I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
COMMUNICATION THEORY

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1 a) Discuss the method of generation of AM wave using switching modulator.   [7M]
   b) Explain vestigial sideband modulation.   [7M]

2 a) Derive an expression for figure of merit for SSB-SC system?   [7M]
   b) Discuss Pre-emphasis and de-emphasis in FM?   [7M]

3 a) Draw the block diagram of an Armstrong system of generating an FM signal and
      explain it.   [7M]
   b) Draw the block diagram of a balanced FM demodulator and explain its working. [7M]

4 a) Distinguish between instantaneous, natural and flat topped sampling techniques. [7M]
   b) State and prove sampling theorem for low pass signal.   [7M]

5 a) What is Quantization error? Derive an expression for Quantization error assuming
      Uniform Quantization?   [7M]
   b) With a neat block diagram explain how a PCM signal is generated.   [7M]

6 a) Explain ASK, FSK and PSK modulation techniques.   [7M]
   b) What is the condition for optimum receiver to demodulate the signal? Explain its
      functioning.   [7M]

7 Write a short note on
   a) ISI and its elimination.   [7M]
   b) DPCM   [7M]

8 Write a short notes on the following.   [14M]
   a) Binary Hypothesis testing   b) Bayes criterian
   c) Minimax criterian   d) Neyman-pearsion criterion

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
COMMUNICATION TECHNIQUES

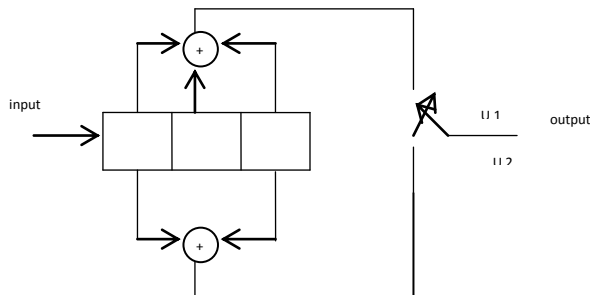Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks

1. a) For a Systematic block code the parity check equations are given by
        $p_1=m_1+m_2+m_3$, $p_2=m_2+m_3+m_4$, $p_3=m_1+m_3+m_4$, $p_4=m_1+m_2+m_4$ Where m_i are message
        digits and p_i are check digits. Find the generator matrix and the parity check matrix for
        this code. Is the vector 10011001 a code word?   [7M]
    b) Construct a systematic (7,4) cyclic code using the generator polynomial
        $g(x)=x^3+x+1$. What are the error correcting capabilities of this code? Construct the
        decoding table.   [7M]

2. a) For the convolutional encoder shown, write the connection vectors and polynominals.

        Draw the trellis diagram.   [7M]

    b) Explain in detail about soft decision decoding and hard decision decoding of linear
        block codes.   [7M]

3. a) Give comparisons and limitations of Viterbi and sequential decoding schemes.   [5M]
    b) Explain about Reed Solomon encoding and decoding. Compare binary and
        non-binary codes.   [9M]

4. a) Explain in detail the different types of signaling formats for the base band
        representation of binary data.   [7M]
    b) What is equalization? Explain in detail the operation of a transversal equalizer.   [7M]

5. a) Explain in detail about early/late-gate data synchronizer.   [7M]
    b) Discuss about data-aided synchronization and non-data aided synchronization.   [7M]

6. a) With a neat diagram explain about coarse synchronization of a FH signal.   [7M]

b) Explain in detail the generation and characteristics of PN sequences. [4M]
c) A PN sequence is generated using a feedback shift register of length m=4.The chip rate is 10^7 chips/second .Find the **i)**PN sequence length **ii)** Chip duration of this PN sequence. **iii)** PN sequence period. [3M]

7. a) Explain in detail about DS spread spectrum systems. [7M]
   b) i)What are the applications of spread spectrum techniques. [7M]
      ii)A spread-spectrum communication system has the following parameters . Information bit duration T_b =4.095ms and PN chip duration T_C=1μs. If the average probability of error is not to exceed 10^{-5} find the processing gain and jamming margin.

8. Write short notes on any four of the following [14M]
   a) Concatenated block codes.   b)   Turbo codes.
   c) BLADES system.   d)   Tapped delay filter.
   e) Structured sequences.

