SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)
SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

QUESTION BANK

VII SEMESTER
1906704 DIGITAL IMAGE PROCESSING
(Common to VII Semester Medical Electronics)
Regulation – 2019
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SUBJECT : 1906704 DIGITAL IMAGE PROCESSING

SEM / YEAR: VII/ IV year B.E.

	Unit I - DIGITAL IMAGE FUNDAMENTALS			
	Steps in Digital Image Processing – Components – Elements of Visual Perception –Types of Images: Monochrome and Color model, Chromatic diagram, Image Sensing and Acquisition – Image Sampling and Quantization – Relationships between pixels - color image fundamentals, RGB, HIS models.			
	PART - A			
Q. No	Questions		BT Level	Competence
1.	List the color models involved in hardware.		BTL 1	Remembering
2.	Specify the basic components of image processing system.		BTL 1	Remembering
3.	State the term ‘Image’.		BTL 2	Understanding
4.	Outline about fovea.		BTL 1	Remembering
5.	Mention the applications of image processing.		BTL 1	Remembering
6.	Classify the types of image sensing sensors.		BTL 1	Remembering
7.	What are the primary and secondary colors?		BTL 1	Remembering
8.	Summarize the membranes of human eye.		BTL 3	Applying
9.	Define the terms: Hue, Saturation, Grey level.		BTL 2	Understanding
10.	How a digital image can be represented?		BTL 2	Understanding
11.	Draw the photonic electromagnetic spectrum.		BTL 3	Applying
12.	Identify the various multispectral bands and their applications.		BTL 3	Applying
13.	Outline the function of an image sensor.		BTL 4	Analyzing
14.	Write the difference between regions and boundaries.		BTL 3	Applying
15.	Point out the steps for analog to digital conversion, state its need.		BTL 4	Analyzing
16.	Examine about adjacency and connectivity.		BTL 4	Analyzing
17.	Compare Brightness and Contrast.		BTL 4	Analyzing
18.	Explain the term Weber ratio and Quantization.		BTL 4	Analyzing
19.	Brief that how an image to be sensed by human eye?		BTL 2	Understanding
20.	Write about 4 connectivity, 8 connectivity and m connectivity in pixels.		BTL 3	Applying
21	Write the equation for primary colors.		BTL 4	Analyzing
22	Mention the wave length of primary colors.		BTL 2	Understanding
23	Draw the Venn diagram model for subtractive model.		BTL 2	Understanding
24	State the various color models used in image processing.		BTL 3	Applying

	PART- B			
1.	Explain in detail the fundamental steps involved in digital image processing systems.	(13)	BTL 1	Remembering
2.	What are the components of digital image processing system? Explain in detail about each block with necessary diagrams.	(13)	BTL 1	Remembering
3.	(i)Summarize the human visual perception system in detail with necessary diagrams. (ii) Explain CMY and CMYK color models.	(7) (6)	BTL 2	Understanding
4.	Outline in detail about: i)RGB model, ii) HSI model.	(7) (6)	BTL 2	Understanding
5.	i) Write in detail about image acquisition system. ii) Illustrate how the image is digitized by sampling and quantization process.	(7) (6)	BTL 2	Understanding
6.	Describe in detail about various sensors of Image acquisition systems	(13)	BTL 3	Applying
7.	i) How the digital images are represented write in detail. ii) Analyze that how the image formation takes place in eye and state the principle of operation of brightness adaption and discrimination.	(6) (7)	BTL 4	Analyzing
8.	Distinguish the following terms and brief each: i) Adjacency, ii) Connectivity, iii) Region, iv) Boundary.	(13)	BTL 4	Analyzing
9.	Evaluate the various color models. Explain each of them in detail.	(13)	BTL 4	Analyzing
10.	Explain in detail about: i) Image sampling, ii)Quantization.	(7) (6)	BTL 3	Applying
11.	i) Mention the applications of image processing ii) Write in detail about sensing and acquisition techniques.	(3) (10)	BTL 1	Remembering
12.	Briefly define the following terms: i) image restoration, ii) Compression, iii) Segmentation, iv) Morphological processing.	 (3) (3) (3) (4)	BTL 1	Remembering
13.	Explain the principle of operation of human eye with suitable diagrams.	(13)	BTL 2	Understanding
14.	Classify the various components of image processing also distinguish it based on output nature of the components.	(13)	BTL 4	Analyzing
15.	Illustrate the various color wavelength using chromatic diagram.	(13)	BTL 3	Applying
16.	Define the term color. Compare and contrast the following: i) Binary Image, ii) Gray Image.	(4) (5)	BTL 1	Remembering

