Assignment Questions
Subject: Wireless Communication (EE-402-F)

Section – A

1. What is paging system? Explain.
2. Describe function of cordless telephone system.
3. Compare second and third generation networks.
4. Explain wireless local area networks.
5. Explain architecture of Bluetooth networks?
6. What is GSM? Explain the architecture of GSM.
7. What are the examples of wireless communication systems?
8. What do you mean by TDD?
9. Explain in detail 3rd generation wireless networks.
10. What are GSM standards?
11. What are the basic channels available in GSM?
12. Discuss the architecture of IEEE 802.11 WLAN. Explain the function of different layers.

Section – B

1. Explain in brief cellular system. What is cell splitting?
2. Explain various hand-off strategies.
3. What are performance criteria of cellular mobile networks?
4. What is frequency reuse concept? Explain.
5. Differentiate between analog and digital cellular system.

Section – C

1. Compare various multiple access techniques for wireless communication.
2. Compare FDMA and TDMA with their pros and cons.
3. Explain BRI and PRI services?
4. Explain with block diagram vulnerable period for a packet using ALOHA protocol.
5. Explain 5 features of TDMA over FDMA.
6. What is IDN? How ISDN works over IDN?
7. What is the method of spread spectrum allocation in cellular system?
8. How traffic routing in wireless network can be done?
9. Explain the merging of wireless N/W to PSTN.
10. What is Integrated Services Digital Network? Explain its architecture, data transfer mechanism and applications.

Section – D

1. What is intelligent cell concept? What are the applications of intelligent micro cell systems?
2. Write in detail about Packet Radio.
3. Explain in detail intelligent cell concept and its applications.
4. Explain in detail CDMA cellular radio networks.

5. What is in-building communication?
6. Explain in detail various packet radio protocols.
7. Explain applications of intelligent micro cell systems.
8. What is micro-cell? Mention some limitations of wireless networking?

Important Questions

Section – A

1. What is paging system? Explain.
2. Describe function of cordless telephone system.
3. Compare second and third generation networks.
4. Explain wireless local area networks.
5. Explain architecture of Bluetooth networks?
6. Explain short note on:
    a. Wireless LANs
    b. Bluetooth
7. What is GSM? Explain the architecture of GSM.
8. Compare various data network standards like GPRS, IS-95 and WCDMA.
9. What are the examples of wireless communication systems?
10. How many devices can be connected using Bluetooth? Mention maximum data transfer speed for the Bluetooth networks?
11. Explain 2.5G TDMA standard
12. What are the advantages and problems of forwarding mechanisms in Bluetooth networks regarding security, power saving, and network stability?
13. Explain forward and reverse channel parameters of IS-95 CDMA.
14. What are limitations of wireless networking?
15. What are the different steps involved when a mobile originates a call.
16. What do you mean by TDD?
17. What are wideband systems?
18. Explain in detail 3rd generation wireless networks.
19. Explain in detail evolution of mobile radio communication
20. Compare various wireless systems
21. What are GSM standards?
22. What are the basic channels available in GSM?
23. Discuss the architecture of IEEE 802.11 WLAN. Explain the function of different layers.
24. Write short notes on various mobile systems around the world
25. Describe wireless local loop system (WLL)
26. Compare 2G mobile communication with 3G mobile communication.
27. What is UMTS? Explain 3G TD-SCDMA
28. Between a pager, a cellular phone and a cordless phone, which device has the shortest battery life between charging? Why?
29. What is EDGE?

What are Bluetooth and PANs?

