Code : *1PA322*

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech II Semester Regular December, 2013
High Speed Networks
(*DECS*)

Max. Marks: 60   Time: 03 Hours

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Answer *any five* full questions
All Questions carry equal marks (12 Marks each)

1. a. What are the different types of network services? Explain one of the services in detail.   6M

   b. Describe the layered architecture.   6M

2. a. Describe BRI and PRI interfaces of ISDN.   6M

   b. Briefly explain the IDN with examples and what the purpose of ISDN is.   6M

3. a. Write about virtual channels and virtual paths in ATM networks.   6M

   b. Discuss how traffic engineering is done by ATM networks.   6M

4. a. Explain about "ATM adaptation layer".   5M

   b. Discuss the different methods of error detection in each of the application adaptive layer.   7M

5. a. Distinguish between Banyan and Benes networks.   6M

   b. Design a square three stage Class network and explain   6M

6. a. Show how the rearrangeable networks are different from conventional networks.   6M

   b. Explain the looping algorithm for the rearrangeable networks.   6M

7. a. Explain PNNI routing mechanism with a suitable example.   6M

   b. Discuss and compare various TCP congestion control mechanisms.   6M

8. Produce a sketch of a frame transmitted on a LAN that shows the relative position of MAC, IP, TCP/UDP and application protocol control information.   12M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II Semester Regular Examinations, December 2013
Image and Video Processing
(*DECS*)

Max. Marks: 60   Time: 03 Hours
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Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a. Explain briefly about sampling and quantization? Explain uniform and Non uniform   6M
        sampling.

    b. Explain the term separability and translations in connection with Discrete Fourier   6M
        Transform.

2. a. Compare and contrast the relative merits and computational complexities involved in   6M
        frequency domain methods and spatial domain methods of image enhancement.

    b. What is meant by homomorphic filtering - Explain.   6M

3. a. Explain the diagonalization of Cirulant and Block cirulant matrices   6M

    b. Briefly explain the approach of inverse filtering method used for image restoration.   6M

4. a. Briefly explain simple global thresholidng and optimal thresholidng in connection with   6M
        image segmentation and detection.

    b. Explain the P-tile method in connection with the image segmentation.   6M

5   Explain the following:

    a. K-means algorithm for image segmentation.   6M

    b. Fuzzy C means algorithm for image segmentation.   6M

6. a. Explain how channel encodes and decodes play an important role in over all encoding   6M
        and decoding process.

    b. Distinguish between lossy and loss-less compression techniques. Explain the role of   6M
        Huffman coding with an illustration.

7. a. Explain the sampling process of video signals.   6M

    b. Compare region based and pixel based motion estimation methods.   6M

8. a. Explain the scalar and vector quantization for video coding.   6M

    b. What is wavelet? Explain how a wavelet transform is used for video coding?   6M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech II Semester Regular December, 2013
Microcomputer System Design
(*DECS*)

Time: 03 Hours   Max. Marks: 60

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Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1.	Explain the internal architecture of 8086 μp with neat diagram.	12M
2. a.	Briefly explain the new & enhanced instructions of 80286 μp.	06M
b.	What are the different addressing modes supported by 80286 μp.	06M
3. a.	What do you mean by paging? Explain the paging mechanism in 80386 μp.	08M
b.	Explain Virtual 8086 mode.	04M
4. a.	Explain the programming model of Pentium processor.	08M
b.	Briefly explain branch prediction logic.	04M
5. a.	Explain the dual core processor architecture.	08M
b.	Distinguish between Pentium & Pentium IV processor	04M
6. a.	Give the machine language code for each of the following instructions	06M
	(i) IN AL,52H (ii) OUT 0CH,AL (iii) OUT DX,AX (iv) IN AX,DX	
b.	Distinguish between programmed I/O and interrupt I/O.	06M
7. a.	Write a short note on common procedure sharing.	06M
b.	Explain how to manage memory so that its wasted space is kept minimum.	06M
8.	Write short notes on MMX and SIMD technology.	12M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II Semester Regular Examinations, December 2013
Coding Theory and Techniques
(*DECS*)

Max. Marks: 60   **Time: 03 Hours**

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Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a.   Explain the fixed length and variable length coding with relevant examples.   9M

    b.   What are the advantages of logarithmic measure of information.`   3M

2. a.   Explain the Shannon – Fano coding algorithm with an example.   6M

    b.   By using LZ coding algorithm, encode the sequence 110 100 11 11 100 110 100 11   6M
         100 101 111

3.   For a (7, 4) linear block code whose generator matrix is shown below.   12M

$$G = \begin{bmatrix} 1 & 1 & 1 & 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

         Find all possible code words, and verify the syndrome of the code word corresponding
         to the message 1101 is zero.

