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INSTITUTE OF TECHNOLOGY & MANAGEMENT
(Approved by AICTE-New Delhi, Accredited by NAAC with 'A' & Affliated to JNTU, Hyderabad)
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Department of Electronics & Communication Engineering

QUESTION BANK

Course Name : DIGITAL IMAGE PROCESSING
Course Code : 57040
Class : IV- B.Tech
Branch : ECE
Year : 2017-18
Course Faculty : Mr. BN.SRINIVAS

UNIT -1

S.No:	QUESTION	Blooms Taxonomy Level	Course outcome
	SHORT ANSWER QUESTIONS		
1	List the steps involved in digital image processing	Knowledge	a
2	How do you represent the digital images?	Knowledge	a
3	Explain about sampling and quantization of an image.	Understand	a
4	Explain a simple Image formation model	Analysis	c
5	Name various arithmetic and logical operations that can be done on Images	Knowledge	a
6	What are the different fields in which Digital Image Processing is used?	Knowledge	b
7	Explain about some of the geometrical operations that can be done on images	Applying	b
8	Distinguish between Fourier Magnitude Spectrum, Fourier Phase Spectrum and Power spectrum.	Understand	a
9	Define discrete cosine transform	Understand	a
10	How do you represent the digital images?	Analyze	c
11	Write the expressions for Walsh transform kernel and Walsh transform (1D &2D)	Knowledge	a
12	Discuss about the Slant transform (1-D & 2-D)	Knowledge	a
13	Discuss about the Hadamard transforms (1-D & 2-D)	Understand	a
14	Write about various edge Detectors available in function edge	Analysis	c
15	Explain the following properties of 2D-Fourier Transform: Rotation and scaling	Knowledge	a
16	Explain the following properties of 2D-Fourier	Knowledge	b

	Transform: Distributives and scaling		
17	Explain the following properties of 2D-Fourier Transform Periodicity and conjugate symmetry	Applying	b
18	Explain the following properties of 2D-Fourier Transform Seperability	Understand	a
19	Explain the following properties of 2D-Fourier Transform (a)Translation (b) Scaling	Understand	a
20	Discuss the following intensity transformations. (a) Image negatives (b) Contrast stretching	Analyze	c
21	Explain about components of an Image Processing System	Knowledge	a
22	Explain DCT?	Understand	a
23	Explain Walsh transform	Analysis	c
24	Explain Hadamard Transform	Knowledge	a
25	Explain the haar Trans form	Analyze	c
26	What are the advantages of non uniform sampling	Knowledge	a
27	Distinguish between uniform sampling and non uniform sampling with respect to Images.	Analyze	a
28	Explain the steps involved in digital image sequence	Understand	a
29	Explain walsh transform for N=4	Analyze	a
30	Explain DCT for N=4	Knowledge	a
	LONG ANSWER QUESTIONS		
1	Explain the steps involved in digital image processing	Analyze	a
2	Discuss about the following relationships between pixels with neat diagrams i) Neighbors of a pixel ii) Connectivity iii) Distance measures iv) Path	Understand	a
3	Write the expressions for Walsh transform kernel and Walsh transform (1D &2D).	Analyze	a
4	Briefly explain the forward and inverse transformation kernels of image transforms	Knowledge	a
5	Name and explain some important properties of 2-D DFT	Understand	b
6	Discuss about the Slant transform (1-D & 2-D)	Analyze	c
7	Discuss about the Hadamard transforms (1-D & 2-D)	Understand	b
8	Discuss about the Haar transform (1-D & 2-D)	Analyze	c
9	Discuss about the Hotelling transforms (1-D & 2-D)	Analyze	a
10	State and prove separability property of 2D-DFT.	Analyze	c

11	State and prove the translation property	Creating	c
12	State distributivity and scaling property	Creating	b
13	Explain 2d fft properties	Creating	a
14	List the steps involved in digital image processing	Applying	b
15	Explain about sampling and quantization of an image	Applying	c
16	Explain a simple Image formation model	Applying	b
17	Distinguish between Fourier Magnitude Spectrum, Fourier Phase Spectrum and Power spectrum.	Creating	b
18	Define discrete cosine transform	Applying	b
19	Discuss about the following relationships between pixels with neat diagrams i) Neighbors of a pixel ii) Connectivity iii) Distance measures iv) Path	Applying	c
20	Briefly explain the forward and inverse transformation kernels of image transforms	Applying	c

