R11

Code : 1PA321

M.Tech. II Semester Regular Examinations, July/August 2014

CODING THEORY AND TECHNIQUES

(DECS)

Time: 3 hours **Max Marks: 60**

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

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1.	a)	Compare fixed and variable length coding. What are the properties of prefix codes?	6M
	b)	Explain Source coding theorem and entropy	6M
2.	a)	Write note on Lempel-Ziv code	6M
	b)	Explain in detail about Huffman code with suitable example	6M
3.	a)	Define and briefly explain the following. Generator Matrix	4M
	b)	Systematic Linear Block codes.	4M
	c)	Parity Check Matrix.	4M
4.	a)	Explain with example hamming codes and perfect codes.	6M
	b)	Write about weight enumerators and Mac-Williams identities.	6M
5.	a)	Explain Cyclic codes.	6M
	b)	Apply systematic encoding algorithm for (7,3) cyclic code with generator polynomial g(x)=x4+x3+x2+1 to generate code word for message block (101).	6M
6.	a)	Briefly explain the following: Structural properties of Convolution codes and State diagram	6M
	b)	Trellis diagram and Tree diagram	6M
7.	a)	Write note on Stack Sequential decoding algorithms	6M
	b)	Explain application of Viterbi and sequential decoding.	6M
8		Write a short note on:	
	a)	BCH codes.	6M
	b)	Decoding procedure for BCH codes.	6M

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M.Tech. II Semester Regular Examinations, July/August 2014

DETECTION AND ESTIMATION OF SIGNALS

(DECS)

Time: 3 hours **Max Marks: 60**

Answer any FIVE of the following

All questions carry equal marks (12 Marks each)

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1 a) Consider an LTI system with impulse response $h(n)=\alpha^n u(n)$, $|\alpha|<1$ and the input of the system is $x(n)=\beta^n u(n)$, $|\beta|<1$. Find the output of the system $y(n)$ using the convolution property of discrete time Fourier transform. 6M

b) Using the properties of DTFT determine $x(n)$ whose Fourier transform is

$$X(e^{j\omega}) = \frac{1}{1-e^{-j\omega}}\left(\frac{\sin\frac{3}{2}\omega}{\sin\frac{1}{2}\omega}\right) + 5\pi\delta(\omega), \quad -\pi<\omega\leq\pi.$$

6M

2. a) Explain how to detect DC level in white Gaussian noise 8M

b) Discuss about minimum probability of error criterion. 4M

3. a) Explain the detection of sinusoidal signal $s(n) = A\cos(2\pi f_0 n+\Phi)$ in white Gaussian noise using linear model. 8M

b) Explain the performance of generalized matched filters. 4M

4. a) Derive the equation for detection probability of DC level in white Gaussian noise with unknown amplitude using Bayesian approach. 8M

b) Write about composite hypothesis testing. 4M

5. a) Explain maximum likely hood estimation. 6M

b) Explain Wiener filter for estimation. 6M

6. Explain the properties of estimators an derive the relation between bias, variance and mean square error. 12M

7. a) Derive the equation for backward prediction error power. 6M

b) Consider a wide sense stationary process $u(n)$ whose autocorrelation function has the following values: $r(0)=1$, $r(1)=0.8$, $r(2)=0.6$. The forward prediction error power is $P_2=0.8$. Determine the tap weights of forward predictor. 6M

8 Discuss about Steepest descent algorithm and its stability 12M

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Code : 1PA322

M.Tech. II Semester Regular Examinations, July/August 2014

HIGH SPEED NETWORKS

(DECS)

Time: 3 hours **Max Marks: 60**

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

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1. a) What are the network services and explain?
   b) Which are the network elements and explain?
2. a) Explain ATM and give the applications of ATM based services?
   b) Explain the general architecture of B-ISDN with the help of neat diagram?
3. a) What do you mean by network layering and explain?
   b) Explain the applications of virtual channels and connections?
4. a) Explain about traffic descriptors?
   b) What are the differences between the ATM layer and ATM adaptation layer and explain?
5. a) Explain the steps involved in routing algorithm?
   b) Explain the Batcher-Banyan networks?
6. Explain the following:
   (i) Bens network
   (ii) Folding algorithm
7. a) Explain about ATM addressing and UNI signaling?
   b) What is meant by PNNI routing and explain?
8. a) Explain about Passive and active Queue management?
   b) Explain about TCP congestion control?

