M.E. EXTC Sem II (CBGS) 20/11/15

Mobile & wireless Commns.

QP Code : **30087**

(3 Hours) [Total Marks : 80

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

1. (a) Explain Rake Reciver in CDMA system 5
(b) Discuss power control in WCDMA and CDMA 2000 5
(c) What is frequency Reuse concept in GSM. 5
(d) Explain security aspect of bluetooth. 5

2. (a) Explain in detail IS-95 forward and reverse channel in detail. 10
(b) Discuss IMT 2000 system in detail. 10

3. (a) A cellular service provides decide to use a TDMA Scheme that can to tolerate a signal to interference ratio of 16 dB in worst case find optimum value of cluster size N in case of 10
(i) Omni dinetional antenna
(ii) 120^0 sectoring
(iii) 60^0 sectoring
Which sectoring will be better 60^0 and 120^0 ?
Assume path loss component n =4
(b) With a neat diagram, explain the principle working of adaptive equalize in detail. 10

4. (a) Discuss intelligent cell concept and its application. 10
(b) Compare Hiper LAN2 with IEEE 802-11 a/b Highlight advantages and disadvantage 10

5. (a) Describe GSM call set up procedure in detail 10
(b) Explain following terms 10
(i) Mobile IP and Mobility Management
(ii) Location Management in MANET.

6. Write short notes on :- 20
(a) GPRS
(b) RFID Technology
(c) Diversity technique.

ME (Sem II) MMWCS 23-11-201

(CBGS)

EXTC

QP Code : **30090**

(3 Hours) [Total Marks: 80

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

1. (a) What is power efficiency of a modulation scheme? Why is it important at millimeter wave frequencies. 5
(b) What is beam switching array? 5
(c) Explain importance of axial ratio in polarization diversity. 5
(d) What is meant by coexistence with wireless backhual? 5

2. (a) Discuss a system link budget to calculate the signal power and noise figure for a cascaded system. 10
(b) Express N= KTB, input noise power in dBm and determine the noise power for an equivalent noise bandwidth of 10 MHz. 10

3. (a) The line of-sight path distance between the transmitting and receiving antennas of a microwave communication link is 14.4 km. If the path length of the ground reflected wave between the antennas is 18.6 km and the first Fresnel zone occurs at a height of 200 meters from the line- of sight path, determine the frequency of operation of the microwave link. 10
(b) What is the need for beam-steering/ beam forming? 10

4. (a) Explain the significance of Eb/ No and SNR in total probability of error equation. 10
(b) Draw and explain super heterodyning transceiver architecture. 10

5. (a) Explain spatial diversity of antenna arrays used in millimeter wave communication systems. 10
(b) How noise coupling is achieved in millimeter wave system? 10

6. Write short notes on:-
(a) Path loss using Friis equation. 5
(b) Challenges faced by 60 GHz technology. 5
(c) Path clearance and antenna heights. 5
(d) S/N and C/N ratio 5

M.E. EXTC Sem II (CBGS) 27/11/15
Nano Electronics.

QP Code : 30097

(3 Hours) [Total Marks : 80

N.B. : (1) Solve any **four** questions out of **six.**
(2) Draw **diagrams/sketches** wherever **necessary.**

1. (a) Explain the terms in detail. **10**
   (i) Injection Velocity
   (ii) Velocity Overshoot
   (b) List and discuss second order effects for MOS transisters. **10**

2. (a) Compare PDSOI and FDSOI in terms of structure, performance characteristics, and application. **10**
   (b) Justify True or False :- **10**
   "Using double gate SOI MOSFETS a better control of channel depletion region is obtained than in a "regular" SOI MOSFETs.

3. (a) List and discuss the two-approaches used in preparation of nanomaterials in nanotechnology. **10**
   (b) Explain the structure of double gate FET and its application **10**

4. (a) Explain design consideration to be made in terms of performance, power and stability while designing FINFET SRAM. **10**
   (b) Explain the need of Non-Classical MOS Transistors with the help of suitable application. **10**

5. (a) Discuss the integration issues faced with respect to high-k dielectric material. **10**
   (b) Discuss the performance of CNT in today's world with the help of application. **10**

6. Short note (**any two**) **20**
   (a) MOS Capacitor.
   (b) Hetro Structure MOSFETs.
   (c) SOI based SRAM design.

BB-Con. 8840 -15.

M.E. Sem II (CBGS) (EXTC)
Optical Networks

27/11/15

QP Code : 30103

(3 Hours) [Total Marks : 80

N.B. : (1) Solve any **four** question out of remaining **six** questions.
(2) Each question carry **equal** marks.

