SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES

(Autonomous)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
QUESTION BANK
18ECE412   DIGITAL IMAGE PROCESSING

Question No.	Questions	PO Attainment
	UNIT 1: DIGITAL IMAGE FUNDAMENTALS & IMAGE TRANSFORMS	
	PART A (2 Marks)	
1	Define Image?	PO1,PO2
2	What is Dynamic Range?	PO1,PO2
3	What is meant by illumination and reflectance?	PO1,PO2
4	Define Digital image?	PO1,PO2
5	What are the steps involved in DIP?	PO1,PO2
6	List the properties of 2D Fourier transform.	PO1,PO2
\7	Mention two important properties of unitary transform?	PO1,PO2
8	Define Hadamard Transform.	PO1,PO2
9	Difference between of Walsh transform and Haar transform.	PO1,PO2
10	Write expression for Gray, Log and Gamma transformations	PO1,PO2
	PART-B (10 Marks)	
1.	In detail explain the fundamental steps involved in digital image processing systems.	PO1,PO2
2.	Describe the components of digital image processing system with a diagram.	PO1,PO2
3.	Explain the sensing and acquisition of an image.	PO1,PO2
4.	Describe briefly about different image file formats.	PO1,PO2
5.	Describe briefly about the applications of digital image processing.	PO1,PO2
6.	Demonstrate 1D walsh basis for the order N=4.	PO1,PO2
7.	Discuss about the Slant transform (1-D & 2-D)	PO1,PO2
8.	Derive Haar basis for N=2.	PO1,PO2
9.	Explain Slant transformation in detail.	PO1,PO2
10.	Compute the DCT matrix for N=4.	PO1,PO2
	UNIT 2: IMAGE ENHANCEMNT IN THE SPATIAL AND FREQUENCY DOMAIN	
	PART A (2 Marks)	
1.	Specify the objective of image enhancement technique.	PO1-PO3
2.	Write about the 2 categories of image enhancement.	PO1-PO3
3.	What is contrast stretching?	PO1-PO3
4.	Write expression for Gray, Log and Gamma transformations	PO1-PO3
5.	What is meant by masking?	PO1-PO3
6.	Give the formula for negative and log transformation.	PO1-PO3
7.	What is meant by bit plane slicing?	PO1-PO3
8.	What is meant by histogram equalization?	PO1-PO3
9.	Define histogram.	PO1-PO3
10.	What do you mean by Point processing?	PO1-PO3
11.	What is Image Negatives?	PO1-PO3
12.	Define Derivative filter?	PO1-PO3
	PART-B (10 Marks)	
1.	Explain the types of gray level transformation used for image enhancement.	PO1-PO3
2.	What is histogram? Explain histogram equalization.	PO1-PO3
3.	Discuss the image smoothing filter with its model in the spatial domain.	PO1-PO3

4.	What are image sharpening filters? Explain the various types of it.	PO1-PO3
5.	Explain spatial filtering in image enhancement.	PO1-PO3
6.	Describe image enhancement in the frequency domain.	PO1-PO3
7.	Explain Homomorphic filtering in detail.	PO1-PO3
8.	Describe the types of point Processing.	PO1-PO3
9.	Explain median filter in detail.	PO1-PO3
10.	Write the difference between linear and non linear gray level transformation.	PO1-PO3

UNIT 3:   IMAGE DEGRADATION/RESTORATION & IMAGE SEGMENTATION

PART A (2 Marks)		
1.	What is meant by image restoration?	PO1-PO3
2.	Differentiate enhancement from restoration.	PO1-PO3
3.	How a degradation process is is modeled?	PO1-PO3
4.	What are the types of noise models?	PO1-PO3
5.	What is pseudo inverse filter?	PO1-PO3
6.	What is least mean square filter?	PO1-PO3
7.	What is an edge?	PO1-PO3
8.	List out the properties of the second derivative around an edge.	PO1-PO3
9.	Define –Gradient Operator	PO1-PO3
10.	What is a global threshold?	PO1-PO3

