

ME (EXTC) II

27/5/13

Advanced Antenna Arrays

16: 1ST HALF-13 (s)-JP

Con. 8982-13.

BB-9283

(3 Hours)

[Total Marks : 80

N.B. (1) Attempt any **four** questions out of **six**.

(2) Assume **suitable** data wherever needed and justify the **same**.

1. (a) Write a short note on MIMO. 5
(b) Define the antenna parameters radiation intensity and polarization. 5
(c) Derive an expression for an N element linear array with non uniform amplitude and uniform spacing. 10
2. (a) Design a linear array with N elements spacing of λ/z so that it has radiation pattern null position at angle of 90° and 180° . 10
(b) Explain Woodward Larson antenna synthesis method. 10
3. (a) Design a rectangular microstrip antenna (RT/duroid 5880) with dielectric constant of 2.2, $h = 0.1588$ cm so as to resonate at 10 GHz. 10
(b) Explain gap coupled radiating edge rectangular MSA with example. 10
4. (a) What is the effect of Dimensions of RMSA's with a single shorting post, explain with suitable example ? 10
(b) Explain effect of various parameters of planar rectangular monopole antennas. 10
5. (a) Explain the types of smart antenna systems in detail. 10
(b) Explain hybrid coupled CMSA's with specific examples. 10
6. Write a short notes on :— 20
 - (a) Compact shorted RMSA's
 - (b) RMSA suspended in air with orthogonal ground plane.

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ME (EXTC) SEM II (CGS) May 2013

14/5/13

mobile & wireless comm

ws Feb. 2013-(e) 129

Con. 8455-13.

BB-9244

(3 Hours)

[Total Marks : 80

- N.B. :** (1) Answer any **four** questions from **six** questions.
(2) **Figures to right** indicate **full marks**.
(3) Assume **suitable** data if **necessary**.

1. (a) Explain RAKE Receiver in CDMA system. 5
(b) Explain the security aspect of Bluetooth. 5
(c) What is frequency reused concept in GSM ? 5
(d) Discuss power control in WCDMA and CDMA 2000. 5

 2. (a) How does sectoring improve S/I in cellular system ? Explain. 10
(b) A cellular service provider decides to use a TDMA scheme that can tolerate a signal to interference ratio of 16 dB in worst case. Find the optimum value of cluster size 'N' in case of :- 10
 - (i) Omni directional antenna
 - (ii) 120° sectoring and
 - (iii) 60° sectoring.Which sectoring will be better 60° or 120° ? Assume path loss exponent $n = 4$.
-
3. (a) Consider the design of a digital carrier cellular system. 10

Given :-
 $F = 900$ MHz, mobile velocity = 80 km/hour, symbol rate = 24.3 Kbps.
Determine :-

 - (i) The maximum doppler shift
 - (ii) The coherence time of the channel
 - (iii) Maximum number of symbols that can be transmitted without updating the equalizer.
- (b) Discuss IMT 2000 system in detail. 10
-
4. (a) Compare various significant Wi-Fi standards. 5
(b) Compare Hiper LAN2 with 802-11 a/b. Highlight advantages and disadvantages of Hiper LAN Technology. 5
(c) With a neat diagram, explain the principle working of Adaptive Equalizer in detail. 10
-
5. (a) Explain in detail IS-95 forward and reverse channels in detail. 10
(b) Why shape the antenna field pattern ? Explain. 5
(c) "CDMA is an interference limited system". Give proper justification to support this statement. 5
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6. Write short notes on (any two) :- 20
 - (a) RFID Technology
 - (b) Intelligent Cell Concept
 - (c) Diversity Techniques.

ME | EXTC | CCAS) II
Network Security.

31/5/13.

VT-F.H.Exam. May-13-105

Con. 9511-13.

BB-9328

(3 Hours)

[Total Marks : 80

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any **three** questions from remaining **five** questions.

(3) Assume **suitable** data if **necessary**.

1. (a) Distinguish among vulnerability, threat and control. 20
(b) Compare private key and public key methods in terms of their relative advantages and disadvantages.
(c) What do you understand by the Telecommunications Regulations ? Explain.
(d) Define the terms : Intellectual Property and Copyrights.

2. (a) Consider a program that allows consumers to order products from the web. 10
Who might want to attack the program ? What types of harm might they want to cause ? What kinds of vulnerabilities might they exploit to cause harm ?
(b) With a suitable illustration, explain the working of digital signatures. What 10
is a "message digest" ?