4. a.   Explain the limitations of the linear block codes in error correcting, and how they 6M
         are overcome in the Hamming codes.

    b.   Discuss about the Perfect codes   6M

5. a.   Prove that '*If g(x) is a polynomial of degree n–k and is a factor of x^n+1 (modulo-2),*   5M
         then g(x) is a generator polynomial that generates an (n, k) linear cyclic block
         code.'

    b.   Explain the decoding procedure of linear cyclic block codes with the help of block 7M
         diagram.

6.   Write short notes on the following   12M
             (a) Tree diagram
             (b) Trellis diagram

7. a.   Explain the decoding of convolution codes using 'Viterbi Algorithm'.   6M

    b.   Write the 'ZJ Algorithm' and draw the flow chart for the same.   6M

8.   Derive a circuit that is capable of multiplying any two elements in GF (2^5). Use   12M
         $P(x)=1+x^2+x^4$ to generate GF (2^5)

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech II Semester Regular December, 2013
Detection and Estimation of Signals
(*DECS*)

Max. Marks: 60   Time: 03 Hours

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Answer *any five* **questions**
All Questions carry equal marks (12 Marks each)

1. a. Determine the Fourier transform of the signal.   6M

$$x(n) = \begin{cases} A & \text{-M≤n≤+M} \\ 0 & \text{else where} \end{cases}$$

   b. Determine and sketch the magnitude and phase response of the following system.   6M

$$y[n] = \frac{1}{2}[x(n) - x(n-1)]$$

2. a. Explain about Neyman-pearson criterion and how it is used in the detection of radar   6M
      signals.

   b. Explain about Multiple Hypothesis testing.   6M

3. a. Explain about "Matched filter". Why it is called optimum filter.   6M

   b. What is the role of matched filter in the detection of radar signals?   6M

4. a. Explain the concept of "Composite Hypothesis testing"   6M

   b. What is Generalized likelihood ratio test? Explain its performance briefly for large   6M
      data records

5. a. Explain the maximum likelihood criteria in detail   6M

   b. Given $x = \frac{S}{2} + n$,n is Zero mean Gaussian with a variance of 1.Find the maximum   6M

      likelihood estimate $\widehat{S}_{ML}$ of ' x '.

6.   Explain in detail about the properties of Estimators   12M

7. a. Explain the significance of Linear prediction in estimation of signal   6M

   b. What is Vocoder? Explain the linear prediction applied to Vocoders?   6M

8. a. What is Adaptive filter? Explain the significance of adaptive filters in state   6M
      estimation?

   b. Explain the state estimation using Least mean square algorithm?   6M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech II Semester Regular December, 2013

DSP Processors and Architectures
(*Common to DECS, ES & VLSI Sys D*)

Max. Marks: 60   Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a. What are the various types of elementary sequences in digital signal processing for   6M
        analysis purpose? Give their definition and MATLAB representations?

    b. Explain the digital fitters with neat sketches.   6M

2. a. Explain briefly DSP computational errors.   6M

    b. Explain with suitable example the analysis of D/A conversion errors using   6M
        MATLAB.

3.   Explain briefly the DSP computational building blocks with suitable architecture.   12M

4.   Explain the following terms: 12M
            i) Pipeline depth
            ii) Branching effect.
            iii) Interrupt effects.
            iv) Stacks

5. a. Explain the memory organization in TMS 320C54XX DSP .   6M

    b. Explain the operation of parallel instruction of TMS 320C54XX.   6M

6. a. Write an algorithm to implement the FIR filter.   6M

    b. Explain how an adaptive filter can be implemented using LMS algorithms.   6M

7. a. Write an algorithm to implement an 8 point (DIT-FFT) on TMS 320C54XX.   6M

    b. Explain the computation of the signal spectrum and how it can be implemented on   6M
        DSP.

8. a. Explain how DMA is interfaced to a DSP.   6M

    b. Draw the CODEC interface circuit and explain.   6M

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