explanation: Cell splitting is the process of subdividing a congested cell into smaller cells. Each small cell has its own base station and a there is a corresponding reduction in antenna height and transmitter power.

150. Cell splitting increases the capacity of a cellular system since it increases the number of times _____ are reused.
a) Cells
b) Channels
c) Transmitters
d) Mobile stations
View Answer
Answer: b
Explanation: Cell splitting increases the capacity of a cellular system since it increases the number of times channels are reused. But it has a limitation that handoffs are more frequent and channel assignments become more difficult.

151. Cell splitting do not maintain the minimum c-channel reuse ratio.
a) True
b) False
View Answer
Answer: b
Explanation: Cell splitting allows a system to grow by replacing large cells with smaller cells. It does not upset the channel allocation scheme required to maintain the minimum co channel reuse ratio Q between co-channel cells.

152. Which of the following technique is used to limit radio coverage of newly formed microcells?
a) Sectoring
b) Splitting
c) Antenna downtilting
d) Scattering
View Answer
Answer: c
Explanation: Antenna downtilting deliberately focuses radiated energy from the base station toward the ground (rather than toward the horizon). It is often used to limit the radio coverage of newly formed microcells.

153. Sectoring increases SIR (Signal to Interference Ratio).
a) True
b) False
View Answer
Answer: a
Explanation: Sectoring increases SIR so that cluster size may be reduced. SIR is improved

using directional antenna. And then capacity improvement is achieved by reducing the number of cells in a cluster, thus increasing the frequency reuse.

154. Which of the following has range extension capability?
a) Sectoring
b) Repeaters
c) Scattering
d) Micro cell zone concept
View Answer
Answer: b
Explanation: Wireless operator needs to provide dedicated coverage for hard-to-reach areas, such as within buildings, or in valleys or tunnels. Radio transmitters used to provide such range extension capabilities are called as repeaters. They are bidirectional in nature.

155. Repeaters has one drawback of reradiating _____
a) Frequency
b) Channels
c) Power
d) Repeater noise and interference
View Answer
Answer: d
Explanation: Upon receiving signals from a base station forward link, the repeater amplifies and reradiates the base station signals to the specific coverage region. Unfortunately, the received noise and interference is also reradiated by repeater on both the forward and reverse link.

156. Which of the following is not an advantage of micro cell zone technique?
a) Reduced co channel interference
b) Improved signal quality
c) Increase in capacity
d) Increasing number of base stations
View Answer
Answer: d
Explanation: The advantage of the zone cell technique is that co-channel interference in the cellular system is reduced since a large central base station is replaced by several low powered transmitters on the edges of the cell. Thus, signal quality is reduced and it leads to an increase in capacity.

157. In a micro cell zone concept, when a mobile travels from one zone to another within the cell, it retains the same _____
a) Power level
b) Base station
c) Channel
d) Receiver
View Answer
Answer: c
Explanation: As a mobile travels from one zone to another within the cell, it retains the same channel. Thus, unlike in sectoring, a handoff is not required at the MSC when the mobile

travels between zones within the cell. The channels are re used in co channel cells in a normal fashion.

158. The mechanism behind electromagnetic wave propagation cannot be attributed to _____
a) Reflection
b) Diffraction
c) Scattering
d) Sectoring
View Answer
Answer: d
Explanation: The mechanisms behind electromagnetic wave propagation are diverse. They can be greatly attributed to reflection, diffraction and scattering. Due to multiple reflections from various objects, the electromagnetic waves travel along different paths of varying lengths.

159. The propagation model that estimates radio coverage of a transmitter is called _____
a) Large scale propagation model
b) Small scale propagation model
c) Fading model
d) Okumura model
View Answer
Answer: a
Explanation: Large scale propagation model are useful in estimating the radio coverage area of a transmitter. They can predict the mean signal strength for an arbitrary transmitter-receiver (T-R) separation distance. They characterize signal strength over large T-R separation distances.