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
SATELLITE COMMUNICATION AND PHASED ARRAYS
Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1) a) Explain in detail about the spacecraft subsystems: AOCS, TTC&M and power systems.
                                                                                                                [10 M]
    b) A satellite at a distance of 40,000 Km from a point on the earth's surface radiates a power of 10 W from an antenna with a gain of 17dB in the direction of the observer. The satellite operates at a frequency of 11 GHz. Find the received power when the receiving antenna has a gain of 52.3 dB.   [4 M]

2) a) Discuss how rain affects the satellite UPLINK and DOWNLINK design in geostationary satellites? Explain with necessary equations.   [7M]
    b) What is a transponder? Explain its operation with a neat diagram?   [7M]

3) a) Explain CDMA in detail and Compare its advantages over FDMA and TDMA.   [10M]
    b) Discuss about Satellite switched TDMA with onboard processing   [4M]

4) a) Explain the parameters that control the design of an earth station. Explain the design procedure of an earth station.   [7M]
    b) Explain the concept of pure ALOHA in detail   [7M]

5) a) Describe about message transmission by FDMA based on M/G/1 queue   [10M]
    b) Explain about message transmission by TDMA.   [4M]

6) a) Explain how polling is accomplished in VSAT networks?   [7M]
    b) Explain about MSAT Network configuration?   [7M]

7) a) Discuss about the various factors involved in array characterization of communication systems.   [7M]
    b) Explain the system requirements for radar and communication systems?   [7M]

8) Write short notes on: [14M]
    a) Kepler's laws of motion
    b) Earth station antennas
    c) Demand access multiple access

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
DIGITAL SIGNAL PROCESSING

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1.   a) Explain the problem of linearly predicting the value of a stationary random process
          forward in time and backward in time?   [7M]
        b) Draw the model for linear estimation problem in the presence of an additive noise
          disturbance. Write down 3 special cases of estimation problem?   [4M]
        c) What is meant for Weiner filter? Explain FIR Weiner filter?   [3M]

2.   a) What is meant for Chirp signals? Evaluate and explain the chirp-Z transform algorithm
          for the DFT of an N-point data sequence x(n)?   [7M]
        b) By using the Levinson-Durbin algorithm describe the solution for the normal
           equations?   [7M]

3.   a) Explain QMF filter bank theory in detail?   [7M]
        b) Derive various DFT filter bank structures using polyphase decompositions?   [7M]

4.   a) Discuss and compare different power spectrum estimation techniques?   [7M]
        b) Write about   i) Trans multiplexer
                              ii) AR process modeling   [7M]

5.   a) Explain the linear prediction model of speech production? What are advantages of
          this model?   [4M]
        b) Explain the voice coder for the speech production and perception with a neat
           block diagram?   [5M]
        c) Write short notes on DTMF system?   [5M]

6.   a) Explain the operation sub band speech coder with a neat block diagram?   [4M]
        b) Give and explain the design and implementation of the linear filter for
           sampling rate conversion?   [5M]
        c) Write short notes on sampling rate conversion by a rational factor I/D?   [5M]

7.   a) Write down two optimization methods for designing IIR filters?   [7M]
        b) Write the comparison of optimum FIR and equalized elliptic digital filters? [7M]

8.   a) Describe the goertzel algorithm briefly?   [7M]
        b) Write short notes on Tunable IIR digital filters?   [7M]

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
OPTICAL FIBERS AND APPLICATIONS

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1)   a) Explain the difference between Step-Index and Graded Index fiber& explain
        various modes in both the fibers   [5M]
     b) Describe briefly the fabrication of various types of optical fibers with
        neat sketches.   [6M]
     c) Compute the number of modes for a fiber whose core diameter is 50μm. Assume
        that n_1=1.48 and n_2= 1.46, let λ= 0.82μm   [3M]

2)   a) Explain the operation and characteristics of Light Emitting Diode.   [7M]
     b) Describe the principle involved in LASER and explain the operation of LASER diode
        and its characteristics.   [7M]

3)   a) What is a Photo multiplier and what are the principles of Photo detection.   [7M]
     b) Explain briefly the working of various photo diodes with a neat sketch.   [7M]