UNIT -2

S.No:	QUESTION	Blooms Taxonomy Level	Course outcome
	SHORT ANSWER QUESTIONS		
1	Narrate the concept of derivative filters	Knowledge	a
2	Discuss how the derivative filters are used in Digital Image Enhancement?	Knowledge	a
3	Describe Histogram Specification	Understand	a
4	Explain Gray level transformation functions for contrast enhancement	Analysis	c
5	Discuss the Image negatives transformations	Knowledge	a
6	Discuss the Contrast stretching transformations	Knowledge	b
7	Explain the Local enhancement	Applying	b
8	Explain the Image subtraction	Understand	a
9	Explain the Image averaging	Understand	a
10	What is the objective of image enhancement? Define spatial domain. Define point processing	Analyze	c
11	Describe Histogram Specification	Knowledge	a
12	Discuss the Contrast stretching transformations	Knowledge	a
13	Explain the Image averaging	Understand	a
14	What is the objective of image enhancement? Define spatial domain. Define point processing	Analysis	c
15	Discuss how the Bit Plane Slicing is useful in	Knowledge	a

	image processing		
16	How does the spatial filter with name Order static filter (non-linear filter) or median filter work?	Knowledge	b
17	What is meant by image enhancement by point processing? Discuss any two methods in it.	Applying	b
18	Description of Homomorphic filtering	Understand	a
19	Describe the techniques used for color image smoothing	Understand	a
20	What is the need of graylevel slicing in color images	Analyze	c
21	Explain on procedure to derive frequency domain filtering from spatial domain	Knowledge	a
22	Explain the method to set the cut off frequencies in ILPF?	Knowledge	a
23	Correspondence between filtering in the spatial & frequency domains	Understand	a
24	Explanation on the basic steps for filtering used to enhance an image in frequency domain	Analysis	c
25	Explain the concept of homomorphic filtering	Knowledge	a
26	Give the algorithm for histogram equalization	Knowledge	b
27	What is the histogram distribution for high contrast, low contrast images	Applying	b
28	Compare LPF & HPF	Understand	a
29	What are the techniques used for image smoothing? Explain Frequency domain	Understand	a
30	Explain the need of color image smoothing	Analyze	c
	LONG ANSWER QUESTIONS		
1	Explain smoothing spatial filters and nonlinear order statistic spatial filters	Analyze	a
2	Explain about Prewitt and Sobel edge Detectors	Understand	a
3	Describe image Histogram Equalization	Analyze	a
4	Explain the method of using the second derivate for Image sharpening by Laplacian Operator		
5	What is high boost spatial filtering? Compare it with high pass spatial filtering	Understand	b
6	Discuss how the Bit Plane Slicing is useful in image processing	Analyze	c
7	Discuss the importance of a kernel or mask or window in spatial filtering used for enhancement of a digital image	Understand	b
8	How does the spatial filter with name Order static filter (non-linear filter) or median filter work?	Analyze	c

9	What is meant by image enhancement by point processing? Discuss any two methods in it.	Analyze	a
10	Define histogram of a digital image. Explain how histogram is useful in image enhancement?	Analyze	c
11	Write about Smoothing Spatial filters	Creating	c
12	What is meant by the Gradiant and the Laplacian? Discuss their role in image enhancement.	Creating	b
13	Description of Homomorphic filtering	Creating	a
14	How to enhance image in spatial domain	Applying	b
15	Classify enhancement processing techniques	Applying	c
16	Analyze histogram manipulation	Applying	b
17	Illustrate filtering in spatial domain	Creating	b
18	Discuss how the derivative filters are used in Digital Image Enhancement?	Applying	b
19	Explain Gray level transformation functions for contrast enhancement	Applying	c
20	What is high boost spatial filtering? Compare it with high pass spatial filtering	Applying	c

UNIT -3

S.No:	QUESTION	Blooms Taxonomy Level	Course outcome
	SHORT ANSWER QUESTIONS		
1	Compare image enhancement and restoration techniques?	Knowledge	a
2	Give the probability density functions for Rayleigh noise models	Knowledge	a
3	Explain about iterative nonlinear restoration	Understand	a
4	Give the probability density functions for Gaussian noise models	Analysis	c
5	Give the probability density functions for Salt and Pepper noise models	Knowledge	a
6	Explain the method of Constrained Least Squares Filtering for image restoration	Knowledge	b
7	Explain three principle ways to estimate the	Applying	b

