Hall Ticket Number :										

R14

Code: 4PA321

M.Tech. II Semester Regular & Supplementary Examinations Aug/Sep 2016

Coding Theory and Techniques

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT-I

1. a) Explain the fixed and variable length coding 4M

   b) Explain about Lempel-Ziv algorithm. And also apply the same for the following 11010011111001101001110010111 1 8M

OR

2. a) State and explain the Shannon -Fano coding with an example 6M

   b) Apply Shannon –Fano coding procedure and also calculate the coding efficiency of the following data

   $[x]= [x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8]$

   [P]=[0.1,0.25,0.05,0.15,0.15,0.1,0.15 0.05] 6M

UNIT-II

3. Consider the (7,4) linear block code whose generator matrix is given by

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

   i) find all the code words

   ii) find the parity check matrix

   iii) compute the syndrome for the received vector 1001001 is a valid code word or not 12M

OR

4. a) Explain about the Golay Codes with an example 8M

   b) List out the properties of Binary Golay codes 4M

UNIT-III

5. a) Design an encoder for the (7,4) binary cyclic code generated by $g(x)=1+x+x^3$ and verify its operation using the message vector (0101) 6M

   b) Explain about the decoding of cyclic codes with an example 6M

OR

6. a) Explain clearly about Syndrome Computation and Error detection 8M

   b) Write about the algebraic structure of cyclic codes 4M

UNIT-IV

7. a) Explain the principle of convolution encoder for (3,1),convolution code with a constant length of nine bits 6M

   b) Discuss about the tree diagram and trellis diagram 6M

OR

8. Design a (2,1,3) Viterbi decoding for the received vector Z=1101011001 12M

UNIT-V

9. Design (7.3) BCH Decoder for receiving vector at a receiver R=10000110111101011011 1 12M

OR

10. a) List out and elaborate the basic properties of Galois Fields 6M

    b) Construct Galois Fields $GF(2^5)$by using $P(x)= 1+x^2+x^4$ 6M

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Hall Ticket Number :											**R14**

Code: 4PA322

M.Tech. II Semester Regular & Supplementary Examinations Aug/Sep 2016

High Speed Networks

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT-I

1. a) Explain clearly with a reference model why there should be a layered architecture for networking. 6M

   b) Mention and explain various network mechanisms. 6M

OR

2. a) Why is there a need for B-ISDN? Explain. 6M

   b) Explain about three ISDN standard channel types in detail. 6M

UNIT-II

3. a) Define "Quality of Service". Explain on what factors quality of service of ATM depends. 6M

   b) Mention the applications of virtual channels in ATM networks. 6M

OR

4. a) Explain about ATM adaptation layer. 6M

   b) Illustrate various services of ATM. 6M

UNIT-III

5. a) With an example, explain about blocking phenomenon. 6M

   b) Write about three stage clos network with an example. 6M

OR

6. Explain about the Rearrangement of circuit using Folding algorithm with an example. 12M

UNIT-IV

7. a) Explain about addressing in ATM. 6M

   b) What is signaling? Write about UNI signaling in ATM Networks. 6M

OR

8. With an example, explain about PNNI routing in ATM networks. 12M

UNIT-V

9. a) Compare TCP and UDP protocols. 6M

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

OR

10. Write short notes on:

    (a) Internetworking

    (b) Integrated services. 12M

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Hall Ticket Number :										

R14

Code: 4PA323

M.Tech. II Semester Regular & Supplementary Examinations Aug/Sep 2016

Micro Computer System Design

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT-I

1. a) Explain the BIU and EU of 8086 with neat block diagram? 6M
   b) Explain the following instructions with an example?
      (i) ASCII adjust after addition.
      (ii) ASCI adjust after multiplication. 6M

OR

2. a) Draw and explain the complete architecture of 8086 microprocessor? 6M
   b) Explain the data copy/ transfer instructions with examples? 6M

UNIT-II

3. Explain the use of each following register of 80386.
   (i) Segment Descriptor Registers
   (ii) Control Registers
   (iii) Debug and Test Registers
   (iv) System address registers 12M

OR

4. a) Enlist the major architectural advancements in 80486 over 80386? 8M
   b) Enlist the data types supported by 80486? 4M

UNIT-III

5. a) Explain about model specific registers in Pentium 4 and core2 microprocessors. 8M
   b) Hyper Threading technology. 4M

OR

6. a) Explain the Model specific register of Pentium 4 and core2 microprocessors. 6M
   b) Explain about the dual processors and hyper-threaded processors. 6M

UNIT-IV

7. Assume that the four jobs A,B,C, and D, none of which involves I/O activity, are to be executed and their execution times are 60,20,40and 10 minutes, respectively. Given that all of the jobs are submitted to the system at the same time and in the order indicated in the proceeding sentence:
   a) Determine the average turnaround time if these jobs are executed serially in the order specified.
   b) Determine the average turnaround time under a non-prioritized time sharing system. Turnaround time for a job is defined as the time between the job being submitted and the job being completed. 12M

OR

8. a) Draw and explain the structure of prioritized ready queue. 6M
   b) What is memory fragmentation? How can it be reduced? 6M

UNIT-V

9. a) Explain the internal structure of the 80X87 arithmetic coprocessor. 6M
   b) Explain the Transcendental Operations of coprocessor. 6M

OR

10. a) Write the coprocessor Control Instructions 6M
    b) Illustrates the multiple data types that can appear in any XMM register for various SSE instructions. 6M