4)   a) Explain in detail about Fiber optic splicing and connectors   [7M]
     b) Describe the design of Directional couplers and Star couplers.   [7M]

5)   a) With a neat block schematic explain Wavelength Division Multiplexing system [7M]
     b) Explain briefly the function of Attenuator, Circulator and Polarization controller. [7M]

6)   a) Explain briefly the analog and digital modulation formats in fiber optics   [7M]
     b) Explain the working of Optic Heterodyne Receivers.   [7M]
7)   a) Write a short note on various types of Noise in fiber optics   [7M]
     b) A system consists of an LED emitting 10mW at 0.85 μm, a fiber cable with 20dB of
     loss, and a PIN photo detector of   responsivity 0.5 A/W. The detectors dark current is 2
     nA. The load resistance is 50Ω,the receivers bandwidth is 10MHz, and its temperature is
     300K(27[0]C).The system losses, in addition to the fiber attenuation, include a 14dB
     power reduction due to source coupling and a 10-dB loss caused by various splices and
     connectors. Compute the received optic power ,the shot noise and thermal noise power,
     and the signal-to- noise ratio.   [7M]

8)   Writ a short note on the following
        a)Distribution Networks in fiber optics   [4 M]
        b)Thermal and Shot noise, signal to noise ratio.   [7M]
        c) Application of fiber optics.   [3M]

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
EMI / EMC

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1(a).List out the mechanisms in which EMI propagates from source to receiver and briefly
    explain the Electromagnetic spectrum and it's utilization.   [7M]
  (b).List out sources of EMI in detail.   [7M]

2(a).What is meant by ESD.Explain effects of lightening discharge on transmission lines.   [7M]
  (b).Draw an ESD equivalent circuit and explain Electromagnetic pulse and its impact.   [7M]

3(a).Draw an equivalent circuit of relay / switching circuit and explain the characteristics
    of Electromagnetic noise produced by switches.   [7M]
  (b).How do you explain phenomenon of crosstalk in transmission lines and list out materials
     to be used and materials to be avoided for reducing passive inter modulation.   [7M]

4(a).Compare radiated interference test facilities in detail.   [7M]
  (b).Explain the precautions to be taken in open area test site measurements.   [7M]

5(a).Explain the conducted EM noise on power supply lines and conducted EMI from equipment
    and how do you eliminate them.   [7M]
  (b).Describe different types of grounding techniques with suitable examples.   [7M]

6(a).Define shielding effectiveness and explain different methods of shielding and design
    methodologies.   [7M]
  (b).Describe characteristics of EMI filters.   [7M]

7(a).Describe the characteristics of cables, connectors and compensators in EMC design.   [7M]
  (b).Briefly discuss isolation transformers and opto isolators.   [7M]

8.   Write short notes on.   [14M]
     (a) EMC Standards   (c) Electrical surge
     (b) Electrical bonding   (d) Statistical EMI / EMC modules.

[M16 CS 1106]

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
MICROWAVE COMPONENTS AND NETWORKS

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1. a) Specify the reasons with examples why conventional transistor , IC and wire won't work at
    microwave frequencies.   [5]
  b) Write the applications of the E.M. spectrum (300 MHz-300GHz)   [3]
  c) A radar transmitter output power measured is 1000w. Express the power in terms of dBw
    and dBm.   [6]

2. a) write the principle of operation of two cavity klystron amplifier with neat diagram.   [5]
  b) Explain the velocity modulation in reflex klystron using Applegate diagram for 13/4 cycle.   [6]
  c) Reflex Klystron operates at 9GHz with beam voltage of 300V, repeller space is 20mm for

    13/4 mode. Find the maximum power when $I_B = 20$ mA.   [3]

3. a) Differentiate between linear beam tubes and M type tube with reference to the Electric and
    Magnetic fields.   [5]
  b) Explain the principle of operation of Magnetron and write the Hull cutoff condition   [9]

4. a) write the principle of operation of tunnel diode and PIN diode   [6]
  b) what are difference between fixed step and variable attenuators   [6]
  c) Input VSWR of an attenuator which is shorted at the other end is observed to be 2.5. what is
    the attenuation introduced by the attenuator?   [2]

