M.E. EXTC CBGS sem II M- 2014

Sub:- Network security.

QP Code : BB-12049

(3 Hours) [Total Marks : 80

	N.B. 1) Question No.1 is compulsory 2) Solve four questions in all 3) Make suitable assumptions, if required, and state them clearly.	
Q.1:	a)Compare between stream cipher and block ciphers	(5)
	b)List five common network security vulnerabilities.	(5)
	c)What is an Intrusion Detection System (IDS) ?	(5)
	d)What is meant by reconnaissance of network?	(5)
Q.2:	a)The fundamental challenges in information security are confidentiality, integrity and availability or all three (CIA). Explain the importance of all the three challenges. Give one example where, 1) Confidentiality is required but not integrity. 2) Integrity is required, but not confidentiality. 3) Availability is the overriding concern.	(10)
	b) What are functions of a firewall? List and describe types of firewall.	(10)
Q. 3:	a)Why is key management essential? What is the difference between asymmetric key cryptography and symmetric key cryptography?	(10)
	b) Alice's RSA public key is (N, e) = (33, 3) and her private key is d=7. If Bob enters the message M=19 for Alice, what is the ciphertext C? Show that Alice can decrypt C to obtain M.	(10)
Q.4:	a) What is the role of a 'trusted certificate' in message authentication? Explain how it is useful in e-commerce?	(10)
	b) Describe the term "network attack"? Explain any four methods of attack that present opportunities to compromise the information on the network.	(10)
Q.5:	a) Write a note on enterprise wide network design and vulnerabilities.	(10)
	b) What is Telecommunication Regulations? Explain the role of TRAI.	
Q.6:	Write short notes on : a) Iris recognition system b) Ethical issues in computer society c) Computer crime d) Network security audit	(20)

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MMWCS 27/5/14.

QP Code : BB-12025

(3 Hours) **[Total Marks : 80**

N. B. : (1) Question **No. 1** is **compulsory**.
(2) Sove any **three** questions from the remaining.
(3) Assume suitable data if required.

1. (a) A frequency diversity microwave system operates at a RF frequency 7.4 GHz. The IF is a low-index frequency modulated subcarrier. The baseband signal is a single mastergroup (600 voice band message channel) FDM system. The antennas are 2.4 m parabolic dishes. The feeder lengths are 120 m at one station and 80 m at the other station. The reliability objective is 99.995%. The system propagates over an average terrain that has a very dry climate. The distance between stations is 40 km. The minimum carrier to noise ratio at the receiver input is 28 dB. Determine the following :– **10**
Fade margin, antenna gain, free space path loss, total branching and feeder losses, receiver i/p power (Cmin), minimum transmit power and system gain.
(Lf = 4.7 dB/100 m)
At = Ar = 43.1 dB
Lb = 3 dB

(b) Draw block diagram of SC-FDMA system and explain. **10**

2. (a) Explain operational principle of OFDM with symbol pattern. **10**
(b) Write acquisition and tracking algorithm for beam steering. **10**

3. (a) Why calibration is required in millimeter wave design? Explain most frequently used calibration method. **10**
(b) Explain spatial and temporal diversity used in millimeter wave communication. **10**

4. (a) What is polarization? Explain polarization diversity. **10**
(b) Define diversity. Describe the three most commonly used diversity schemes. **10**

5. (a) Explain adaptive channel estimation for SC-FDE wireless system. **10**
(b) In QPSK justify, the higher the value of M is, the lower power efficiency will be. Also explain bit error probability of QAM signal. **10**

6. (a) What is beam switching array? Compare them. **10**
(b) Give advantages of $\frac{\pi}{4}$ QPSK over other QPSK modulation schemes and explain its modulator with block diagram. **10**

ME - EXTC - SEM II (CBGS) May 2014

ADVANCED DIGITAL COMMUNICATION

15/5/14

QP Code : BB-12019

(3 Hours) **[Total Marks : 80**

N.B. : (1) Attempt any **four** out of **six** questions.
(2) Assume suitable data wherever required and justify the same.