Section – B

1. What is cell splitting?
2. Explain in brief cellular system.
3. Explain various hand-off strategies.
4. What are performance criteria of cellular mobile networks?
5. What is frequency reuse concept? Explain.
6. Differentiate between analog and digital cellular system.
7. How can we improve the coverage and capacity in cellular system?
8. Explain various performance criteria for cellular mobile systems.
9. What do you understand by capacity of cellular system?
10. Explain briefly capacity of digital cellular CDMA.
11. Explain in detail spectrum allocation?
12. How many users can be supported for 0.5% blocking probability for the following no. of trunked channels in a blocked calls cleared system?
    a. 1
    b. 2
    c. 20. Assume each user generates 0.1 Erlang traffic.
13. Explain in detail performance criteria?
14. Explain briefly the operation of cellular systems.
15. If S/I ratio is 16 dB for forward channel performance, what is frequency sense factor and cluster size that should be used for maximum capacity if path loss exponent is n = 4. Assume there are 6 co-channel cells in first tier and all of them are at the same distance from mobile.
16. Explain cell splitting and sectoring.

Explain some performance enhancing proxies beneficial for wireless and mobile internet access.

Section – C

1. Compare various multiple access techniques for wireless communication.
2. Compare FDMA and TDMA with their pros and cons.
3. Differentiate between FHMA and CDMA.
4. Explain BRI and PRI services?
5. Explain with block diagram vulnerable period for a packet using ALOHA protocol.
6. Explain in detail SDMA.
7. Explain short note on:
    a. TDFH
    b. DS/FHMA
8. Explain 5 features of TDMA over FDMA.
9. What is IDN? How ISDN works over IDN?
10. What is the method of spread spectrum allocation in cellular system?
11. How traffic routing in wireless network can be done?
12. What do you mean by CSMA? Explain in various types?
13. Explain various methods of traffic routing in wireless networks.
14. Explain space division multiple access.
15. Explain the merging of wireless N/W to PSTN.
16. Explain use of repeaters in mobile communication.
17. Write short notes on FHMA and CDMA
18. Write note on: TDMA. Explain the efficiency of TDMA
19. Draw and explain block diagram of ISDN.

20. What is Integrated Services Digital Network? Explain its architecture, data transfer mechanism and applications.

Section – D

1. What is intelligent cell concept?
2. What are the applications of intelligent micro cell systems?
3. Write in detail about Packet Radio.
4. Explain in detail intelligent cell concept and its applications.
5. Explain in detail CDMA cellular radio networks.
6. What is in-building communication?
7. Write short note on:
   a. CDMA cellular network
   b. Intelligent Networks
8. Discuss enhancements in TCP for wireless networks. What are the different characteristics that have been considered for 2.5/3G networks?
9. Explain the following terms:
   a. Controls channels
   b. MSC
   c. Page
10. Explain reference model of mobile radio system.
11. What is Novel Micro cell zone concept?
12. Explain in detail various packet radio protocols.
13. Explain advanced intelligent networks?
14. Explain applications of intelligent micro cell systems.
15. Write a short note on in-building communication.
16. Explain the process of making a mobile call.
17. What is micro-cell? Mention some limitations of wireless networking?
18. Explain the working of mobile radio network with the help of a reference model.
19. Write short notes on:
   a. Microcell model
   b. PCS model

MULTPLE CHOICE QUESTIONS

Section A

1. Cordless telephone was introduced in the year_____
   (A) 1988 (B) 1983 (C) 1984 (D) 1994

2. _____ is a channel that allows for simultaneous transmission in both directions
   (A) Full duplex (B) Half duplex (C) Duplex (D) Simplex

3. The two directions, mobile station to base station and vice versa are separated using different frequencies, called
   (A) Frequency Division Simplex. (B) Frequency Division Duplex.
   (C) Frequency Division Full Duplex. (D) Frequency Division Full Simplex.

4. The internet is the network for global _____ communications.
   (A) dual (B) distribution (C) digital (D) data

5. WWAN stands for _____ WAN.
   (A) wireless (B) world (C) wideband (D) wired

6. _____refers to a user who has access to the same or similar telecommunication services at different places
   (A) User mobility (B) Device portability
   (C) User portability (D) Device mobility

7. Expansion for PDA is _____
   (A) personal digital access (B) personal data access
   (C) personal digital assistant (D) personal data assistant

8. _____ is high – performance digital ISDN switches
   (A) BSC (B) MSC (C) PSC (D) NSC