5. a) what are the properties of scattering Matrix?   [5]
  b) Obtain the 'S' Matrix for '4-port' directional coupler?   [9]

6. a) Differentiate between the 'E' and 'H' planes of Tee junction?   [6]
  b) write the 'S' matrix for Magic Tee or Hybrid junction.   [8]

7. a) what are the advantages of MMICs?   [3]
  b) What are the basic materials used in fabrications of MMICs. Explain the substrate and
    conductor material characterized with examples.   [6]
  c) Explain the diffusion, Ion implementation and epitaxial growth methos of MMIC fabrications   [5]
8. a) Draw the experimental setup and explain the procedure for measuring the VSWR of less than 10.

  b) Explain the following with respect to directional coupler.   [7]
    i. Coupling factor
   ii. Directivity
  iii. Isolation.

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
ADVANCED MICROPROCESSORS

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks
(Note: 8086 instruction set summary table is allowed)

1 a) With the help of a block schematic diagram, Explain the architecture of 8086
   Microprocessors.   [7M]
  b) What are the different addressing modes supported by 8086. Explain each of them with
   suitable examples.   [7M]

2 a) Explain pin configuration of INTEL 8086 and describe the function of each Pin.   [7M]
  b) Draw and discuss the read and write cycle timing diagrams of 8086 in minimum mode. [7M]

3 a) Explain about the assembler directives of 8086 Microprocessor.   [7M]
  b) Find out the machine code for the following instructions.
       i)   ADC AX, BX ;   ii)   MOV BX, 5000H,   iii)   AND CX, [SI]
       iv)   Jump 2000H: 5000H ; v)CMP AX, [SI]   [7M]

4 a) Write an ALP to find out number of even and number of odd numbers from a given series
    of 16 bit hexadecimal numbers.   [7M]
  b) Write an ALP for the addition of two 3x3 matrices. The matrices are stored in the form of
    lists row wise. Store the result of addition in the third list.   [7M]

5a) Draw and discuss interrupt structure of 8086 in detail.   [7M]
  b) Explain the stack structure of 8086 in detail.   [7M]

6 a) Explain about 80186's programmable interrupt controller.   [7M]
  b) Write an ALP to generate a delay of 10 minutes using 8086 system that runs at 10 MHz
    clock.   [7M]

7 a)Describe the80386 memory system, and explain the purpose and operation of the bank
    selection signals.   [7M]
  b)Explain briefly about Pentium Processor   [7M]

8   Answer **any Four** Questions   [14M]
    a) Instruction format of 8086
    b) Internal structure of 80186 timers.
    c) Compare and contrast the 80386 and 80486 with earlier processors
    d) Special 80386 registers
    e) Detail the new instructions found with the Pentium microprocessor.

[M16 CS 1108]

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I/II M.Tech. I Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
Embedded Systems

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1. Compare features in an exemplary family chip (or core) of each of the following: Microprocessor, Microcontroller, RISC Processor, Digital Signal Processor, ASSP, Video processor & Media Processor.   [14M]
.

2. What are the special structural units in processors for digital camera systems, real digital camera systems, real-time video processing time video processing systems, speech compression systems, voice compression systems, and video games?   [14M]

3. a)What are the common structure units in most processors?   [7M]
   b) Explain about computer parallel communication between the networked I/O multiple devices using the ISA & PCI.   [7M]

4. a) Explain types of serial ports & Parallel Ports.   [4M]
   b) Explain about Synchronous Serial Input device and Serial Output device in detail.   [10M]

5. a) Explain the terms Interrupt Latency, Minimum Latency, Minimum Interrupt Latency Period.   [3M]
   b) Explain Task ISR, Short ISR with an example.   [11M]

6. a)Explain about FIPO queues for flow control on a network.   [7M]
   b)What are the Embedded Programming advantages in C++.   [7M]

7. a)Explain about programming models for event control with an example.   [7M]
   b)Write a brief description on modeling of multiprocessor system.   [7M]

8. Explain in detail about software programming in Assembly Language and in High Level Language C.   [14M]

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
RF AND MICROWAVE ENGINEERING