	iii) Color Image	(4)		
17.	Describe about the following: i. Monochrome model, ii. Color model.	(7) (6)	BTL 3	Applying
	PART - C			
1	Explain with suitable examples the various relationships between pixels and describe them in detail.	(15)	BTL 2	Understanding
2	Describe about image quantization and sampling and their importance and need in digital image processing.	(15)	BTL 1	Remembering
3	Explain the various color models with appropriate examples.	(15)	BTL 1	Remembering
4	Illustrate in detail about the need for various steps in digital image processing. Explain their prominence of each block with diagram.	(15)	BTL 3	Applying
5	Elaborate the normalized plot of the colour response CIE 1931 standard with explanations.	(15)	BTL 4	Analyzing

	UNIT II IMAGE ENHANCEMENT			
	Spatial Domain: Gray level transformations – Histogram processing – Basics of Spatial Filtering– Smoothing and Sharpening Spatial Filtering – Frequency Domain: Introduction to Fourier Transform – Smoothing and Sharpening frequency domain filters – Ideal, Butterworth and Gaussian filters. Homomorphic filtering, Color image enhancement.			
	PART- A			
Q. No	Questions		BT Level	Competence
1.	Discuss about image filtering?		BTL 2	Understanding
2.	Summarize about histogram equalization.		BTL 2	Understanding
3.	Explain the two categories of image enhancement.		BTL 2	Understanding
4.	List various gray level transformation techniques.		BTL 1	Remembering
5.	Define the term histogram specification.		BTL 1	Remembering
6.	Specify the need for image enhancement.		BTL 4	Analyzing
7.	What is spatial domain method?		BTL 1	Remembering
8.	Write about Histogram?		BTL 1	Remembering
9.	Distinguish between smoothing and sharpening filters.		BTL 4	Analyzing
10.	Outline the mechanics of spatial filtering.		BTL 3	Applying
11.	Define frequency domain method.		BTL 1	Remembering
12.	Write expression for Gray, Log and Gamma transformations.		BTL 1	Remembering
13.	Identify the different type of derivative filters in DIP.		BTL 3	Applying
14.	Mention the effect of under sampling process.		BTL 3	Applying
15.	Illustrate with examples for linear and nonlinear filters?		BTL 2	Understanding
16.	Justify the need for image transform.		BTL 3	Applying
17.	State the 2D sampling theorem.		BTL 3	Applying
18.	Categorize the various frequency domain filters.		BTL 4	Analyzing
19.	Write the 2D Fourier transform and its inverse.		BTL 4	Analyzing
20.	Mention the link between spatial and frequency domain filtering.		BTL 4	Analyzing
21.	Write note about homomorphic filtering.		BTL 4	Analyzing

22.	Outline the various techniques involved in gray image enhancement.		BTL 2	Understanding
23.	Write the list of steps involved in color image enhancement		BTL 2	Understanding
24.	Summarize the techniques used for color image enhancement.		BTL 3	Applying
	PART – B			
1.	Describe histogram equalization. Obtain Histogram equalization for the following image segment of size 5 x 5? Write the inference on image segment before and after equalization. 20 20 20 18 16 15 15 16 18 15 15 15 19 15 17 16 17 19 18 16 20 18 17 20 15	(13)	BTL 1	Understanding
2.	Infer the difference between spatial correlation and convolution. Explain each with identical example.	(13)	BTL 4	Analyzing
3.	i) Explain the histogram equalization method of image enhancement. ii)Discuss histogram specification technique in detail with equations.	(7) (6)	BTL 2	Understanding
4.	From the fundamentals explain with example: i) Spatial smoothening ii) Spatial sharpening	 (7) (6)	BTL 3 BTL 3	Applying Applying
5.	i)Obtain Histogram and Histogram equalization for a given image (4 x 4) – 4 bit per pixel is given by 10 12 8 9 10 12 12 14 12 13 10 9 14 12 10 12 ii) Find the convolution of the sequences f={ 0,0, 0,1,0,0,0}, w= {1,2,3,2,8}	(7) (6)	BTL 3	Applying
6.	i) Deduce about spatial enhancement techniques and Median filtering ii) Compare the various image transformation technique	 (7) (6)	BTL 2	Understanding
7.	i) With example explain in detail about spatial averaging. ii) Describe in detail about various types of mean filters.	(7) (6)	BTL 3	Applying
8.	Show the various techniques in frequency domain to enhance an image with necessary examples	(13)	BTL 1	Remembering
9.	Illustrate the 2D Fourier transform and its pair. State and prove their property.	(13)	BTL 2	Understanding
10.	i) State and explain sampling theorem in 2D ii) Write about aliasing in Images	(7) (6)	BTL 3	Applying

