WIRELESS COMMUNICATION
ASSIGNMENT QUESTIONS

1 Explain in detail about paging system.
2 Describe in detail function of cordless telephone system.
3 Compare and contrast second and third generation networks.
4 Explain the architecture of wireless local area networks.
5 Explain the architecture of Bluetooth networks.
6 What is GSM? Explain the architecture of GSM.
7 Discuss in detail the challenges in wireless communication systems.
8 Explain in detail 3rd generation wireless networks.
9 What are the basic channels available in GSM? Explain each channel in detail.
10 Summarize the concept of FDD & TDD.
11 Discuss the architecture of IEEE 802.11 WLAN. Explain the function of different layers.
12 Elaborate the performance criteria of cellular mobile networks.
13 Distinguish between analog and digital cellular system.
14 Compare various multiple access techniques for wireless communication.
15 Compare FDMA and TDMA with their pros and cons.
16 Explain BRI and PRI services.
17 With neat sketch explain vulnerable period for a packet using ALOHA protocol.
18 What is IDN? How ISDN works over IDN?
19 Deduce the method of spread spectrum allocation in cellular system.
20 Explain the merging of wireless N/W to PSTN.
21 What is Integrated Services Digital Network? Explain its architecture, data transfer mechanism and applications.
22 What is meant by intelligent cell concept? What are the applications of intelligent micro cell systems?
23 Write in detail about Packet Radio.
24 Explain in detail CDMA cellular radio networks.
25 Outline the concept of in-building communication.
26 Explain in detail various packet radio protocols.
27 Point out the applications of intelligent micro cell systems.
28 What is micro-cell? Mention some limitations of wireless networking.
29 Explain short notes on:
      a. Wireless LANs
      b. Bluetooth
30 Compare various data network standards like GPRS, IS-95 and WCDMA.
31 How many devices can be connected using Bluetooth? Examine maximum data transfer speed for the Bluetooth networks.
32 Explain forward and reverse channel parameters of IS-95 CDMA.
33 What are the different steps involved when a mobile originates a call.
34 Explain in detail evolution of mobile radio communication
35 Describe wireless local loop system (WLL).
36 What is UMTS? Explain 3G TD-SCDMA
37 Between a pager, a cellular phone and a cordless phone, which device has the shortest battery life between charging? Why? Justify your answer.
38 What are Bluetooth and PANs? Elaborate the concept of Bluetooth and PANs.
39 Discuss in detail about EDGE.
40 How can we improve the coverage and capacity in cellular system?

41 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.

42 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.

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

44 Explain short note on:

      a. TDFH
      b. DS/FHMA

45 Explain in detail SDMA.

46 What do you mean by CSMA? Explain in various types?

47 Explain use of repeaters in mobile communication.

48 Draw and explain block diagram of ISDN.

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

50 Write short note on:
      a. CDMA cellular network
      b. Intelligent Networks

51 Discuss enhancements in TCP for wireless networks. What are the different characteristics that have been considered for 2.5/3G networks?

52 Explain the following terms:
      a. Controls channels
      b. MSC
      c. Page

53 Explain reference model of mobile radio system.

54 Explain the process of making a mobile call.

55 Write short notes on:
      a. Microcell model
      b. PCS model

56 Explain advanced intelligent networks?

57 Explain the working of mobile radio network with the help of a reference model.

58 Write short notes on FHMA and CDMA

59 Explain various methods of traffic routing in wireless networks.

60 Explain space division multiple access.

61 Write short notes on various mobile systems around the world

62 What are wideband systems?

63 What are the advantages and problems of forwarding mechanisms in Bluetooth networks regarding security, power saving, and network stability?

64 Explain 2.5G TDMA standard

65 What are the examples of wireless communication systems?

66 Explain in detail various packet radio protocols.

67 How traffic routing in wireless network can be done?

68 Explain various hand-off strategies.

69 Explain in brief cellular system. What is cell splitting?

Subject Handler   **HOD**

V.S.B. ENGINEERING COLLEGE, KARUR
Department of Electronics and Communication Engineering
Academic Year: 2018 - 2019 (EVEN Semester)