1. a) What was the need of developing SONET/SDH digital data transport network? Also explain the rational behind 51.84 Mbps envelope in SONET. 10
b) Discuss Add-Drop multiplexer and WDM cross connects. 10

2. a) Explain virtual tributaries, virtual container and concatenatier for SONET. 10
b) What is label distribution and binding? Explain various methods for the same. 10

3. a) Explain the concept of digital wrapper and encapulation and decapsulation with repect to optical transport network. Also explain optical network layered architecture in detail. 10
b) Explain the protection switching with respect to point to point, ring and mesh topology. 10

4. a) Discuss fault management with respect to LMP. 10
b) Explain various components used un wavelength division multiplessing. 10

5. a) Discuss internet working with IP, MPLS and optical control planes. 10
b) What is IN-BAND and OUT-OF-BAND control signalling? 10

6. Write short Note on **(any two)** 20
1. Domain and Unified service model.
2. Passive optical networks.
3. Full functionality and reduced functionality stack.

M.E. EXTC sem II (CBGS). Adv. Antenna and Arrays

27/11/15

QP Code : 30100

(3 Hours) [Total Marks : 80

N.B. (1) Question no.1 is compulsory.
(2) Attempt any three questions out of remaining five.
(3) Figures to right indicate full marks
(4) Assume suitable data wherever necessary and state it clearly

1. Attempt the following questions:
   A. Explain the significance of substrate thickness with respect to excitation of surface waves on microstrip antenna. 5
   B. Explain ferrite loop antenna and its applications. 5
   C. Explain different array tapering mechanisms in brief. 5
   D. Explain the term directivity. How it is different from gain of an antenna. 5

2. Attempt the following questions:
   A. Design a rectangular microstrip antenna on FR4 substrate with dielectric constant 4.4 and thickness of 1.6 mm so as to resonate at 900 MHz. 10
   B. Explain the different methods to obtain circularly polarized radiation from microstrip antenna. 10

3. Attempt the following questions:
   A. Design a 4 element linear Binomial tapered array for uniform inter-element spacing of half wavelength. Find the excitation amplitudes of elements and form an array factor. Plot this array factor and calculate first null beam width. 10
   B. Explain the mechanism to realize broadband response using parasitic patches in microstrip antenna. 10

4. Attempt the following questions:
   A. Design a broadside 3 element Dolph-Chebyshev array with side lobe level of 26 dB down from the main lobe. 10
   Find the excitation coefficients of elements and form an array factor.
   B. Discuss various shorted versions of rectangular and circular microstrip antennas. 10

[TURN OVER

5. Attempt the following questions:

A. Explain in detail how the planar monopole antenna yields a very high impedance bandwidth? 10

B. Explain the different parameter variation study on a RMSA. 10

6. Attempt the following questions:

A. Explain various stacked configurations of MSA. 10

B. Explain adaptive beam forming mechanism principle. 10

M.E. ERTC Sem-II (CBGS) 2-7/11/15

ASP

QP Code : 30094

(3 hours). Total Marks: 80

NOTE:
1) Attempt any **four** questions from **Six** questions
2) Assumptions made should be clearly stated.
3) Assume any suitable data wherever required but justify the same.

5 X 4 = 20

1.
a) Explain in detail Decision feedback equaliser
b) Derive Weiner Hopf equation
c) Explain MLE and gradient error
d) Derive an expression for principle of orthogonality

2.
a) Explain forward linear prediction **10**
b) Consider an auto regressive process u(n) of order 2 described by the difference equation **10**

$$u(n) = u(n-1) - 0.5u(n-2) + v(n)$$

where v*(n)* is a white noise process of zero mean and variance 0.5

i. Find the average power of u(n) if r(0)=1.2
ii. Find the reflection coefficients K1 and K2
iii. Find the average prediction error powers P1 and P2
iv. Find the autocorrelation matrix of order=3

3.
a) Explain convergence in mean of Steepest descent algorithm **10**
b) Explain convergence in mean square error sense of LMS algorithm **10**

4.
a) Write down the weight update equation of LMS algorithm and derive the condition for μ for the LMS algorithm to converge in mean sense. **8**
b) Derive the weight update equation of RLS algorithm as **12**

$$W(n) = W(n-1) + P(n)X(n)[d(n) - X^T(n)W(n-1)]$$

Turn Over

BB-Con. 8839 -15.