160. Propagation model that characterize rapid fluctuation is called _____
a) Hata model
b) Fading model
c) Large scale propagation model
d) Okumura model
View Answer
Answer: b
Explanation: Fading models characterize the rapid fluctuations of the received signal strength over very short travel distance (a few wavelengths) or shot time durations (on the order of seconds).

161. Small scale propagation model is also known as _____
a) Fading model
b) Micro scale propagation model
c) Okumura model
d) Hata model
View Answer
Answer: a
Explanation: Small scale propagation model is also called fading model. Fading model characterize the rapid fluctuations of the received signal strength over very short distance of

a few wavelengths or short time duration. The propagation models are used to estimate the performance of wireless channels.

162. Free space propagation model is to predict _____
a) Received signal strength
b) Transmitted power
c) Gain of transmitter
d) Gain of receiver
View Answer
Answer: a
Explanation: Free space propagation model predicts the received signal strength when there is an unobstructed line of sight path between transmitter and receiver. It assumes the ideal propagation condition that the environment is empty between the transmitter and receiver.

163. Which of the following do not undergo free space propagation?
a) Satellite communication system
b) Microwave line of sight radio links
c) Wireless line of sight radio links
d) Wired telephone systems
View Answer
Answer: d
Explanation: EM signals when traveling through wireless channels experience fading effects due to various effects. But in some cases the transmission is with no obstruction and direct line of sight such as in satellite communication, microwave and wireless line of sight radio links.

164. The free space model predicts that received signal decays as a function of _____
a) Gain of transmitter antenna
b) T-R separation
c) Power of transmitter antenna
d) Effective aperture of the antenna
View Answer
Answer: b
Explanation: As with most large scale radio wave propagation models, the free space model predicts that received signal decays as a function of the T-R separation distance raised to some power. Often it is given as a function of negative square root of the distance.

165. Relation between gain and effective aperture is given by _____
a) $G=(4\pi A_e)/\lambda^2$
b) $G=(4\pi \lambda^2)/A_e$
c) $G=4\pi A_e$
d) $G=A_e/\lambda^2$
View Answer
Answer: a
Explanation: The gain of the antenna is proportional to effective aperture area. Therefore, antennas with large effective apertures are high gain antennas and have small angular beam widths. Most of their power is radiated in a narrow beam in one direction, and little in other directions.

166. Relation between wavelength and carrier frequency is _____
a) λ=c/f
b) λ=c*f
c) λ=f/c
d) λ=1/f
View Answer
Answer: a
Explanation: Wavelength is inversely proportional to carrier frequency. For electromagnetic radiation in free space, wavelength is a ratio of speed of light (c) and carrier frequency (f). Speed of light is $3*10^8$ m/s. The unit for wavelength is meters.

167. Which of the following antenna radiates power with unit gain uniformly in all directions?
a) Directional antenna
b) Dipole antenna
c) Isotropic antenna
d) Loop antenna
View Answer
Answer: c
Explanation: Isotropic antenna radiates the power with unit gain uniformly in all directions. It is an ideal antenna. From practical point of view, there is no actual isotropic antenna. But, an isotropic antenna is often used as a reference antenna for the antenna gain.

168. EIRP is abbreviated as _____
a) Effective isotropic radiated power
b) Effective isotropic radio power
c) Effective and immediate radiated power
d) Effective and immediate ratio of power
View Answer
Answer: a
Explanation: EIRP stands for Effective Isotropic Radiated Power. It is the amount of power that a theoretical isotropic antenna would emit to produce the peak power density observed in the direction of maximum antenna gain. EIRP also takes into account the losses in transmission line and connectors and includes the gain of the antenna.

169. Path loss in free space model is defined as difference of _____
a) Effective transmitted power and gain
b) Effective received power and distance between T-R
c) Gain and received power
d) Effective transmitter power and receiver power
View Answer
Answer: d
Explanation: I Path loss is defined as difference of effective transmitter power and receiver power. Free-space path loss is the loss in signal strength of an electromagnetic wave that would result from a line-of-sight path through free space, with no obstacles nearby to cause reflection or diffraction.