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1. a) What are the reasons for using RF and Microwave frequencies? List out the applications
       of RF and Microwave signals.   [3M]
    b) Using KVL and KCL derive the relationship between voltage and current in a
       transmission line at RF and Microwave frequencies.   [8M]
    c) State and explain the universal communication principle.   [3M]

2. a) Explain the differences between RF / Microwave signals and DC or low AC signals.[4M]
    b) Using and L-network, design a circuit to match a 50 Ω source resistance to an 850 Ω
       load at 50 KHz. Assume that the DC must also be transferred from the source to the load.
                                                                                             [5M]
    c) Design a resonant circuit with a loaded Q of 50 that operates between a source of 100 Ω
       and a load of 200 Ω at a frequency of 100 MHz.   [5M]

3. a) Explain how the smith chart is derived. Describe in detail two types of smith charts. [7M]
    b) Determine the standing wave pattern an a transmission line having $z_0 = (100 + i\ 100)$ Ω
       with an incident voltage of $v^+ = 1\ L$ [7M]

4. a) Explain in detail about balanced amplifier design technique   [7M]
    b) Discuss the different types of microwave power combines.   [7M]

5. a) Explain in detail about maximum gain amplifier (MGA) design.   [3M]
    b) Discuss the designs of maximum gain multistage amplifier and minimum noise
       multi stage amplifiers.   [7M]
    c) Calculate a 3 dB 90^0 branch-line hybrid coupler's impudence voltage for 50 Ω input and
       output a transmission lines.   [4M]

6. a) Explain the design consideration of amplifier and oscillator   [7M]
    b) Explain one port NR oscillator analysis.   [7M]

7. a) Explain the design procedure for transistor oscillators.   [7M]
    b) Write a brief note an generator using network   [7M]

8. Write short notes on
    a) Various methods of increasing Q in a inductor   [4M]
    b) Foster's reactance theorem.   [7M]
    c) Signal distortion in multi stage amplifier.   [4M]

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[M16 CS 1202]

I/II M.Tech. II Semester Regular Examinations

COMMUNICATION SYSTEMS

MODEL QUESTION PAPER

CELLULAR AND MOBILE COMMUNICATIONS

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks

1. a) Explain the evolution of cellular communication system with examples.   [7M]
    b) Define the term Handoff and briefly explain various types of
        handoff techniques   [7M]

2. a) What are the various methods of improving the coverage and capacity of a cellular
        system   [7M]
    b) In a total of 33mhz of bandwidth is allocated to a particular FDD cellular telephone
        system which uses two 25 KHz simplex channels to provide full duplex voice and
        control channels, compute the number of channels available per cell if a system uses
        (a) four-cell reuse, (b) seven-cell reuse, and (c) 12-cell reuse. If 1 MHz of the allocated
        spectrum is dedicated to control channels, determine an equitable distribution of control
        channels and voice channels in each cell for each of the three systems.   [7M]

3. a) Define and derive co-channel interference and system capacity in different situation and
        how you can minimize co-channel adjacent channel interference   [7M]

    b) Write about different upgrade paths developed for GSM carries.   [7M]

4. a) Explain various multiple access techniques in a cellular system   [7M]
    b) Explain forward and reverse channels in GSM.   [7M]

5. a) Write about GEO, LEO and MEO satellite and terrestrial systems.   [7M]
    b) Briefly explain the function of Rake receiver.   [7M]

6. a) Explain about ground reflecting model   [7M]
    b) Write about different types of small scale fading.   [7M]

7. a) Derive power received in free space propagation models.   [7M]
    b) Write about different outdoor propagation models.   [7M]

8. Write a short notes on
       1) Trunking and GOS   [6M]
       2) AMPS   [4M]
       3) Packet radio protocols.   [4M]

[M16 CS 1202]

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[M16 CS 1203]

I/II M.Tech. II Semester Regular Examinations

COMMUNICATION SYSTEMS

MODEL QUESTION PAPER

GLOBAL POSITIONING SYSTEM AND ITS APPLICATIONS

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks

1. a) Draw the Block diagram of GPS system Architecture and briefly explain its working
      principle.   [7M]
   b) Describe the function of a GPS receiver with block diagram   [7M]

2. a) How to determine the satellite position? Explain   [7M]
   b) Explain about the broadcast ephemeris.   [7M]