9. BTS stands for _____
   (A) Base transceiver station (B) Base transport systems
   (C) Base term station (D) Base task system

10. _____ stores all static information about a user as well as his or her current location
   (A) HLR (B) VLR (C) SUMR (D) CLR

11. Using _____ a mobile phone can be connected to a PDA or laptop.
   (A) wired (B) wireless piconets (C) wireless WAN (D) wireless MAN

12. Light is an electromagnetic wave similar to a radio signal with a frequency _____
   (A) very much slower than frequency of a radio signal (B) very much higher than frequency of a radio signal

(C) identical to the frequency of a radio signal (D) very similar to the frequency of a radio signal

13. In which year GSM was founded?
(A) 1982 (B) 1981 (C) 1992 (D) 1980

14. Expansion for GSM is _____
(A) Global system for mobile communication (B) Global signal for mobile communication
(C) Group system for mobile communication (D) Group signal for mobile communication

15. _____ is the primary goal of GSM
(A) Analogy service (B) Telephone service
(C) Radiology service (D) Digital service

16. A GSM system consists of _____ subsystems
(A) 2 (B) 3 (C) 4 (D) 5

17. _____ architecture introduces two new network elements
(A) GPRS (B) GSM (C) SGSN (D) CKSN

18. The two basic settings for WLANs are _____
(A) infrastructure based (B) adhoc based (C) infrared based (D) infrastructure and adhoc based

19. Which of the following is a disadvantage of WLAN?
(A) Flexibility (B) Design (C) Robustness (D) Proprietary solutions

20. The technology aims at so called ad-hoc piconets is called _____
(A) bluetooth technology (B) wap technology (C) ethernet technology (D) IEEE 802.11 technology

21. The bluetooth is a_____ with a very limited coverage and without the need for an infrastructure.
(A) WAN (B) LAN (C) MAN (D) WAP device

22. Bluetooth applies _____ for interference migration
(A) FHSS (B) FSS (C) FHS (D) HSS

23. A_____ is connected to the GSM public land mobile network
(A) mobile station MS (B) mode station MS (C) mobile system MS (D) mobile signal MS

25. The “heart” of the GSM system is formed by the _____
(A) MSC (B) HLR (C) VLR (D) NSS

Section B

26. The specification of air interface is done by ____ element of core protocols
(A) baseband (B) radio (C) link manager protocol (D) service discovery protocol

27. Base station covers a certain area called a _____
(A) mobile (B) system (C) signal (D) cell

28. Cells are combined in _____
(A) antennas (B) groups (C) clusters (D) channel

29. Each transmitter in cellular systems is called a _____
(A) base station (B) radio station (C) cell station (D) mobile station

30. The technical requirements for i-mode systems for voice call notification are _____
(A) i-mode java (B) smf, mfi (C) 3gpp standard (D) java

31. _____ is the segment of the market for mobile & wireless devices which are growing most rapidly
(A) Digital cellular network (B) Data cellular network (C) Data cell net (D) Digital code net

32. When a specific physical transmission channel is provided for the exclusive and continuous use of each path through a network, this is called _____
(A) packet switching (B) circuit switching (C) network switching (D) virtual switching

33. Packets can be transmitted through a packet-switched network as independent packets. This kind of transmission is known as _____.
(A) datagrams (B)virtual circuits (C) asynchronous (D) synchronous

34. An important impairment to digital signals in a communication system is the irregularities in timing caused by imperfections in clock extraction and waveform regeneration. This effect is known as _____
(A) jitter (B) aliasing (C) fading (D) attenuation

35. Data is transmitted in small portions called _____
(A) slots (B) burst (C) frame (D) interface

36. A_____ has additional connections to other fixed networks such as PSTN & ISDN
(A) gateway NSS (B) gateway MSC (C) gateway PSS (D) gateway MSS

37. Any one criterion for Wireless personal area network is_____

(A) less market potential (B) less compatibility (C) less technical feasibility (D) high technical feasibility