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R11

Code : 1PA325

M.Tech. II Semester Regular Examinations, July/August 2014

IMAGE AND VIDEO PROCESSING

(DECS)

Time: 3 hours **Max Marks: 60**

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

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1.	a)	Find the Kernal Co-efficients of 1D Walsh Hadamard Transform.	8M
	b)	Briefly discuss about DCT.	4M
2.		Discuss the following techniques for image enhancement. (i) Median filtering (ii) Image Subtraction (iii) Derivative filters.	12M
3.	a)	Explain the concept of inverse filtering and what are the limitations of it	6M
	b)	Distinguish between image enhancement & Restoration	6M
4.	a)	Explain about Bi-level and multi-level thresholdings	6M
	b)	Explain edge based image segmentation in detail.	6M
5.		What is clustering? Explain different types of clustering techniques in brief.	12M
6.	a)	What are various redundancies present in an image? Draw the block diagram of an Image compression scheme and explain each block.	6M
	b)	Explain the encoding and decoding procedure in Arithmetic Coding?	6M
7.	a)	What is digital video? Explain ITU-R BT.601 digital video format specifications	6M
	b)	Explain the role of motion estimation in video coding.	6M
8.		Write short notes on the following a) Video coding Standards. b) Video filtering.	6M 6M

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R11

Code : 1PA323

M.Tech. II Semester Regular Examinations, July/August 2014

MICROCOMPUTER SYSTEM DESIGN

(DECS)

Time: 3 hours **Max Marks: 60**

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

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1.	a)	What is Memory Segmentation? Explain how segmentation provides effective task switching mechanism in 8086?	6M
	b)	Describe addressing modes of 8086 processor.	6M
2.	a)	Explain Register organization of 80286.	6M
	b)	Discuss briefly about 80286 instruction set.	6M
3.	a)	Explain the virtual memory access of 80486. How does it switch from one mode to another mode?	6M
	b)	Explain pin functions of 80386.	6M
4.	a)	Explain about interrupt process mechanism in Pentium Processors.	6M
	b)	Describe Pentium Pro addressing modes with suitable examples.	6M
5.	a)	Explain Registers in Dual Core Microprocessor	4M
	b)	Draw and discuss the functional block diagram of Pentium IV.	8M
6.	a)	Explain I/O Programming models.	6M
	b)	Explain about DMA operation.	6M
7.	a)	Explain the concept of virtual memory management of 80286.	6M
	b)	Explain the Semaphore Operations.	6M
8.		Discuss the internal structure of 8087 and Advanced Coprocessor.	12M

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R11

Code : 1PA421

M.Tech. II Semester Regular Examinations, July/August 2014

Neural Networks and Applications

(DECS)

Time: 3 hours **Max Marks: 60**

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

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1.	a)	Draw and structure and explain in detail the function of a biological neuron?	6M
	b)	Describe in detail about the various activation functions. Give their merits and demerits?	6M
2.	a)	Explain McCulloch Pitts Neuron Model. Generate the output of OR, NOT function using McCulloch-Pitts Neuron.	4M
	b)	State and prove perceptron convergence theorem	4M
	c)	Distinguish between i) Supervised & Unsupervised learning ii) Linear seperablity & Linearly non seperablilty	4M
3.	a)	What is MADALINE? Explain its training algorithm.	4M
	b)	Explain the significance of learning rate and momentum term in back propagation algorithm.	4M
	c)	Write short note on Radial Basis Function networks. Compare with multilayer perceptrons.	4M
4.	a)	Give the architecture and explain the training algorithm of Counter propagation Networks.	6M
	b)	What is Adaptive Resonance Theory (ART)? Explain how it overcomes stability plasticity dilemma in neural networks and give the significance of Vigilance parameter.	6M
5.	a)	What is Winner takes all Network. Give its architecture and explain the training algorithm.	7M
	b)	What is Self-Organizing network? Give examples.	5M
6.	a	What is pattern association? Describe and construct Energy function for a discrete Hopfield network and Show that the energy function decreases every time as the neuron output changes	8
	b	Construct a BAM to establish the following associations between four dimensional and two dimensional patterns (+1,+1,-1,-1) - (+1,+1) (+1,+1,+1,+1) - (+1,-1) (-1,-1,+1,+1) – (-1,+1)	4M
7.	a	Discuss the applications of neural network on the field of Image Processing.	6M
	b	Explain about VLSI implementation of Neural Networks.	6M
8.	a	What are the important applications in speech area? Discuss about any one application.	6M
	b	Explain the difficulties in the solution of travelling salesman problem by a feedback neural network.	6M

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