3. (a) Write in details about :- 10
(i) role of proxy server
(ii) reconnaissance of network.
(b) Explain how a session is established. How is a session hijacked ? 10
What are the defenses ?

4. (a) Explain the concepts of 'ciphers'. What are the various types of ciphers 10
that exist ? What is the difference between block cipher and stream cipher systems ?
(b) List and describe cryptanalytic attacks. 10

5. (a) Why is computer crime hard to prosecute. 10
(b) Write in details on :- 10
(i) Arp spoofing
(ii) Denial of service.

6. (a) Write a short note of finger print recognition. 10
(b) What do you understand by enterprise network design ? Explain in detail 10
the three tier model along with vulnerabilities.

9/15/2013
 M.E (EXTC) Sem II (R)
 Advance Digital Comm.

N.B. : (1) Attempt any **four** questions out of **six**.

(2) Assume **suitable** data wherever **required** and justify the **same**.

1. (a) Give the schematic for M-ary using optimum receiver using correlators and explain the operation for optimum detection of received message signal. **10**
- (b) A DMS has an alphabet of seven letters x_i , $i = 1, 2, \dots, 7$ with probabilities 0.35, 0.30, 0.20, 0.10, 0.04, 0.005 and 0.005. Use Huffman encoding procedure to determine the binary code for the source output also determine the efficiency of the code. **10**
2. (a) Derive the basis form equation for optimum receivers in white Gaussian Noise. Implement Binary cross correlation receiver. **10**
- (b) Design the optimum coherent receiver for Rician channels. **10**
3. (a) The Binary data 011100101 is applied to the input of a modified duobinary system. **10**
 - (i) Construct the modified duobinary coder output and the receiver output with precoder.
 - (ii) Derive and sketch the Frequency response and Impulse response of above system.
- (b) Describe the basic concept of ISI. State and prove Nyquist theorem for Band Limited Signals. **10**
4. (a) Under what condition do the following signal degradation occur slow fading, fast fading, flat fading, frequency selective fading. Explain the relationship between first two types and the last two types of fading. **10**
- (b) Explain Karhunen - Loeve (K-L) Approach to detect signal in coloured Gaussian Noise. **10**
5. (a) Evaluate the performance of optimum Non-coherent receivers in Rayleigh channels in terms of probability of error. **10**
- (b) Design optimum receiver for 16-QAM signal and calculate the probability of correct reception of entire 16-point QAM and calculate it's Mean Energy. **10**
6. Write short notes on the following :- **20**
 - (a) Model based source coding
 - (b) Methods for combating frequency selective fading
 - (c) BAYE's detection of received signal
 - (d) Union Bound for error probability.

(3 Hours)

[Total Marks : 80

N.B. : (1) Question No. 1 is compulsory.

(2) Solve any three questions from the remaining.

(3) Assume suitable data if required.

1. (a) What constitutes a short haul and long haul microwave system ? 5
 - (b) Classify millimeter wave links according to the antenna beamwidth of access point and mobile terminal. 5
 - (c) Discuss use of PN sequence as preamble in SC-FDE system. 5
 - (d) What is power efficiency of a modulation scheme ? Why is it important at millimeter wave frequencies ? 5
 2. (a) Describe protection switching arrangement. Contrast two types of protection switching arrangements. 10
 - (b) Compare millimeter wave, UWB radio and optical wireless technologies. 10
 3. (a) List performance specifications of BPSK and QPSK modulators for millimeter wave applications. Describe any four of them in detail. 10
 - (b) Compare OFDM wireless system with SC-FDE wireless system with help of block diagram. Explain dual mode operation. 10
 4. (a) What is software radio ? Explain transceiver without mixer. 10
 - (b) Explain mutual coupling effect between two antennas and thermal noise in MIMO system and also find expression for noise power. 10
 5. Discuss advanced beam steering technology with flowcharts and candidate path tables. 20
 6. (a) For HDTV application explain unequal error protection method using spatial and temporal diversity. 10
 - (b) Explain importance of axial ratio in polarization diversity. 5
 - (c) The line of sight path distance between transmitting and receiving antennas of microwave communication link is 14.4 kms. If path length of ground reflected wave between antennas is 18.6 kms and first fresnel zone occurs at a height of 200 m from line of sight path, determine the frequency of operation of microwave link. 5
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