38. _____ is specifically adapted to the wireless domain
(A) MAC (B) CDM (C) TDM (D) FDM

39. _____ is the brain of the internet
(A) Switch (B) Router (C) Socket (D) Modem

40. _____ is a trunked radio system
(A) TETRA (B) GSM (C) UMTS (D) WLAN

41. The symbol for radio interface is _____
(A) Um (B) Vm (C) Dm
(D) Pm

42. WAP stands for _____
(A) Wireless application protocol (B) Wired application protocol
(C) Wired architecture protocol (D) Wireless architecture protocol

43. ETSI stands for _____
(A) European tele services (B) European telecommunication standards ins.00
(C) European technologies standards interface (D) European telecommunication standards interface

44. The last known locations of mobile users are stored in _____
(A) HLR (B) CLR (C) VLR (D) LEO

45. _____ is high – performance digital ISDN switches
(A) BSC (B) MSC (C) PSC (D) NSC

46. _____ searches for the destination addresses in the internet
(A) Socket (B) Switch (C) Router (D) Modem

47. The internet is the network for global _____ communications
(A) dual (B) distribution (C) digital
(D) data

48. Router uses _____ tables for forwarding the packets
(A) address (B) server (C) lookup (D) subnet

49. _____ is the brain of the internet
(A) Switch (B) Router (C) Socket (D) Modem

50. Expansion for FCA is _____
(A) Full channel allocation (B) Fixed combined allocation (C) Fixed channel allocation (D) Free channel allocation

Section C

51. CSMA means _____
(A) Carrier sense mode access (B) Carrier sense multiple access
(C) Carrier sense medium access (D) Carrier sense multi access

52. _____ is a server problem of wireless networks using CDM
(A) Hidden and Exposed Terminals (B) Near and Far Terminals
(C) Open and Close Terminals (D) First and Last terminals

53. The most primitive random access method is _____
(A) ALOHA (B) CSMA (C) Channelization (D) Token passing

54. In the _____ random-access method there is no collision
(A) ALOHA (B) CSMA/CD (C) CSMA/CA (D) Token-passing

55. In the _____ random-access method, stations do not sense the medium
(A) ALOHA (B) CSMA/CD (C) CSMA/CA
(D) Ethernet

56. When a collision is detected in a network using CSMA/CD, _____
(A) The frame is immediately resent (B) A jam signal is sent by the station
(C) The back-off value is set to 0 (D) The back-off value is decremented by 1

57. When a primary device asks a secondary device if it has data to send, this is called
(A) Polling (B) Selecting (C) Reserving (D) Backing off **Dr. Gihan NAGUIB 3**

58. If an FDMA network has eight stations, the medium bandwidth has _____ bands
(A) 1 (B) 2 (C) 8 (D) 16

59. If a TDMA network has eight stations, the medium bandwidth has _____bands
(A)1 (B)2 (C) 8 (D) 16

60. If a CDMA network has eight stations, the medium bandwidth has _____ bands
(A) 1 (B)2 (C) 8 (D) 16

61. The type of access used in GSM technology is _____
(A) FDMA/TDMA (B) CDMA (C) OFDMA (D) PDMA

62. The type of Access technology which can enhances the battery life is?
(A) FDMA (B) CDMA (C) FDMA/TDMA (D) ALL

63. The type of access used in narrow band analog radio system
(A) FDMA (B) CDMA (C) FDMA/TDMA (D) ALL

64. CDMA technology is times efficient than TDMA
(A) 30 (B) 40 (C) 50 (D) 90

65. FDMA technology efficiency reduced because of
(A) guard bands (B) adjust channels (C) spectrum (D) none of the above

66. The efficiency of cellular modulation techniques depends up on
(A) power signal (B) bandwidth (C) channel capacity (D) all of the above

67. --------- transmits each signal on a different frequency
(A) TDMA (B) FDMA (C) TDM (D) CDMA

68. ---------- allows any transmitter to transmit in any frequency and at any time
(A) TDMA (B) CDMA (C) FDM (D) FDMA