5.

a) A process $x(n)$ is formed by passing white noise $v(n)$ through a filter that has a system function 8

$$H(Z) = \frac{1}{1-0.08z^{-1}-0.9z^{-2}}$$

The variance of the white noise is $\sigma_v^2 = (0.19)(0.18)$. The LMS algorithm with two coefficients is used to estimate a process $d(n)$ from $x(n)$.

i. What is the maximum value for step size μ, in order for the LMS algorithm to converge in the mean?

ii. What is the time constant of convergence.

b) Consider a Weiner filtering problem characterized as follows. The correlation matrix R of the tap input vector $\boldsymbol{u(n)}$ and the cross-correlation vector p between the tap input vector $\boldsymbol{u(n)}$ and the desired response $\boldsymbol{d(n)}$ is 4

$$\boldsymbol{R} = \begin{bmatrix} 1 & 0.5 \\ 0.5 & 1 \end{bmatrix} \qquad \boldsymbol{p} = \begin{bmatrix} 0.5 \\ 0.25 \end{bmatrix}$$

i. Evaluate the tap weights of the Weiner filter

ii. What is the minimum mean square error produced by this Weiner filter

c) With the help of a block diagram explain the basic elements of general adaptive filters 8

20

6.

a) Explain any one application of adaptive filters

b) Explain LMS based adaptive equalization and prove that

$$W(n+1) = W(n) + \mu Y^*(n)[I_n - Y^T(n)W(n)]$$

c) Explain Adaptive blind equaliser

d) Derive an Expression for Mean square error

ME. sem II (CBGS) (EXTC) 1/12/15
Cloud Computing

QP Code : **30109**

(3 Hours) [Total Marks : 80

N.B. : (1) Question No. **1** is **compulsory**.
(2) Solve any **three** of the remaining **five** questions.

1. (a) Explain Berkeley Algorithm and NTP for clock synchronization. **10**
   (b) Explain whether or not NFS is to be consider a distributed file system. **5**
   (c) Explain asyncronous rich interface. **5**

2. (a) Explain GES and google NOSQL system in detail. **10**
   (b) Explain Identity Management and Access Control-Identity management. **10**

3. (a) Compare SAAS, PAAS and IAAS and Explain benefits and limination of cloud computing. **10**
   (b) How a application is deploy over cloud ? **5**
   (c) Explain microsoft Azure. **5**

4. (a) Explain multi-scheme approach and multi-entity support for Cloud Technology. **10**
   (b) How sky computing and resource optimization is useful and implemented in cloud Technology. **10**

5. (a) Explain Virtualizatin Security Management and its threats. Suggest the solution for its threats. **10**
   (b) Write short note on :— **10**
   (i) EBS. (ii) Pit fall of Virtualization.

6. (a) Explain Chubby Lock Services. **5**
   (b) Explain Amazon S3. **5**
   (c) What are the various issues for live migration in cloud Tehcnology. **5**
   (d) Difference between PARA and full Virtulization. **5**

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BB-Con.9371-15.

M.E. EXTC Sem II (CBGS) 1/12/15.
SAN

QP Code : 30112

(3 Hours) [Total Marks:80

Note: 1. Question No.**1 is compulsory.**
2. Solve any **three** out of **five**

1 a) Explain far field and near field signals in detail. **[10]**
b) Explain the analysis of various uniform planar arrays (UPA) geometries. **[10]**

2 a) Explain in detail aliasing error due to spatial sampling of a broadband plane wave. **[10]**
b) What is the concept of Beamformation? Explain in brief about resolution of Beamforming method. **[10]**

3 a) Explain in detail array transfer (steering) vector for uniform linear array (ULA) with its limitations and design of ULA. **[10]**
b) Derive the wave equation in Cartesian co-ordinates for spatiotemporal signals. **[10]**

4 a) Explain about spatially white signal noise generated in ULA (uniform linear array) and UCA (uniform circular array). **[10]**
b) What are the effects of aliasing on spatiotemporal signals is frequency domain. **[10]**

5 a) Derive an expression for wave field in open space for both diverging and converging wavefronts. **[10]**
b) Explain minimum norm technique in detail. **[10]**

6 Write short note (**any two**): **[20]**

a) Discrete Beamforming
b) Direction vs frequency
c) Types of sensor arrays
d) Problems with temporal frequency analysis

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M.E. EXTC Sem II (CBGS) 1/12/15.

Network Security.

QP Code : **30115**

(3 Hours) [Total Marks :80

N.B. : (1) Question no. **1** is **compulsory.**
(2) Attempt any **three** questions out of remaining **five** questions.
(3) **All** questions carries **equal** marks.

