

ME/EXTC/Sem-II (choice Base)/Modern Digital Communications
May - 17

Q.P. Code : 13564

(Time: 3 Hours)

[Total Marks: 80]

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

(2) Solve any three from remaining five questions.

Q1. Solve any Four

20

- (a) Explain Rayleigh distribution
- (b) Describe the LMS Algorithm
- (c) Comment on Lempel algorithm LM 77
- (d) Distinguish between Relevant and Irrelevant noise
- (e) Prove that $H(X, Y) \leq H(X) + H(Y)$

Q2. (a) The binary sequence 10010110010 is the input to a precoder whose output is used to modulate a duobinary transmitting filter. Construct a table showing the precoded sequence, the transmitted amplitude levels, the received signal levels and the decoded sequence. Repeat the above for modified duobinary signal pulse.

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(b) Describe the M-ary waveform receiver using whitening approach

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Q3. (a) State and prove Nyquist criteria that gives the necessary and sufficient condition for the spectrum $X(f)$ of pulse $X(t)$ that yields Zero ISI.

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(b) Explain in detail the optimum receivers in Rician channel

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Q4. (a) A DMS has an alphabet of seven letters X_i , $i=1, 2, \dots, 7$ with probabilities 0.35, 0.3, 0.2, 0.1, 0.04, 0.006 and 0.004. Use Huffman encoding procedure to determine the binary code for the source output and also determine the efficiency of the code.

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(b) Describe small scale fading in detail. Compare slow and fast fading.

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Q5. (a) Design optimum receiver for 16-QAM signal and calculate the probability of correct reception of all 16 symbols and its mean energy

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(b) Explain Binary cross correlation receivers using MAP decision theory

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Q6. Write short note on any Three

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- 1. Baye's detection of received signal
- 2. Temporal waveform coding.
- 3. Linear equalizer with MSE criterion
- 4. Imperfect Carrier Synchronization effects

May 2017.

(Ext) M.E SEM II (Choice Base)
Wireless Adhoc & Sensor Networks

Q.P. Code :09808

[Time: 3 Hours]

[Marks:80]

N.B:

Please check whether you have got the right question paper.

1. Questions No 1 is compulsory.
2. Solve any three from remaining questions.
3. Assume suitable data if required.

- Q1 a) What are the characteristics of MANET? 05
b) Give the classification of routing protocols of adhoc Network. 05
c) Explain the need of clustering of sensor nodes in wireless sensor network. 05
d) Define NANO sensor networks. 05
- Q2 a) Explain IEEE 802.22 reference architecture with suitable illustrations. With reference to this define: Relationship of devices, BS working, CPE working, BS coverage area, MA techniques. 10
b) What are the issues at the MAC layer with reference to TCP? Explain how these effects affect throughput of the network? 10
- Q3 a) Explain distance routing effect algorithm for mobility (DREAM). How distance affects in DREAM? 10
b) Compare DSDV, DSR, AODV and TORA with reference to 10
i) Route acquisition
ii) Flood for route discovery
iii) Route Failure
- Q4 a) Compare various forwarding strategies in adhoc sensor networks. 10
b) Name various tree based multicast routing protocols. Explain adhoc Multicast routing protocol utilizing increasing Id Numbers (AMRIS). 10
- Q5 a) Explain the heterogeneous architecture for integration of MANETs, WLAN and cellular networks. 10
b) Explain the working of SPIN, LEACH and Directed diffusion and compare them on the basis of optimal route, Network life time and resource awareness. 10
- Q6 Write Short Notes on Following :
a) Energy efficiency in WLAN 05
b) Bluetooth Security 05
c) Multi hop Cellular Network architecture 05
d) APTEEN 05

3 Hours

Total Marks: 80

- N.B. : (1) Attempt any four question out of Six.
(2) Figures to the right indicate full marks.
(3) Assume suitable data wherever necessary and indicate the same.

Q.1

- (a) Draw and explain in detail Single-Ended Diode Mixer. [10]
(b) Design a transistor oscillator at 4 GHz using a GaAs MESFET in a common gate configuration, with a 5 nH inductor in series with the gate to increase the stability. Choose a terminating network to match to a 50 Ω load, and an appropriate tuning network. The scattering parameters of the transistor in a common source configuration are ($Z_0 = 50 \Omega$) $S_{11}' = 2.18 \angle -35^\circ$, $S_{12}' = 1.26 \angle 18^\circ$, $S_{21}' = 2.75 \angle 96^\circ$, and $S_{22}' = 0.52 \angle -155^\circ$ [10]

Q.2

- (a) Explain Hybrid and Monolithic MIC by comparing the two MICs in the following areas Cost, size and weight, Design flexibility, Circuit tweaking and Reliability. [10]
(b) Write a short note on Field Surveys. [10]

Q.3

- (a) Draw the block diagram and explain scalar, passive, fundamental-frequency load/source pull. [10]
(b) The s parameters for the HP HFET-102-FET at 2 GHz with a bias voltage $V_{gs}=0$ are given as follows ($Z_0=50\Omega$) [10]
 $S_{11} = 0.894 \angle -60.6^\circ$
 $S_{21} = 3.122 \angle 123.6^\circ$
 $S_{12} = 0.020 \angle 62.4^\circ$
 $S_{22} = 0.781 \angle -27.6^\circ$
Determine the stability of this transistor by K- delta test and plot the stability circles on smith chart.