69. The process of handling the signal of from the old channel to the new channel is called
(A) Transfer (B) Modification (C) Change (D) Handoff

70. SCH (synchronization channel) carries
(A) TDMA frame number (B) BSIC (Base Station Identity Code)
(C) Both 1 & 2 (D) None of the above

71. BCCH is always transmitted on full power and it
(A) is never frequency hopped (B) is always frequency hopped
(C) is used to synchronize (D) None of the above

72. Which of this is used in down-link direction for sending paging message to MS whenever there is incoming call
(A) RACH (B) PCH (C) BCCH (D) FCCH

73. RACH (Random Access Channel) is
(A) an up-link channel (B) a down-link channel (C) Both way channel (D) None of the above

74. The following are used to isolate channels from adjacent-channel interference
(A) guard bands (B) spectrum (C) adjacent channels (D) none of the above

75. ———technology has the longer handset battery life
(A) TDMA (B) FDMA/TDMA (C) CDMA (D) FDMA

Section D

76. What is the basic service unit of cellular telephony?
(A) location area (B) cell (C) PLMN service area (D) MSC/VLR service area

77. The first cellular systems were _____
(A)analog (B) digital (C) semi analog (D) None of the above

78. The location area is the area in which a _____ can be paged
(A) subscriber (B) BTS (C) tower (D) None of the above

79. The _____ is the node that provides intelligent network services
(A) message center (MXE) (B) mobile service node (MSN) (C) SMSC (D) AUC

80. The PLMN service area is an area served by _____network operator
(A) one (B) four (C) ten (D) various

81. The _____ is a node that provides integrated voice, fax, and data messaging
(A) AUC (B) GMSC (C) MXE (D) MSN

82. Why is a digital network preferred over an analogue one?
(A) It is newer (B) It is smaller
(C) It has lower power consumption (D) It has higher capacity for the same bandwidth

83. Objective of WAP forum is to _____
(A) provide simplicity (B) provide diverse internet content
(C) provide private internet access (D) provide wired network access

84. Bluetooth includes _____ channels
(A) 45 (B) 50 (C) 69 (D) 79

85. Bluetooth applies _____ for separation of piconets
(A) CDMA (B) FH-CDMA (C) BH-CDMA (D) FH-BH

86. _____ adopted the standard DECT for digital cordless telephony
(A) ETSI (B) ETSS (C) ETS1 (D) ETS2

87. A useful service for very simple message transfer is the _____
(A) short message service (B) short mail service

(C) short medium service (D) short mode service

88. _____ is a database for all IMEIs
(A) FIR (B) PIR (C) SIR (D) EIR

89. GSM uses a TCH to transmit _____
(A) data (B) number (C) user data (D) channel

90. The only important number for a user of GSM is the _____
(A) phone number (B) location number (C) identify number (D) security number

91. _____ stores all static information about a user as well as his or her current location
(A) HLR (B) VLR (C) SUMR (D) CLR

92. Using _____ a mobile phone can be connected to a PDA or laptop
(A) wired (B) wireless piconets (C) wireless WAN (D) wireless MAN

93. RTS stands for _____
(A) Request to send (B) Request to simple (C) Reply to send (D) Reply to single

94. A_____ has additional connections to other fixed networks such as PSTN & ISDN
(A) gateway NSS (B) gateway MSC (C) gateway PSS (D) gateway MSS

95. The imode service was introduced in _____
(A) China (B) Europe (C) Japan (D) India

96. The groups of piconets are called as _____
(A) piconet groups (B) master groups (C) scatter (D) scatternet

97. DHCP stands for _____host configuration protocol
(A) dynamic (B) direct (C) digital (D) data

98. Mobile IP has to be integrated into existing _____
(A) OS (B) MAC (C) physical layer (D) datalink layer

99. Mobile IP has to remain _____ with all lower layers
(A) visible (B) closed (C) open (D) compatible

100. FA stands for _____ in RFC 3344
(A) frequency amplitude (B) fully authenticated (C) foreign agent (D) fast allocator