3. a) Derive the expression for removing the ionosphere delay using dual frequency
      measurements.   [7M]
   b) Derive the user position estimation using satellite position.   [7M]

4. a) What is the importance of Trilateration? With a pictorial representation show how the
      position of an object can be realized using Trilateration?   .   [7M]
   b) Describe the receiver independent exchange format   [7M]

5. a) Explain how precise positioning is obtained using carrier phase measurements.   [7M]
   b) Discuss about various propagation errors that limit the GPS range measurements. [7M]

6. a) Discuss how multi path affects the accuracy of GPS signals.   [7M]
   b) Describe the ECEF coordinate system. Also compare it with WGS – 84.   [7M]

7. a) Describe the various measurements done on L_1 and L_2 frequencies.   [7M]
   b) Describe Geodetic datum and Geocentric Co-Ordinate Systems   [7M]

8. a) Explain about the Galileo systems.   [7M]
   b) What is GAGAN? Briefly explain its working principle.   [7M]

[M16 CS 1203]

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
TELECOMMUNICATION SWITCHING AND NETWORKS

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1a) Explain various types of switching techniques for data transmission.   [10M]
 b) A circuit switch connection involves 5 switching nodes. Each node takes 2 seconds and
     0.2 seconds for establishing and releasing connection respectively. If the data transfer
     rate is 2400 bps, compute data transfer time for a message that is 300 bytes long.   [4M]

2a) Explain various types of Time division switching methods.   [7M]
 b) Derive the expression for Erlang B formulae.   [7M]

3a) What is a stored program control? What are the approaches to organize SPC and compare
     the availability figures of single and dual processor system?   [7M]
 b) Draw and explain the function of a N X N three   stage network.   [7M]

4a) What is DSL Technology? Write about different types of DSL technologies?   [7M]
 b) Explain the functional operations of SONET.   [7M]

5a) Compare the generations of Ethernet and explain various types of Ethernets?   [7M]
 b) Explain the functions of various connecting devices in LAN's.   [7M]

6a) Explain in detail the architecture of IEEE 802.11 wireless LAN.   [7M]
 b) Write about BLUETOOTH LAN technology.   [7M]

7a) Explain the network and protocol architecture of ISDN.   [7M]
 b) Write about Internetworking and various ISDN standards.   [7M]

8   Write about   [14M]
    a) Cable Modem   b)Hybrid switching   c)Broadband ISDN

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
Modeling and Simulation of Communication Systems
Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1.a) Explain about transformations of random variables?   [7M]
  b) Describe briefly about ARMA sequences?   [7M]

2.a) Explain the communication system modal?   [7M]
  b) What is necessity of channel coding? Explain about linear block codes?   [7M]

3. a) Explain about data aided and non-data aided synchronization?   [7M]
  b) What is multipath fading and explain about finite state channel models?   [7M]

4. a) Differentiate multiplexing and multiple access techniques?   [7M]
  b) Explain about RZ and NRZ waveforms with neat sketches?   [7M]

5. a) Explain the process of estimating delay and phase?   [7M]
  b) Explain about CDMA cellular radio system?   [7M]

6. a) Explain about optical modulation and demodulation?   [7M]
  b) How do you estimate average power of a wave form?   [7M]

7. a) what are performance measures of the digital systems?   [7M]
  b) Explain about Markov process?   [7M]

8. a) Explain about quasi-analytical estimation?   [7M]
  b) How do you estimate properties of particular distribution using importance sampling
     method?   [7M]

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
MODERN RADAR SYSTEMS

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1(a) What is meant by Radar cross-section and how does it influence detectability?   [7M]
  (b) State Radar range equation and discuss the influence of radar cross section on the
      range realizable.   [7M]
2(a) What is meant by "frequency agility" and how does it influence the radar Performance.[7M]
  (b) Describe the importance and functioning of monopulse radar.   [7M]

3(a) What are the main components of a "Tracking Radar".   [7M]
  (b) Two aircrafts are at the same elevation from a radar system but travelling on different glide
      paths .Explain how the two targets can be resolved and tracked.   [7M]

4(a) How is a target "acquired".   [7M]
  (b) Explain whether modulation is required for implementing surveillance radar.   [7M]