	degradation function for use in image restoration		
8	Discuss the process of image restoration by direct inverse filtering?	Understand	a
9	Write about Noise Probability Density Functions for all noise models	Understand	a
10	Explain about iterative nonlinear restoration using the Lucy– Richardson algorithm.	Analyze	c
11	Compare image enhancement and restoration techniques?	Knowledge	a
12	Explain model of image degradation/restoration process with a block diagram	Knowledge	a
13	Explain the method of Constrained Least Squares Filtering for image restoration	Understand	a
14	Discuss the process of image restoration by direct inverse filtering?	Analysis	c
15	What is meant by degradation functions? Explain the process of estimating the degradation function	Knowledge	a
16	Explain about Fourier transform. Discuss how it can be used for image restoration	Knowledge	b
17	Explain about Fourier transform. Discuss how it can be used for image restoration	Applying	b
18	Explain in detail about different types of order statistics filters for Restoration	Understand	a
19	Distinguish between high pass and low pass filters	Understand	a
20	What is the use of processing an image? Explain various applications of Image	Analyze	c
21	Expalain Degradation model	Understand	c
22	Discuss Algebraic approach to restoration	Analysis	a
23	What is Inverse filtering	Knowledge	b
24	Explain least mean square filters	Knowledge	b
25	Explain Interactive Restoration	Applying	a
26	Explain Constrained Restoration	Understand	a
27	Explain Un Constrained Restoration	Understand	c
28	Explain Restoration analysis	Knowledge	a
29	Explain Un Constrained Least squares Restoration	Understand	B
30	Explain Distinguish between LPF & HPF	Analysis	a
	LONG ANSWER QUESTIONS		
1	Explain the method of Least Mean Squares Filtering (Wiener) for image restoration	Analyze	a
2	Explain model of image degradation/restoration process with a block diagram	Understand	a

3	Explain the method of Constrained Least Squares Filtering for image restoration	Analyze	a
4	Explain three principle ways to estimate the degradation function for use in image restoration	Creating	c
5	Discuss the process of image restoration by direct inverse filtering?	Understand	b
6	Write about Noise Probability Density Functions for all noise models	Analyze	c
7	Explain about iterative nonlinear restoration using the Lucy– Richardson algorithm.	Understand	b
8	Compare image enhancement and restoration techniques?	Analyze	c
9	Give the probability density functions for Rayleigh noise models	Analyze	a
10	Explain the method of Least Mean Squares Filtering (Wiener) for image restoration	Analyze	c
11	Explain model of image degradation/restoration process with a block diagram	Creating	c
12	Explain the method of Constrained Least Squares Filtering for image restoration	Creating	b
13	Discuss the process of image restoration by direct inverse filtering?	Creating	a
14	Explain about iterative nonlinear restoration using the Lucy– Richardson algorithm.	Applying	b
15	Discuss the need for image restoration and also describe various noise models	Applying	c
16	What is meant by degradation functions? Explain the process of estimating the degradation function	Applying	b
17	Explain about Fourier transform. Discuss how it can be used for image restoration	Creating	b
18	Name different types of estimating the degradation function for use in image restoration and explain in detail estimation by modeling	Applying	b
19	Explain in detail the constrained least squares filtering with related expressions	Applying	c
20	Compare image enhancement and restoration techniques?	Applying	c

UNIT -4

S.No:	QUESTION	Blooms Taxonomy Level	Course outcome
	SHORT ANSWER QUESTIONS		
1	Determine edges and boundary	Knowledge	a
2	Design threshold models	Knowledge	a
3	Develop region segmentation	Understand	a
4	Write about edge detection	Analysis	c
5	Explain about the Local processing for edge linking	Knowledge	a
6	Write the mask for prewitt operator	Knowledge	b
7	Write the mask for sobel operator	Applying	b
8	Define segmentation	Understand	a
9	Explain about the Global processing via graph-theoretic techniques for edge linking	Understand	a
10	Explain about edge detection	Analyze	c
11	Explain about line detection	Knowledge	a
12	What is meant by image segmentations?	Knowledge	a
13	Discuss various applications of segmentation	Understand	a
14	What is meant by discontinuities in an image?	Analysis	c
15	Discuss about point detection, line detection.	Knowledge	a
16	What is segmentation	Knowledge	b
17	What is edge detection	Applying	b
18	Explain region splitting	Understand	a
19	Explain thresholding definition	Understand	a
20	Define edge detection	Analyze	c
21	Classify various wavelet transforms	Knowledge	a
22	Design Filter banks	Knowledge	a
23	Develop Wavelet based applications	Understand	a
24	What is a wavelet	Analysis	c
25	Explain Scaling concepts in a wavelet transform?	Knowledge	a
26	Specify some wavelets	Knowledge	b
27	Explain Visu shrink method of wavelet thresholding	Applying	b
28	Explain SureShrink method of wavelet thresholding	Understand	a
29	Explain BayesShrink method of wavelet thresholding	Understand	a
30	What is discrete wavelet transform	Analyze	c
	LONG ANSWER QUESTIONS		
1	Write about edge detection	Analyze	a
2	Explain about the Local processing for edge linking	Understand	a
3	Write short note on Region Growing	Analyze	a
4	Write the mask for prewitt operator	Knowledge	a
5	Write the mask for sobel operator	Understand	b