PART-B (10 Marks)		
1.	Explain about the Inverse filtering.	PO1-PO3
2.	What is image restoration? Explain the degradation model for continuous function.	PO1-PO3
3.	Explain image degradation model /restoration process in detail .	PO1-PO3
4.	Explain the Wiener filtering approach for image restoration.	PO1-PO3
5.	How is edge detection performed? Write a suitable algorithm and explain the edge point linking.	PO1-PO3
6.	Explain the concept of thresholding in image segmentation and write its merits and demerits.	PO1-PO3
7.	Explain noise models briefly.	PO1-PO3
8.	Discuss about mean order statistic and adaptive filters.	PO1-PO3

UNIT 5:   IMAGE COMPRESSION & COLOR IMAGE PROCESSING

PART A (2 Marks)		
1.	What is the need for compression.	PO1-PO3
2.	Define –Compression Ratio.	PO1-PO3
3.	What is image compression?	PO1-PO3
4.	What is data compression?	PO1-PO3
5.	What are the types of data compression?	PO1-PO3
6.	Define –Coding Redundancy	PO1-PO3
7.	Define – Interpixel Redundancy	PO1-PO3
8.	What is run length coding?	PO1-PO3
9.	What is JPEG?	PO1-PO3
10.	Define color models.	PO1-PO3

PART B (10 Marks)		
1.	Explain the image compression model with a neat diagram.	PO1-PO3
2.	Explain the need for image compression. How run length encoding approach is used for	PO1-PO3

	compression?	
3.	Differentiate lossless compression from lossy compression	PO1-PO3
4.	What is data redundancy? Explain three basic data redundancy?	PO1-PO3
5.	A source emits four symbols {a,b,c,d} with probabilities {0.4, 0.2, 0.1, 0.3} respectively. Construct arithmetic coding to encode the word 'dad'.	PO1-PO3
6.	Explain about Transform based compression.	PO1-PO3
7.	Describe BTC with procedure.	PO1-PO3
8.	Explain about JPEG2000 standard.	PO1-PO3
9.	Describe about color models.	PO1-PO3
10.	Explain image compression model.	PO1-PO3

UNIT 5:   IMAGE REPRESENTATION AND OBJECT RECOGNITION

PART A (2 Marks)		
1.	Classify the types of representations	PO1-PO3
2.	List the properties of fourier descriptors	PO1-PO3
3.	How the first difference is calculated in chain code?	PO1-PO3
4.	Name the approaches used to describe the texture of a region	PO1-PO3
5.	Discuss the method used to define skeleton.	PO1-PO3
6.	Develop the steps for Shape number in image segmentation?	PO1-PO3
7.	Summarize convex hull and convex deficiency concepts	PO1-PO3
8.	Formulate the Equation of circularity ratio of regional descriptors	PO1-PO3
9.	Define region growing	PO1-PO3
10.	How the topology is applied in image processing?	PO1-PO3
PART B (10 Marks)		
1.	Explain the different types of boundary descriptors with suitable diagrams	PO1-PO3
2.	State the concepts of following methods A) Signature B) Boundary segments	PO1-PO3
3.	How the merging techniques applied in approximation and also develop the steps involed in approximation method	PO1-PO3
4.	What are all the object recognition method used in image processing for decision making methods?How that methods apply in pattern classification.	PO1-PO3
5.	Examine the regional descriptors with basic diagrammatic representations	PO1-PO3
6.	Analase the relational descriptors with basic equations	PO1-PO3
7.	Evaluate the optimum statistical classifiers and neural networks method for regonition	PO1-PO3
8.	Analyse the different approaches of pattern and pattern classes	PO1-PO3
9.	Explain the structural methods of object recognition A)Matching shape numbers B)String matching	PO1-PO3
10.	Elaborate the decision theoretic methods for recognition	PO1-PO3