5(a) What factors determine accuracy in a Doppler radar?   [7M]
  (b) A Doppler radar works at 12GHz and uses a pulse modulator. If the pulse width is $1\,\mu$ sec,
      what is the range and velocity detectable if peak power is 500watts? Assume Suitable
      parameters for antenna and target cross section and discriminator Sensitivity.   [7M]

6(a) Describe the performance of a radar system which is useful in measuring velocity of a
      target accurately.   [7M]
  (b) What is the need for pulse compression in radar receiver.   [7M]

7(a) Briefly describe how a Stealth aircraft avoids detection by radar.   [7M]
  (b) What steps are to be taken in a defense radar system if it is known that the frequency used
      information is available to the enemy.   [7M]

8   Write short notes on the following: [14M]
      (a)Range Resolution
      (b)Pencil Beam
      (c)Electronic Counter Measure (ECM)

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
Digital Image Processing

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1) a) Explain The Fundamental Steps Involved In Digital Image Processing?   [7M]
   b) Explain Image Sampling and Quantization?   [7M]

2) a) Explain The Properties Of Hadamard and Slant Transforms?   [7M]
   b) Explain The Properties of DCT and Walsh Transforms?   [7M]

3) a) Explain Smoothing and Sharpening Of Spatial-Domain Filters.   [7M]
.   b) Explain Inverse, Weiner and Constrained least squares filtering?   [7M]

4) a) Explain about Objective and Subjective image fidelity criterion?   [7M]
   b) Explain Run length and Transform Encoding?   [7M]

5) a) Draw the Block diagram of basic Image compression System and explain.   [7M]
   b) What is the need for Image Compression? How Image Redundancies are eliminated? [7M]

6) a) Explain the Point, Line and Edge detection?   [7M]
   b) Explain Thresholding in Image segmentation?   [7M]

7) a) Explain Boundary and Simple Descriptors?   [7M]
   b) Explain Chain Codes and Shape Numbers?   [7M]

8) a) Explain Random Transforms?   [7M]
   b) Explain Convolution Projection?   [7M]

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
VLSI DESIGN

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1 (a). Describe the MOSFET operation under static conditions with respect to resistive operation, saturation region and threshold voltage.   [7M]
   (b). Draw the circuits and stick diagrams for NMOS Inverter and CMOS Inverter.   [7M]

2 (a). Describe the steps involved in CMOS operational amplifier design.   [7M]
   (b). Explain any two MOS multipliers.   [7M]

3 (a). What are the design techniques to reduce switching activity? Explain with examples. [7M]
   (b). Explain the advantages and disadvantages of different logic styles.   [7M]

4 (a). Design a single bit adder schematic with transistor-level implementation. Your design should use minimum number of transistors.   [7M]
   (b). Implement a parity generator using a static 4 input XOR gates.   [7M]

5 (a). Explain characterizing the Op-amp with respect to Input off set voltage, Output voltage swing, CMRR and Slew rate.   [7M]
   (b). What is simulation and what are the types of simulation?   [7M]

6 (a). What are the basic features of VHDL language for behavioral modeling?   [7M]
   (b). Draw NAND and NOR gates using CMOS logic and explain their operation.   [7M]

7 (a). Explain about automatic test pattern generation.   [7M]
   (b).What is meant by Channel length modulation and Velocity saturation in a MOSFET? [7M]

8 (a). What is Domino logic? Explain the optimization of Domino logic?   [7M]
   (b). Describe different memory elements.   [7M]

[M16 CS 1208]

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
Application Specific Integrated Circuits (ASIC)

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1 a) Briefly explain different types of ASICs?   [7M]
   b) Illustrate the sequence of steps to design an ASIC.   [7M]

2 a) Outline the steps involved to create CMOS IC.   [7M]
   b) Explain CMOS process design rules using neat sketches.   [7M]

3 a) Write a brief note on CMOS inverter characteristics.   [7M]
   b) Explain different types of I/O cells that are used in programmable ASICs and their
      functions.   [7M]

4 a) Explain about Schematic entry for ASICs.   [7M]
   b) Write an overview of VHDL and Verilog HDL.   [7M]

5 a) Illustrate the physical design steps for an ASIC.   [7M]
   b) Discuss goals and objectives of Floor planning.   [7M]