1. (a) Design the error probability performance of coherent receiver for binary signaling. **10**
(b) Describe in detail process of Model based source coding. **10**

2. (a) Evaluate the performance of optimum Non-coherent receiver in Rician channels in terms of probability of error. **10**
(b) Derive waveform receiver in coloured Gaussian Noise using Time-Sampling Approach. **10**

3. (a) Describe the basic concept of Inter Symbol Interfercnce (ISI). Derive Nyquist condition for zero ISI for Band limited signals. **10**
(b) Design and Implement the M-ary non coherent detector for equiprobable, equal energy signals using matched filters. **10**

4. (a) BPSK signal is Transmitted over an AWGN channel with power spectral density No/2. The a priori probabilities of messages bit 1 and 0 are 1/3 and 2/3 respectively. **10**
(i) Design and draw the optimum MAP receiver structure.
(ii) Evaluate BER for MAP receiver in terms of Eb/No.
(b) Explain the Analogy for Spectral Broadening in Fading channels. **10**

5. (a) What do you mean by relevant and Irrelevant Noise. Explain their role in signal detection. **10**
(b) Explain in brief different methods used for combating frequency-selective fading. **10**

6. Write short notes on following :— **20**
(a) Optimum waveform receiver in White Gaussian Noise
(b) Lempel-Ziv Algorithm
(c) Time and frequency domain characteristics of duobinary signal
(d) BAYE's detection of received signal.

ME (EXTC) CBGS sem-II M/3/2014

M.M.C

QP Code : BB-12022

(3 Hours) **[Total Marks : 80**

Note: 1. All questions carry equal marks.
2. Answer any 04 questions.
3. Figures to the right indicate full marks.

1a. Explain the security features of Bluetooth (5)

b. Compare WCDMA and CDMA 2000 (5)

c. Why shape the antenna field pattern ? Explain. (5)

d. Discuss the significance of handoff procedure in CDMA (IS-95) (5)

2a. Explain with example the capacity expansion by use of frequency reuse (8)

b. Describe GSM call set up procedure in detail. (12)

3a. with a neat diagram, explain the principle working of adaptive equalizer in detail. (10)

b. Discuss intelligent cell concept and its applications. (10)

4a. Derive the expression for S/I ratio in a worst case scenario with 60° sectorization. (10)

b. Explain following terms: 1. Mobile IP and Mobility Management. (10)

2. Location management in MANET

5 a. Compare Hiper-LAN2 with IEEE 802.11a/b. Highlight advantages and disadvantages Hyper-LAN technology. (10)

b. Explain radio aspects and network architecture of IMT-2000 in detail. (10)

6 Write short notes on: (20)
a. Diversity Techniques
b. RFID Technology.

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QP Code : BB-12035

(3 Hours) **[Total Marks :80**

N.B. : (1) **Attempt** any **four** questions.
(2) Assume suitable additional data wherever necessary but justify the same.

1. (a) Define directivity. How it is different from gain of an antenna. **5**
(b) Design a rectangular microstrip antenna on a FR4 substrate with dielectric constant 4.4 and thickness 1.6 mm so as to resonate at 900 MHz. **10**
(c) How is circular polarization obtained in microstrip antenna? **5**

2. (a) Why are antenna arrays required? Derive an expression of array factor for N elements uniform linear array and an expression of Directivity of a large broadside array. **10**
(b) Design a broadside dolph-Tschebyscheff array of 8 elements with spacing d between the elements and with a minor to major lobe ratio of 26 dB. find the excitation coefficients and form the array factor. **10**

3. (a) Using sehelkunoff's method, Design a linear array with elements spaced $\lambda/_4$ apart with zeros at $\theta=0^\circ$, 90° Determine the number of elements their excitation and plot the derived battern. **10**
(b) Describe beam shaping woodward-lawson method used for antenna pattern synthesis. **10**

4. (a) What are the various techniques used to increase the bandwidth of a micrastrip antenna. Describe and differentiate between any two techniques used to increase the bandwidth of a micro strip antenna. **8**
(b) Design a broad band MSA at 3GHz with negligible variation in broadside radiation astern over at least 10% bandwidth. Mention clearly the substrate dielectric constant and thickness used in antenna, Draw the antenna structure. **7**
(c) What are the benefits and drawbacks of smart antennas? **5**

5. (a) Why are compact MSA required? Explain with the help of potential fields how is compact antenna obtained. **10**
(b) Draw and explain different compact shorted circular microstrip antennas. **5**
(c) Explain with the help of suitable diagram the concept of smart antenna beam forming. **5**

6. (a) Why does a planar monopole antenna yield a large impedance bandwidth? Derive an expression of the lower frequency corresponding to VSWR=2 of rectangular planar monopole. **10**
(b) Draw the radiation pattern of rectangular planar monopole antenna in E and H plane. **5**
(c) Write a short note on multiple input-multiple output (MIMO) system. **5**