1. (a) What is biometric authentication? Explain its importance w.r.t. security 5
(b) Compare between vulnerability and control 5
(c) Define and comments on Intellectual propery and copyrights 5
(d) What is risk identification? 5

2. (a) What is the role of firewall? Compare different types of firewall 10
(b) What is TCP/IP protocol flaws? Explain in brief. 10

3. (a) What is digital signature? With example explain digital signature is a "Message digest"? 10
(b) Explain steps for session established? How is a session hijacked? 10

4. (a) Explain the concept of 'Ciphers' What is the difference between block cipher and stream cipher system? 10
(b) Write in details 10
(i) ARP Spoofing
(ii) DOS

5. (a) Define enterprise network design? Explain 3 tier model along with vulnerabilities 10
(b) List the roles of Telecommunication Regulation Authority of India? (TRAI)? 10

6. (a) Write a short notes on (any three):- 20
(i) Network security audit
(ii) Ethical issues in computer society and network security
(iii) Network security testing
(iv) Iris Recognition

M.E. Extc Sem II (CBGS) 7/12/15
wavelets.

QP Code : 30106

Maximum Marks:-80

Time:- 3 hrs.

N. B.

1. Question no. **1** is **compulsory.**
2. Answer any **three** out of the remaining six questions.
3. Figures to the right indicate marks.
4. Illustrate the answers with sketches wherever required.
5. Answer to the questions should be grouped and written together
6. Use Blue/Black ball ink pen to write answers. Use of pencil should be done only to draw sketches and graphs

1 a. Give the scaling and wavelet function for any two popular wavelet functions. **5**

b. What are non stationary signals? Explain how wavelet transform is well suited than DTFT for such signals? **5**

c. Explain the difference between Short Time Fourier transform and Wavelet transform. **5**

d. Explain how wavelet can be used for image compression **5**

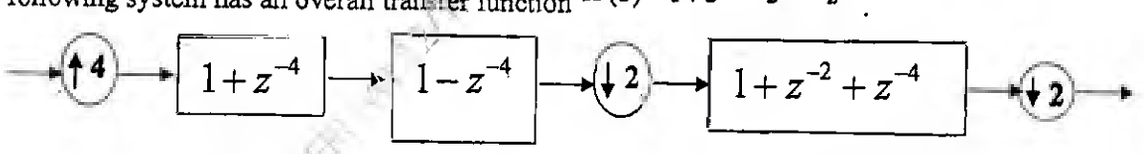
2 a. Prove the alias cancellation and perfect reconstruction condition for a 2 band quadrature filter bank in Haar MRA. **10**

b. Prove that the scaling function $\emptyset(t)$ of Haar MRA is an orthogonal basis function. Derive the generalized expression for the normalization of these basis functions. **10**

3 a. State and explain the axioms of MRA with an example. **10**

b. Explain what are biorthogonal wavelets in detail with an example. Why are they called biorthogonal? **10**

4 a. State the noble identities for upsampling and downsampling by M. and hence prove that the following system has an overall transfer function $H(z)=1+z^{-1}-z^{-3}-z^{-4}$. **10**



b. Obtain the two band filter bank using Bi orthogonal wavelets for 5/3 JPEG 2000. **10**

5 a. What is multiresolution analysis? How is it performed using the filter banks? **10**

b. Explain tiling of time frequency plane in wave packet analysis. **10**

6 Explain the Wigner-Ville distribution , give its properties , construction and application. **20**

BB-Con.9370-15.

M.E. sem II (CBGS)
CMPN Ubiquitous Computing.

1/12/15.

QP Code : 29951

(3 hours)

80 marks

Note: Q1 is compulsory

Attempt any three questions from remaining

Assume suitable data if necessary

Q1. Explain in detail design process for Education Management Ubiquitous system. Assume Suitable data for the system? (20 marks)

Q2. A) Discuss smart DEI model in detail. (10 marks)

B) Discuss in detail Human Centered Design Life Cycle Model? (10 marks)

Q3. A) Explain RFID tags in detail? (10 marks)

B) Discuss in detail service oriented computing? (10 marks)

Q4. A) List the challenges in context awareness. Explain the general architecture for context Awareness system. (10 marks)

B) Explain the role of Intelligence in UC. (10 marks)

Q5. A) Explain the importance of MTOS in UC. (10 marks)

B) Explain in detail the different dimensions of device mobility. (10 marks)

Q6. Write short note (20 marks)

a) SMART physical world environment.
b) Classroom 2000