6 a) Write functional overview of Dynamic warp processor.   [7M]
   b) What do you mean by Technology updatability? Explain briefly.   [7M]

7 Explain Floor planning and placement steps involved in ASIC design with the help of good
   example.   [14M]

8 a) Write a short note on I/O pads.   [7M]
   b) Write a short note on Scaling of MOS circuits.   [7M]

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
Multimedia Communication Systems

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1. (a) Discuss various Multimedia information representation formats.   [7M]
   (b) Explain about Multimedia communication systems and their applications.   [7M]

2. (a) Explain the principle of ADPCM and LPC speech coding   [7M]
   (b) What do you mean by Perceptual coding & distinguish G.721, CELP, MPEG audio
       Coders?   [7M]

3. (a) With the help of a functional block diagram explain JPEG Image compression standard.
                                                                                     [7M]
   (b) Discuss scalability & other advantages of JPEG2000 image format. What is the main
       benefit of using wavelet transform?   [7M]

4. (a) Explain basic principles of Video compression and Motion estimation.   [7M]
   (b) Explain H.261 & MPEG video coding standards.   [7M]

5. What is circuit switching, packet switching & Write about Multimedia networks?   [14M]

6. Discuss about different data encryption standards & network security.   [14M]

7. Write short notes on (a) Content Based Image Retrieval (b) Digital Libraries.   [14M]

8. Write short notes on (a) Text compression (b) Error detection methods.   [14M]

[M16 CS 1210]

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[M16 CS 1211]
I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
WAVELET TRANSFORMS AND ITS APPLICATIONS

Time: 3 Hours   Max. Marks: 70

Answer any five questions
All question carry equal marks

1) (a) Define CWT. State the necessary conditions   [4 M]
    (b) Explain in detail about constant Q factor filtering interpretation of CWT   [10 M]

2   (a) What is PRQMF filter? Explain about Para unitary system and discuss about
        related issues of PRQMF filter banks   [10 M]
    (b) Explain about decimation and interpolation   [4 M]

3) (a) Define MRA. Write about discrete time MRA   [4 M]
   (b) With suitable example explain the redundancy in CWT   [10 M]

4) (a) Using CWT operator notation state and prove the properties of CWT   [7 M]
    (b) Write short notes on ICWT   [7 M]

5   (a) With illustration explain wavelet packet concept?   [10M]
    (b) Give examples of B spline wavelets   [4M]

6) (a) write about Huffman coding and Run length encoding.   [10M]
     (b) Explain transform coding.   [4 M]

7) (a) List out different applications of wavelet transforms.   [4 M]
    (b) Explain in detail about wavelet denoising.   [10 M]

8) (a) Explain 2D Wavelet Transforms.   [7M]
    (b) Interpret DTWT using continuous –time DWT.   [7M]

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I/II M.Tech. II Semester Regular Examinations
COMMUNICATION SYSTEMS
MODEL QUESTION PAPER
Statistical Signal Processing

Time: 3 Hours   Max. Marks: 70

Answer any five questions

All question carry equal marks.

1. (a) Explain the role of estimation in signal processing with examples.   [7M]
    (b) Give the mathematical formulation of estimation problem & How do you assess the
        estimator performance?   [7M]

2. (a) Show that sample mean estimator for DC level in White Gaussian Noise is unbiased.[7M]
    (b) Explain Minimum variance criterion for unbiased estimation.   [7M]

3.   (a) State and explain the importance of Cramer-Rao lower bound.   [7M]
    (b) Derive CR bound for the problem of estimating DC level embedded in AWGN.   [7M]

4. (a) Explain a basic linear model example estimation problem.   [7M]
    (b) Explain the principle of Maximum Likelihood Estimation.   [7M]

5. (a) Discuss the properties of the MLE (b) Solve the Bearing estimation problem using MLE
        Approach.   [14M]

6. Explain Bayesian Estimation methods. What are the advantages & difficulties?   [14M]

7. Write short notes on (a) Wiener filter (b) Kalman Filter.   [14M]

8. (a) What is a basic detection problem? How different it is from estimation problem?   [7M]
    (b) Explain Neyman-Pearson theorem. How do you represent detection performance of a NP
        detector?   [7M]

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