WIRELESS NETWORKS
ASSIGNMENT QUESTIONS

1	What is paging system? Explain.
2	Describe function of cordless telephone system.
3	Explain spread spectrum in telecommunications
4	Explain third generation networks.
5	What is GSM? Explain the architecture of GSM.
6	What are the examples of wireless communication systems? Explain?
7	What do you mean by GPRS? Explain
8	What are GSM standards? Explain?
9	What are the basic channels available in GSM? Explain?
10	Explain in brief cellular system. What is cell splitting?
11	Explain various hand-off strategies.
12	What are performance criteria of cellular mobile networks?
13	What is frequency reuse concept? Explain
14	Differentiate between analog and digital cellular system.
15	Compare various multiple access techniques for wireless Networks.
16	Compare FDMA and TDMA with their pros and cons.
17	Explain BRI and PRI services?
18	Explain with block diagram vulnerable period for a packet using ALOHA protocol.
19	Explain 5 features of TDMA over FDMA.
20	What is IDN? How ISDN works over IDN?
21	What is the method of spread spectrum allocation in cellular system? Explain?
22	How traffic routing in wireless network can be done?
23	Explain the merging of wireless N/W to PSTN.
24	What is Integrated Services Digital Network? Explain its architecture, data transfer mechanism and applications.
25	Write in detail about Packet Radio.
26	What is intelligent cell concept? What are the applications of intelligent micro cell systems?
27	Explain in detail intelligent cell concept and its applications.
28	Explain in detail CDMA cellular radio networks.
29	What is in-building communication? Explain?
30	Explain in detail various packet radio protocols.
31	Explain applications of intelligent micro cell systems.
32	What is micro-cell? Mention some limitations of wireless networking
33	What is DNS? How ISDN works over DNS?
34	What is the method of spread spectrum allocation in cellular system? Explain?
35	Define wireless model. Also explain the techniques used for increasing in performance of wireless communication
36	How modulation is carried out in wireless communication system.
37	Discuss the fixed wireless access system in detail.
38	Study the model analog and digital data transmission techniques used in wireless communication.
39	Write a detailed explanation of advanced mobile phone system, Nordic mobile telephony, D-AMPS and GSM.
40	Describe the techniques used for data delivery and various operations of data.
41	Study the recent advances in satellite system and then discuss the various issues and challenges of satellite system.

42	Study the model analog and digital data transmission techniques used in wireless communication.
43	Study the latest developments in wireless local area network.
44	Describe the architecture of wireless mobility based problems in detail.
45	Explain the wireless local loop subscriber terminals.
46	Explain wireless local loop interface to PSTN.
47	Explain the Medium access control layer.
48	Explain second generation networks.
49	Explain about mobile subscriber units and it functionalities
50	Explain detail about OFDM multicarrier modulation applications.
51	Explain detail about CDMA application.
52	Explain I detail about home location register database.
53	State mobile communication principles and explain about digital systems.
54	Explain detail about gateway and its applications.
55	Explain the concept of Controls channels in wireless network.
56	Explain reference model of mobile radio system.
57	What is Novel Micro cell zone concept?
58	Write short notes on: a. Microcell model b. PCS mod
59	Explain RACH.
60	Explain the process of making a mobile call.
61	Explain about Advanced Intelligent Network.
62	Explain about BTS.
63	Describe about MSC.
64	Explain about wideband systems.
65	Explain the concept of SDMA.
66	Draw and explain block diagram of ISDN.
67	Explain about PDA.
68	Explain the working principle of cordless telephone.
69	Describe about wireless application protocol.

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ADHOC AND SENSOR NETWORKS
ASSIGNMENT QUESTION

1   Channel quality estimation can be done both at the sender and the receiver. Which is more advantageous? Why?

2   Explain the back–off calculation mechanism used in DWOP.Is it guaranteed to be accurate at all times? If not explain why?

3   What is meant by the carrier sensing zone of a transmission? Does it have any effect on the performance of a MAC protocol?

4   Channel quality estimation can be done both at the sender and the receiver. Which is more advantageous? Why?

5   Give application scenarios where contentionbased,reservation based and packet scheduling based MAC protocols can be used

6   Link level broadcast capability is assumed in many of the multicast routing protocols.

7   Sometimes AMRIS may not exhibit high packet delivery ratio even when all modes exhibit Mobility confined to a small region. Why?

8   The CAMP protocol has been inspired from CBT.But it is more efficient compared to CBT.Give the reason behind this.

9   Discuss the effects of multiple breaks on a signal path at the TCP-F sender

10   What additional state information is to be maintained at the FP in TCP-F?

11   Explain how security portioning in ad hoc wireless networks differs from that in Infrastructure based networks?

12   Why is it not advisable to use natural language passwords directly for cryptographic Algorithm?

13   Mention one advantage and disadvantage of using LQ and REPLY for finding partial paths in TCP-Bus

14   What is the advantage of a clustered architecture over a layered architecture in a sensor network?

15   Consider the third iteration of LEACH protocol. If the desired number of nodes per cluster in What is the threshold calculated for a node during its random number generation