6	Write the mask for laplacian operator	Analyze	c
7	Define segmentation	Understand	b
8	What are the derivative operators useful in image segmentation? Explain their role in segmentation	Analyze	c
9	What is thresholding? Explain about global thresholding	Analyze	a
10	Explain about basic adaptive thresholding process used in image segmentation	Analyze	c
11	Explain in detail the threshold selection based on boundary characteristics	Creating	c
12	Explain about region based segmentation	Creating	b
13	What are the derivative operators useful in image segmentation? Explain their role in segmentation	Creating	a
14	Explain about the Global processing via the Hough Transform for edge linking	Applying	b
15	Explain about the Global processing via graph-theoretic techniques for edge linking	Applying	c
16	Explain about Region Splitting and Merging with an example	Applying	b
17	What are the derivative operators useful in image segmentation? Explain their role in segmentation	Creating	b
18	Explain about basic adaptive thresholding process used in image segmentation	Applying	b
19	What are the derivative operators useful in image segmentation? Explaintheir role in segmentation	Applying	c
20	Explain about the Global processing via the Hough Transform for edge linking	Applying	c

UNIT -5

S.No:	**QUESTION**	**Blooms Taxonomy Level**	**Course outcome**
SHORT ANSWER QUESTIONS			
1	Classify various reduncies	Knowledge	a
2	Categorize compression models	Knowledge	a
3	Model Error free compression	Understand	a

4	Model lossy compression	Analysis	c
5	Summarize JPEG 2000 Standards	Knowledge	a
6	What is image compression	Knowledge	b
7	Define image compression	Applying	b
8	What is data redundancy	Understand	a
9	What is relative data redundancy?	Understand	a
10	Compare with data redundancy with relative data redundancy	Analyze	c
11	Explai the difference between lossy & loss less compression	Knowledge	a
12	Explain source encoder	Knowledge	a
13	Explain source decoder	Understand	a
14	What is Huffman coding	Analysis	c
15	What is variable coding	Knowledge	a
16	What is arithmetic coding	Knowledge	b
17	Give the block diagram of lossy compreesion technique	Applying	b
18	Give the block diagram of lossless compreesion technique	Understand	a
19	Give the block diagaram of source encoder	Understand	a
20	Give the block diagaram of source decoder	Analyze	c
21	Define image compression. Explain about the redundancies in a digital Image.	Understand	a
22	Explain about Image Compression Models	Analysis	c
23	Explain about fidelity criterion	Knowledge	a
24	Explain a method of generating variable length codes with an example	Knowledge	b
25	Explain arithmetic encoding process with an example	Applying	b
26	Explain the concept of bit plane coding method	Understand	a
27	Explain about lossless predictive coding	Understand	a
28	Explain about lossy predictive coding	Analyze	c
29	Explain about wavelet coding	Applying	b
30	Explain about predictive coding techniques	Understand	a
LONG ANSWER QUESTIONS			
1	Explain image compression indetail	Analyze	a
2	Explain Coding Redundancy	Understand	a
3	Explain Interpixel Redundancy	Analyze	a
4	Explain Psychovisual Redundancy	Creating	c
5	What are the characteristics of lossy compression	Understand	b
6	What are the characteristics of lossless compression	Analyze	c
7	Explain about fidelity criterion	Understand	b

8	Explain about image compression models	Analyze	c
9	Explain a method of generating variable length codes with an example	Analyze	a
10	Explain arithmetic encoding process with an example	Analyze	c
11	Explain LZW coding with an example.	Creating	c
12	Explain the concept of bit plane coding method	Creating	b
13	Explain about lossless predictive coding	Creating	a
14	Explain about lossy predictive coding	Applying	b
15	Explain with a block diagram about transform coding system	Applying	c
16	Explain about JPEG compression standard and the steps involved in JPEG compression	Applying	b
17	What are the types of compression used in image applications? Mention the re-quirements of compression.	Creating	b
18	What is image compression? What is the need for compression	Applying	b
19	What are the parameters used to measure the quality of an image	Applying	c
20	With a neat diagram explain indetail a general image compression system model.	Applying	c