170. Far field region is also known as _____
a) Near field region
b) Fraunhofer region

c) Erlang region
d) Fresnel region
View Answer
Answer: b
Explanation: The far field is the region far from the antenna. In this region, the radiation pattern does not change shape with distance. Also, this region is dominated by radiated fields, with the E- and H-fields orthogonal to each other and the direction of propagation as with plane waves.

171. Fraunhofer distance is given by _____
a) 2D2/λ
b) 2D/λ
c) D/λ
d) 2D/λ2
View Answer
Answer: a
Explanation: Fraunhofer distance, also known as far field distance is inversely proportional to wavelength. It depends on the largest physical dimension of the antennal (D). This distance basically denotes the boundary between far field and near field region.

172. Which of the following is called an ideal antenna?
a) Dipole antenna
b) Directional antenna
c) Isotropic antenna
d) Loop antenna
View Answer
Answer: c
Explanation: Isotropic antenna is an ideal antenna that directs the power uniformly in all directions. It is a theoretical point source of electromagnetic. It is practically not possible. It is mainly used as a hypothetical antenna to measure the gain.

172. Which of the following mechanism do not impact propagation in mobile communication system?
a) Reflection
b) Diffraction
c) Scattering
d) Refraction
View Answer
Answer: d
Explanation: Reflection, diffraction and scattering are the three basic propagation mechanism which impact propagation in mobile communication system. Large scale propagation model and small scale fading and multipath propagation are described by the physics of reflection, diffraction and scattering.

173. What is the dimension of object as compared to wavelength of propagating wave when reflection occurs?
a) Large
b) Small
c) Same

d) Very small
View Answer
Answer: a
Explanation: Reflection occurs when a propagating electromagnetic wave impinges upon an object which has very large dimensions when compared to the wavelength of the propagation wave. Reflection occurs from the surface of the Earth and from buildings and walls.

174. When does the wave propagating from one medium to another gets partially reflection and partially transmitted?
a) Both mediums have same electrical properties
b) Both mediums have different electrical properties
c) Both mediums have same magnetic properties
d) Both mediums have different magnetic properties
View Answer
Answer: b
Explanation: When a radio wave propagating in one medium impinges upon another medium having different electrical properties. The wave is partially reflected and partially transmitted.

175. What is the case of reflection, in course of second medium being a perfect dielectric?
a) Loss of energy during absorption
b) Total energy reflected back to first medium
c) No loss of energy in absorption
d) Total energy transmitted into second medium
View Answer
Answer: c
Explanation: If the plane wave is incident on a perfect dielectric, part of the energy is transmitted into the second medium and part of the energy is reflected back into the first medium. There is no loss of energy in absorption.

176. What is the case of reflection, in course of second medium being a perfect conductor?
a) Loss of energy during absorption
b) Total energy reflected back to first medium
c) Partly transmission and reflection
d) Total energy transmitted into second medium
View Answer
Answer: b
Explanation: If the second medium is perfect conductor, then all incident energy is reflected back into the second medium. There is no loss of energy during absorption.

177. Small scale fading describes the _____ fluctuations of the amplitude, phases of a signal.
a) Rapid
b) Slow
c) Instantaneous
d) Different
View Answer

Answer: a
Explanation: Small scale fading or simply fading, is used to describe the rapid fluctuations of amplitudes, phases, or multipath delays of a radio signal over a short period of time or travel distance. It ignores the large scale path loss.

178. Fading is caused by interference.
a) True
b) False
View Answer
Answer: a
Explanation: Fading is caused by interference. It is caused by interference between two or more versions of the transmitted signal which arrive at the receiver at slightly different times.

179. Which of the following is not an effect caused by multipath in radio channel?
a) Rapid changes in signal strength
b) Random frequency modulation
c) Power of base station
d) Time dispersion
View Answer
Answer: c
Explanation: Rapid changes in signal strength over a small travel distance are caused due to multipath. It causes random frequency modulation due to varying Doppler shifts on different multipath signals. Time dispersion is also caused by multipath propagation delays.