Q.4

- Design an amplifier to have a gain of 11 dB at 4.0 GHz. Plot constant-gain circle for $G_S = 2$ and 3 dB, and $G_I = 0$ and 1 dB. Calculate and plot the input return loss and overall amplifier gain from 3 to 5 GHz. The transistor has the following scattering parameters ($Z_0 = 50 \Omega$):

f(GHz)	S11	S12	S21	S22
3	$0.80 \angle -90^\circ$	0	$2.8 \angle 100^\circ$	$0.66 \angle -50^\circ$
4	$0.75 \angle -120^\circ$	0	$2.5 \angle 80^\circ$	$0.60 \angle -70^\circ$
5	$0.71 \angle -140^\circ$	0	$2.3 \angle 60^\circ$	$0.58 \angle -85^\circ$

Turn Over

2

Q.5

- (a) Design an lumped impedance matching network using smith chart to match a load [10]
with an impedance $Z_L = 10 + j10 \Omega$ to a 50Ω line at a frequency of 1GHz.
- (b) How is Vector Network Analyzer used to measure periodic large signal waveform [10]
with all harmonics.

Q.6

Write a short note on following

[20]

- (a) Strip lines
(b) Image Frequency in Mixers
(c) Dielectric Resonator Oscillator
(d) Microstrip lines.
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(3 Hours)

(Total Marks: 80

N.B. :

- (a) Question No.1 is compulsory.
- (b) Total 4 questions need to be solved.
- (c) Attempt any three questions from remaining five questions.
- (d) Assume suitable data wherever necessary, justify the same.

- 1.a Differentiate between Security Operations Center (SOC) and Network operations Center (NOC). [5]
- 1.b Define and Classify the following attacks as active and passive: Release of Message Contents, Masquerade and Denial of Service, Traffic Analysis and Replay. [5]
- 1.c Differentiate between Digital Signature and Digital Certificate. [5]
- 1.d Explain different forms of Intellectual Property. [5]
- 2.a Explain in brief the three widely used Virtual Private Network (VPN) Protocols. [10]
- 2.b Describe the Key generation/expansion processes of Data Encryption standard (DES) and Advanced Encryption standard (AES). [10]
- 3.a Explain how Authentication header (AH) and Encapsulating Security Payload (ESP) protocols provides authentication and/or encryption for packets at the IP level. [10]
- 3.b Explain Firewall deployment and its limitations. Also compare the various types of Firewalls. [10]
- 4.a What is 'Ethical hacking'? What do 'Ethical hackers' do and why does need for hacking ethically arise? [10]
- 4.b What is Risk management and Risk Analysis?. Explain why it is important to identify both the threat and the vulnerability when determining risk. [10]
- 5.a What is the need for Digital Forensics? Explain the different Phases in Digital Forensics. [10]
- 5.b Explain the different types Intrusion detection systems (IDS)? List out the limitations of IDS. [10]
- 6.a Explain the process of a succesful e-commerce transaction using Secure Electronic Transaction(SET) protocol [10]
- 6.b Differentiate between Biometric Identification and Biometric Authentication. Discuss any one Biometric technique in detail. [10]

E-sem-II

T5732 TO T8432T / T8050 ELECTIVE II RESEARCH METHODOLOGY

May-2017

All branch

Q.P.Code:13395

choice based

(3 hours)

[Max Marks-80]

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

(2) Assume any additional data if necessary and state it clearly

(3) Explain answers with neat sketches wherever necessary

1. a) Explain in detail the essentials of a good research report [10]
b) Explain the statistics for Data Analysis and Reporting. [10]
 2. a) Explain in brief the stages in Scientific Research process [10]
b) Briefly describe various types of research [10]
 3. a) What do you mean by 'Sample Design'? What points should be taken into consideration by a researcher in sample design for any research project? [10]
b) Formulate a research problem, taking into consideration all the aspects [10]
 4. a) Explain in details the characteristics of research [10]
b) Enumerate the different methods of collecting data giving one example each [10]
 5. a) State the objectives of research and illustrate the issues and problems in research [10]
b) Explain validity testing for research and the ethical issues faced [10]
 6. a) What do you understand by Research Design? State its types and significance [10]
b) What are the Characteristics of a good hypothesis? Explain (i) Type I and Type II errors (ii) Level of Significance (iii) variables in Hypothesis [10]
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