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

Section – A

1. What is paging system? Explain.
2. Describe function of cordless telephone system.
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?
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.
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.
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?
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?
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.
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
MULTIPLE 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

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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 to single  (C) Reply to send  (D) Reply

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