180. In urban areas, fading occurs due to height of mobile antenna _____ than height of surrounding structure.
a) Same
b) Smaller
c) Greater
d) Very larger
View Answer
Answer: b
Explanation: In urban areas, fading occurs because height of the mobile antenna is below the height of surrounding structures. Therefore, there is no single line of sight path to the base station.

181. Fading does not occur when mobile receiver is stationary.
a) True
b) False
View Answer
Answer: b
Explanation: The received signal may fade even when the mobile receiver is stationary. It is due to the movement of surrounding objects in the radio channel. The multipath components combine vectorially at the receiver antenna and cause signal to distort or fade.

182. Scattering occurs when medium consists of objects with dimensions _____ compared to the wavelength.
a) Same
b) Small
c) Large

d) Very large
View Answer
Answer: b
Explanation: Scattering occurs when the medium through which the wave travels consists of objects with dimensions that are small compared to the wavelength. But the number of obstacles per unit volume is large.

183. Scattered waves are produced at _____
a) Rough surface
b) Shadowed region
c) Smooth surface
d) Horizon
View Answer
Answer: a
Explanation: Scattered waves are produced by rough surfaces, small objects or by other irregularities in the channel. In practice, foliage, street signs, and lamp posts induce scattering in a mobile communication system.

184. The actual received signal is _____ than what is predicted by reflection and diffraction model.
a) Weaker
b) Equal
c) Stronger
d) Very weak
View Answer
Answer: c
Explanation: The actual received signal in a mobile radio environment is often stronger than what is predicted by reflection and diffraction model alone. This is because when a radio wave incidence upon the rough surface, reflected energy is spread out in all directions.

185. Scattered energy in all directions provides _____ at a receiver.
a) Channels
b) Loss of signal
c) No energy
d) Additional radio energy
View Answer
Answer: d
Explanation: Objects such as lamp posts and trees tend to scatter energy in all directions. They provide additional radio energy at a receiver. Scattering may also refer to particle-particle collisions between molecules, atoms, electrons, photons and other particles.

186. Surface roughness are often tested using _____
a) Rayleigh criterion
b) Lawson criterion
c) Barkhausen stability criterion
d) Nyquist criterion
View Answer
Answer: a
Explanation: Rough surface is often tested using a Rayleigh criterion. It defines the critical

height of surface protuberances for a given angle of incidence. The Rayleigh criterion is the criterion for the minimum resolvable detail. The imaging process is said to be diffraction-limited when the first diffraction minimum of the image of one source point coincides with the maximum of another.

187. Multiple access schemes are used to allow _____ mobile users to share simultaneously a finite amount of radio spectrum.
a) Many
b) One
c) Two
d) Ten-Fifteen
View Answer
Answer: a
Explanation: Multiple access schemes are used to allow many mobile users to share simultaneously a finite amount of radio spectrum. The sharing of spectrum is required to achieve high capacity by simultaneously allocating the available bandwidth to multiple users.

188. The technique that makes possible the task of listening and talking in communication system is called _____
a) Simplexing
b) Duplexing
c) Modulating
d) Multiple access technique
View Answer
Answer: b
Explanation: In conventional telephone systems, it is possible to talk and listen simultaneously. This effect is called duplexing and is generally required in wireless telephone systems.

189. Frequency division duplexing provides _____ distinct bands of frequencies for _____ user.
a) Two, two
b) One, two
c) Two, one
d) Two, many
View Answer
Answer: c
Explanation: Frequency division duplexing (FDD) provides two distinct bands of frequencies for every user. In FDD, any duplex channel actually consists of two simplex channels.

190. The forward band in FDD provides traffic from the mobile to base station.
a) True
b) False
View Answer
Answer: b
Explanation: The forward band in FDD provides traffic from the base station to the mobile. The reverse band provides traffic from the mobile to the base station.