11.	Tabulate the various filters available under frequency domain for image enhancement	(13)	BTL 1	Remembering
12.	Write detail note about i) Spatial and Frequency domain enhancement ii) Discrete Fourier Transform	(7) (6)	BTL 1	Remembering
13.	i) Point out the comparison between smoothing & sharpening in frequency domain ii) Analyze the performance of following smoothing filters Ideal Low Pass Filter, Butterworth Low Pass Filter, Gaussian Low Pass Filter.	(7) (6)	BTL 4	Analyzing
14.	i)Distinguish between spatial & frequency domain image enhancement ii) Classify the performance of following sharpening filters Ideal HPF Butterworth HPF Gaussian HPF	(7) (6)	BTL 4	Analyzing
15.	How the color image enhancement differs from gray image enhancement write in detail.	(13)	BTL 1	Remembering
16.	Discuss in detail about Homomorphic filtering.	(13)	BTL 2	Understanding
17.	With suitable diagram explain the process of color image enhancement.	(13)	BTL 4	Analyzing
	PART – C			
1.	Describe the constraints of histogram equalization and technique of histogram processing in detail.	(15)	BTL 2	Understanding
2.	Explain about the various grey level transformations with examples and plot the graph of the transformation functions.	(15)	BTL 3	Applying
3.	Write about the various filters in terms of their performance with necessary illustrations.	(15)	BTL 1	Remembering
4.	With necessary illustrations explain about the Fourier transform in frequency domain and the combining sinusoids of frequency content.	(15)	BTL 4	Analyzing
5.	Write in detail the following: i. Gray level transformation. ii. Color Image enhancement.	(7) (8)	BTL 1	Remembering

	UNIT III IMAGE RESTORATION			
	Image Restoration - Degradation model, Properties, Noise models – Mean Filters – Order Statistics – Adaptive filters – Band reject Filters – Band pass Filters – Notch Filters – Optimum Notch Filtering – Inverse Filtering – Wiener filtering.			
	PART A			
Q. No	Questions		BT Level	Competence
1.	Specify the factors that causes image degradation.		BTL 2	Understanding
2.	Write the equation for converting wiener filter into inverse filter.		BTL 3	Applying
3.	Classify order statistic filter.		BTL 4	Analyzing
4.	Mention the need of image restoration.		BTL 1	Remembering
5.	Identify the drawback of inverse filtering. How it can be overcome?		BTL 3	Applying
6.	What do you understand by Mexican Hat function?		BTL 1	Remembering
7.	Define blind image restoration.		BTL 1	Remembering
8.	List two applications of image restoration.		BTL 1	Remembering
9.	Why the restoration is called as unconstrained restoration?		BTL 4	Analyzing
10.	Classify the noise models involved in image restoration.		BTL 4	Analyzing
11.	List the various spatial restoration filter.		BTL 1	Remembering
12.	Sketch the image restoration model.		BTL 3	Applying
13.	Differentiate between Enhancement and Restoration.		BTL 2	Understanding
14.	Enumerate the various mean filters.		BTL 2	Understanding
15.	Summarize the Max and Min filter transfer functions.		BTL 2	Understanding
16.	Categorize spatial restoration filters.		BTL 3	Applying
17.	State the types of frequency domain restoration filters		BTL 3	Applying
18.	Write the types of Order statistics filters		BTL 4	Analyzing
19.	Introduce the three types of image degradation estimation models.		BTL 4	Analyzing
20.	Obtain the band pass filter transfer function from band reject filter.		BTL 4	Analyzing
21.	Brief about Gaussian noise model.		BTL 1	Remembering
22.	Outline about Rayleigh noise model.		BTL 2	Understanding
23.	Express the PDF expression for uniform noise.		BTL 2	Understanding
24.	How the arithmetic and geometric mean filters are differ?		BTL 3	Applying
	PART – B			
1.	(i)Discuss the concept of inverse and pseudo inverse filters for image restoration. (ii)What are spatial transformation techniques used for image restoration? Explain them in detail.	(7) (6)	BTL 2	Understanding
2.	Explain the algorithm for following filtering (i)Adaptive filtering, (ii)LMS filter.	 (7) (6)	BTL 3	Applying
3.	(i) What is the term Order statistics filter means? Classify it. (ii) Simplify the operations of order statistic filter.	(4) (9)	BTL 4	Analyzing
4.	Describe inverse filtering for removal of blur caused by any motion	(13)	BTL 1	Remembering