16   What are public key cryptographic solutions not suitable for the security of the sensor networks

17   How is authenticated broadcast provided by µ TESLA?

18   What are the limitations of the IEEE 802.11 MAC protocol that prevent it from supporting QOS traffic?

19   Compare and contrast the hybrid co coordinator of the IEEE 802.11 MAC protocol in terms of SIFS and slot time

20   What are the advantages of having transmission opportunities (TXOPs) in the IEEE 802.11e
 MAC protocol

21   Compare and contrast the IEEE 802.11 e MAC protocol with DBASE protocol

22   Explain the scheduling table update mechanism in distributed priority scheduling.

23   What is meant by OLSR and explain about OLSR routing protocol

24   Describe how the packets are transmitted in multiple access collision avoidance protocol.

25   Explain the scheduling table update mechanism in distributed priority scheduling.

26   High frequency X-Rays and Gamma rays are not normally used for wireless communication. Explain why?

27   Which modulation mechanism is better, amplitude modulation or frequency modulation? Give reason to support your software

28   Calculate the maximum achievable data rate over 9 khz channel whose signal to noise ratio is 20db?

29   Why is a minimum frame length required in CSMA /CD LANs that follow the IEEE 802.3 standard?

30   Find the expressions for received power using ground reflection model.

31   How mobility can be supported in today's internet?

32   Compare the pros and cons of using scheduling based MAC protocols over reservation based MAC protocols.

33   How does the packet queuing mechanism of of MACA differ from that of MACAAW? Which One of them is better? Why?

34   Which protocol is more bandwidth efficient, RTMAC or MACA /PR? Explain

35   List the design challenges of adhoc and sensor networks

36   List the applications of adhoc and sensor networks

37   What are the major issues that are taken into consideration for designing a MAC protocol? Explain them in detail?

38   Explain in detail about reactive routing protocols or on demand routing protocols?

39   Explain the issues and characteristics in designing a routing protocol for adhoc wireless network?

40   Explain the issues and design goals in designing a transport layer protocol for adhoc

41   Explain in detail about reactive routing protocols or on demand routing protocols?

42   Explain in detail about proactive or table driven routing protocols in detail?

43   Elaborate in detail about the classification of transport layer solutions?

44   Compare the various TCP solutions for adhoc wireless networks?

45   How the data dissemination is performed in the sensor networks? Explain in detail

46   Describe hybrid TDMA/FDMA and CSMA based MAC protocols in detail.

47   What is the purpose of MAC layer? Explain the protocols of MAC.

48   Describe hybrid TDMA/FDMA and CSMA based MAC protocols in detail

49   What is Localization? Explain the ways of localization.

50   Explain the contention based protocols with scheduling and reservation in detail.

51   List and explain the issues in designing a MAC protocol for ad hoc wireless networks. .

52   Illustrate various steps involved in five phase reservation protocol with its frame format.

53   How is scheduling mechanism achieved in distributed wireless ordering protocol?

54   Explain in detail. How are Information symmetry and perceived collisions handled?

55   What are the advantages of reservation based MAC protocol over contention based MAC Protocol?

56   Explain the types of ad hoc network routing protocols based on routing information update mechanism.

57   Classify and explain adhoc wireless network based on routing topology.

58   Explain the scheduling table updates mechanism in distributed priority scheduling.

59   Describe how the packets are transmitted in multiple access collision avoidance protocol.

60   Explain the types of ad hoc network routing protocols based on routing information update mechanism.

61   Explain in detail about aggregation as an optimization problem.

62   What is meant by OLSR and explain about OLSR routing protocol

63   Write short notes on design factor of transport protocol?

64   What are the disadvantages of the binary exponential back off mechanism used in MACA? How are they overcome in MACAW?

65   AMRIS may to exhibit high packet delivery ratio even when all nodes restrict their mobility to a small region. Why?

66   Give the difference between Ad hoc on demand Distance vector routing protocol (AODV) and dynamic sequence routing protocol (DSRP)

67   Mention any four qualities of service metrics that are used to evaluate the performance of the network?

68   Explain the types of ad hoc network routing protocols based on routing information update mechanism

69   Explain the major challenges that a routing protocol designed for adhoc wireless networks face.

Prepared by: Approved by:
Date: Date:

DATA CONVERTERS

ASSIGNMENT QUESTIONS

1. What is Sampling and specify the Spectral properties of sampled signals, Oversampling and its implications on anti-alias filter design.
2. Explain about Dynamic Element Matching occur in Data Weighted Averaging.
3. Compare Binary vs Thermometer DACs and Current Steering DACs. Give justification.
4. Finding Loop filter Coefficients in Higher Order CTDSMs.
5. Elaborate Signal Dependent Stability of DSMs and describe Function Method.
6. Explain CTDSM basics and time-scaling of CTDSMs.
7. What are the effect of DAC element mismatch and Dynamic Element Matching (Randomization).
8. Specify the Effect of opamp non-idealities finite gain bandwidth and the effect of ADC and DAC non-idealities.
9. How do you determine the excess Loop Delay in CTDSMs
10. Estimate the Maximum Stable Amplitude from simulation, Computation of in-band SNR and the details of Window revisited.
11. If the input bias current of an op amp, used as the output summer in a 10-bit DAC, is to be no more than
    that equivalent to LSB, what is the maximum current required to flow in *Rf* for an op amp whose bias
    Current is as great as 0.5 μA?
12. Explain what aliasing is, how it happens, and what may be done to prevent it from happening to an ADC circuit
13. Analyze the maximum Stable Amplitude of DSMs and Relation to Out of Band Gain. How to design Systematic NTF.
14. Does the system have multiple channels? Should the reference be internal or external? What are the drive amplifier requirements? What are the digital interface requirements? What type of digital output format is required? What are the timing conditions?
15. What are the inherent anti-aliasing property of CTDSMs.
16. How do your relate Systematic NTF Design and the Bode Sensitivity Integral and its Implications on NTF Design.
17. Determine the required sampling frequency f_s if the maximum signal frequency is 16 kHz.
18. Suppose an analog-digital converter inputs a voltage ranging from 0 to 5 volts DC and converts the magnitude of that voltage into an 8-bit binary number. How many discrete "steps" are there in the output as the converter circuit resolves the input voltage from one end of its range (0 volts) to the other (5 volts)? How much voltage does each of these steps represent?
19. Determine the maximum input voltage offset of comparators in parallel converter according to problem 3.

20	What is the required level of system accuracy? How many bits of resolution are required? What is the nature of the analog input signal? How fast must the converter operate (conversion speed)? What are the environmental conditions? Is a track-and-hold circuit required?
21	Effect of Clock jitter in CTDSMs.
22	Dynamic Range Scaling of the Loop Filter.
23	Stability in DSMs (continued).
24	Introduction to Continuous-time Delta Sigma Modulators (CTDSM).
25	Time-constant changes in CTDSMs, Influence of opamp nonidealities.
26	Determine the output voltage of a multiplying DAC (inverting), who's VREF = 10 V, a binary word is 10001001
27	Current Cell Design in a Current Steering DAC.
28	Motivation to use a Preamp, Preamp Offset Correction (Autozeroing).
29	Autozeroing a Differential Preamp, Subtracting References from the Input.
30	D/A Converter Basics, INL/DNL, DAC Spectra and Pulse Shapes.
31	Binary Weighted versus Thermometer DACs.
32	Current Steering DACs (contd) .
33	Current Cell Design (contd), Layout Considerations in Current Steering DACs.
34	Oversampling with Noise Shaping, Signal and Noise Transfer Functions, First and Second Order Delta-Sigma Converters.
35	Oversampled Approaches to Data Convresion, Benefits of Oversampling
36	Transistor Level Preamp Design.
37	Necessity of an up-front sample and hold for good dynamic performance. Timing issues in a flash ADC.
38	Bubble Correction Logic in a Flash ADC, Comparator Metastability, Case Study.(VERY POOR AUDIO QUALITY !)
39	NRZ vs RZ DACs, DAC Architectures.
40	Flash ADC Case Study (Continued).
41	An analog signal in the range 0 to +10 V is to be converted to an 8-bit digital signal. What is the resolution of the conversion in volts? What is the digital representation of an input of 6 V? What is the representation of an input of 6.2 V? What is the error made in the quantization of 6.2 V in absolute terms and as a percentage of the input? As a percentage of full scale? What is the largest possible quantization error as a percentage of full scale?
42	Explain about Regenerative Latch and their advantages.
43	Explain FFT Leakage and the Rectangular Window.
44	How Coupling Capacitor Considerations occur in an Auto zeroed Preamp.
45	Explain ADC Terminology, Offset and Gain Error, and Differential Nonlinearity (DNL).
46	What is Quantization Noise Spectrum, SFDR and Flash A/D Converter Basics.
47	How do your relate Flash A/D Converter and the Regenerative Latch.
48	Specify the operations of Fully Differential Operation.
49	Explain the terms Spectral Windows, the Blackman Window and Switch Capacitor Amplifiers
50	Compare Switch Capacitor Circuits and Parasitic Insensitive SC Amplifiers
51	Elaborate Integral Nonlinearity (INL), Dynamic Characterization of ADCs, SQNR and Quantization Noise Spectrum.
52	Explain about Fully Differential SC-circuits, the "Flip-Around" Sample and Hold, DC Negative Feedback in SC Circuits.
53	How Fully-differential circuit works and their operation and also give the relation with common-mode feedback.