191. The frequency separation between each forward and reverse channel changes throughout the system.
a) True
b) False
View Answer
Answer: b
Explanation:The frequency separation between each forward and reverse channel is constant throughout the system. It is regardless of the particular channel being used. A device called a duplexer is used inside each subscriber unit and base station to allow simultaneous bidirectional radio transmission.

192. Frequency division multiple access (FDMA) assigns _____ channels to _____ users.
a) Individual, individual
b) Many, individual
c) Individual, many
d) Many, many
View Answer
Answer: a
Explanation: Frequency division multiple access (FDMA) assigns individual channels to individual users. Each user is allocated a unique frequency band or channel. These channels are assigned on demand to users who request service.

193. During the period of call, other users can share the same channel in FDMA.
a) True
b) False
View Answer
Answer: b
Explanation: In FDMA systems, no other user can share the same channel during the period of call. In FDD systems, the users are assigned a channel as a pair of frequencies; one is used for the forward channel while the other frequency is used for the reverse channel.

194. The FDMA channel carries _____ phone circuit at a time.
a) Ten
b) Two
c) One
d) Several
View Answer
Answer: c
Explanation: The FDMA channel carries one phone circuit at a time. Each individual band or channel is wide enough to accommodate the signal spectra of the transmissions to be propagated.

195. If the FDMA channel is not in use, it can be used by other users.
a) True
b) False
View Answer

Answer: b
Explanation: If an FDMA channel is not in use, it sits idle and cannot be used by other users to increase or share capacity. It is essentially a wasted resource.

196. The bandwidth of FDMA channel is _____
a) Wide
b) Narrow
c) Large
d) Zero
View Answer
Answer: b
Explanation: The bandwidth of FDMA channels is relatively narrow as each channel supports only one circuit per carrier. That is, FDMA is usually implemented in narrow band system.
197. TDMA systems transmit in a continuous way.
a) True
b) False
View Answer
Answer: b
Explanation: TDMA systems transmit data in a buffer and burst method. Thus, the transmission for any user is not continuous.

198. Which of the following is not true for TDMA?
a) Single carrier frequency for single user
b) Discontinuous data transmission
c) No requirement of duplexers
d) High transmission rates
View Answer
Answer: a
Explanation: TDMA share a single carrier frequency with several users, where each user makes use of non-overlapping time slots. The number of time slots per frame depends on several factors, such as modulation technique, available bandwidth etc.

199. Because of _____ transmissions in TDMA, the handoff process in _____
a) Continuous, complex
b) Continuous, simple
c) Discontinuous, complex
d) Discontinuous, simple
View Answer
Answer: d
Explanation: Because of discontinuous transmissions in TDMA, the handoff process is much simpler for a subscriber unit, since it is able to listen for other base stations during idle time slots.

200. _____ carries signalling and synchronizing commands.
a) Traffic channels
b) Control channels
c) Signalling channels

d) Forward channels
View Answer
Answer: b
Explanation: Control channels carry signalling and synchronizing commands between the base station and mobile station. Certain types of control channels are defined for just the forward or reverse link.

201. Which of the following is not a control channel of GSM?
a) BCH
b) CCCH
c) DCCH
d) TCH
View Answer
Answer: d
Explanation: There are three main control channels in the GSM system. These are the broadcast channel (BCH), the common control channel (CCCH) and the dedicated control channel (DCCH). Each control channel consists of several logical channels.

202. Which of the following is the forward control channel that is used to broadcast information?
a) BCCH
b) CCCH
c) DCCH
d) TCH
View Answer
Answer: a
Explanation: The broadcast control channel (BCCH) is a forward channel that is used to broadcast information such as cell and network identity, and operating characteristics of the cell.

203. Which of the following channel does not come under CCCH?
a) PCH
b) RACH
c) DCCH
d) AGCH
View Answer
Answer: c
Explanation: CCCH consists of three different channels. They are paging channel (PCH), which is a forward link channel, the random access channel (RACH) which is a reverse link channel, and the access grant channel (AGCH) which is a forward link channel.