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Hall Ticket Number :										

R14

Code: 4PA324

M.Tech. II Semester Regular & Supplementary Examinations Aug/Sep 2016

Detection and Estimation of Signals

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT-I

1. a) Explain the different classifications of a discrete time signal. 6M

   b) State and prove the following properties of Discrete Fourier Transform
   i) Differentiation in time domain ii) Convolution property 6M

OR

2. a) Determine the Fourier transform of the following signals
   i) $x(n)=u(n-2)-u(n-6)$ ii) $x(n)=(1/2)^{-n}\,u(-n-1)$ 6M

   b) Determine and sketch the magnitude and phase response of the system $y(n)=\frac{1}{2}(x(n)+x(n-1))$ 6M

UNIT-II

3. What is the detection problem in a communication model and explain the Neyman- pearson criterion for the detection of a signal. 12M

OR

4. Explain the multiple hypotheses testing for the detection of a signal. 12M

UNIT-III

5. Discuss about matched filter characteristics used for radar applications. 12M

OR

6. Explain the performance of the detector in case of binary and Multiple ary case. 12M

UNIT-IV

7. Explain the performance of generalized likelihood ratio tests for large data records 12M

OR

8. Explain the Bayesian approach of hypothesis testing for the detection of signals. 12M

UNIT-V

9. What are the characteristics of a wiener filter and how the wiener filter is used for the estimation of signals 12M

OR

10. What is an adaptive filter? Explain the steepest descent algorithm for the stability. 12M

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Hall Ticket Number :										

R14

Code: 4PA325

M.Tech. II Semester Regular & Supplementary Examinations Aug/Sep 2016

Image and Video Processing

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT-I

1. a) Explain the fundamental steps in digital image processing. 6M

   b) Explain the Image formation model. 6M

OR

2. a) Derive the Haar Transform kernel matrix for N=4. 6M

   b) State and prove the following properties of 2-D DFT i) Rotation ii) Frequency Translation 6M

UNIT-II

3. a) Explain Histogram equalization and Histogram specification 7M

   b) Assume that the input gray levels have the PDF as $p_r(r) = -2r + 2 \quad for \;\; 0 \le r \le 1$ $= 0 \qquad\qquad otherwise$

   Show that the output PDF i.e $P_s(s)=1$ 5M

OR

4. a) Explain about smoothing and sharpening filters in spatial domain. 6M

   b) Explain about basic filtering in frequency domain. 6M

UNIT-III

5. a) How to diagonalize a circulant matrix. Explain the diagonalization of a circulant matrix with an example 8M

   b) Discuss about image restoration and degradation model 4M

OR

6. a) With the help of relevant expressions, explain degradation model used for image restoration 6M

   b) Explain about noise modeling, based on distribution function 6M

UNIT-IV

7. a) What are the different types of objective measures of Image Compression 6M

   b) The original image and reconstructed image are given below. Calculate the MSE(mean square error)

$$Original\ \mathrm{Im}age = \begin{bmatrix} 1 & 8 & 6 & 6 \\ 6 & 3 & 11 & 8 \\ 8 & 8 & 9 & 10 \\ 9 & 10 & 10 & 7 \end{bmatrix} \quad \mathrm{Re}constructed\ \mathrm{Im}age = \begin{bmatrix} 2 & 8 & 8 & 7 \\ 6 & 3 & 12 & 8 \\ 5 & 4 & 9 & 1 \\ 15 & 9 & 11 & 9 \end{bmatrix}$$

6M

OR

8. a) Explain about Hough Transform 6M

   b) Discuss about various Thresholding Techniques in image processing 6M

UNIT-V

9. State the conditions on spatio-temporal image intensity and velocity under which the optical flow equation can be used for displacement estimation. Why we do need the small motion assumption 12M

OR

10. Explain the various applications of motion estimation in video coding. 12M

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Hall Ticket Number :										

R14

Code: 4PB324

M.Tech. II Semester Regular & Supplementary Examinations Aug/Sep 2016

DSP Processors and Architectures

(Common to DECS Embedded Systems & VLSISD)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT-I

1. a) Perform an implementation for an 8-point DIT FFT algorithm which includes spectrum computation using FFT result 8M

   b) Explain Dynamic Range and precision in Detail 4M

OR

2. Differentiate A/D Conversion errors and D/A Conversion errors relevant to computational accuracy in DSP applications. 12M

UNIT-II

3. Explain the features for external interfacing in connection with programmable DSP devices. 12M

OR

4. a) With suitable example explain the data addressing capabilities for programmable DSP devices. 8M

   b) What is Braun multiplier? Explain 4X4 Braun multiplier 4M

UNIT-III

5. a) Explain the data addressing model of TMS320C45XX processors in detail. 8M

   b) WAP to implement PID controller on TMS320C54XX processor. 4M

OR

6. What are different interrupts of TMS320C54XX processor? Explain them. 12M

UNIT-IV

7. a) Explain about Adaptive filters in detail. 4M

   b) Discuss about Bit- reversed generation in detail. 8M

OR

8. Describe the sources of error for evaluating the computational accuracy in DSP implementations. 12M

UNIT-V

9. With suitable diagram explain the concept of memory interfacing to programmable DSP devices 12M

OR

10. a) Explain the memory space organization of programmable DSP devices with simple example 8M

    b) Explain a CODEC Interface circuit with its necessary programming by considering an example. 4M

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