	and describe how it restore the image.			
5.	Derive a wiener filter for image restoration and specify its advantages over inverse filter.	(13)	BTL 3	Applying
6.	How Wiener filter is helpful to reduce the mean square error when image is corrupted by motion blur and additive noise.	(13)	BTL 4	Analyzing
7.	Explain the following with respect to image restoration. i. Band Pass filter, ii. Band stop filter, iii. Notch filter.	 (5) (4) (4)	BTL 2	Understanding
8.	i. Define image restoration, ii. Mention the importance of image restoration, iii. Draw the image degradation model and mention all the noise models involved in it.	(5) (4) (4)	BTL 1	Remembering
9.	Compare and contrast various noise PDF function.	(13)	BTL 4	Analyzing
10.	How the mean filters differs from each show it.	(13)	BTL 2	Understanding
11.	Describe constrained least square filtering for image restoration and derive its transfer function.	(13)	BTL 1	Remembering
12.	What is the term adaptive filter means, explain it with necessary equations.	(13)	BTL 1	Remembering
13.	Recommend an optimum methodology to reduce periodic noise explain the same in detail.	(13)	BTL 4	Analyzing
14.	With suitable expressions give the properties of all the noise models.	(13)	BTL 3	Applying
15.	Write note about the following: i. Optimum notch filtering, ii. Inverse Filtering, iii. Wiener filtering.	 (5) (4) (4)	BTL 2	Understanding
16.	Derive the expression for Optimum notch filtering	(13)	BTL 4	Analyzing
17.	Examine the various degradation function involved in restoration.	(13)	BTL 3	Applying
	PART-C			
Q.No	Questions		BT Level	Competence
1.	Explain the use of wiener filter or least mean square filter in image restoration.	(15)	BTL 2	Understanding
2.	Elaborate about Inverse filtering with necessary illustrations.	(15)	BTL 4	Analyzing
3.	Discuss in detail about frequency domain restoration filters with necessary diagrams.	(15)	BTL 1	Remembering
4.	Classify the spatial filtering techniques elaborate any two category in detail with suitable expressions.	(15)	BTL 3	Applying
5.	Draw the image degradation model, describe in detail about various noise models with appropriate equations.	(15)	BTL 1	Remembering

	UNIT IV IMAGE SEGMENTATION			
	Edge detection, Edge linking via Hough transform – Thresholding - Region based segmentation – Region growing – Region splitting and merging – Morphological processing- Erosion and Dilation, Segmentation by morphological watersheds – Basic concepts of Dam construction, Watershed segmentation algorithm.			
	PART A			
Q. No	Questions		BT Level	Competence
1.	Define Segmentation.		BTL 1	Remembering
2.	Write the applications of Segmentation.		BTL 1	Remembering
3.	List the three types of discontinuity in digital image.		BTL 1	Remembering
4.	Mention the properties of second derivative around an edge.		BTL 1	Remembering
5.	Name the different types of derivative filters.		BTL 1	Remembering
6.	Point out the principal applications of watershed segmentation.		BTL 1	Remembering
7.	Write the Sobel horizontal and vertical edge detection masks.		BTL 2	Understanding
8.	How are the derivatives obtained in edge detection during formulation?		BTL 2	Understanding
9.	What is meant by object point and background point?		BTL 2	Understanding
10.	State the problems in region splitting and merging based image segmentation.		BTL 2	Understanding
11.	Differentiate between local and global thresholding technique for image segmentation		BTL 2	Understanding
12.	Specify the steps involved in region splitting and merging.		BTL 2	Understanding
13.	Summarize the steps in edge linking problem based on Hough transform.		BTL 3	Applying
14.	Justify the need of morphological operations in image segmentation.		BTL 3	Applying
15.	Outline about thresholding and mention its types.		BTL 3	Applying
16.	Identify how to detect discontinuity in an image using segmentation.		BTL 3	Applying
17.	Enumerate the advantages and disadvantages of using more than one seed in a region growing technique.		BTL 3	Applying
18.	Outline the two types of region based segmentation.		BTL 3	Applying
19.	Examine the condition to be satisfied by the partitions in region-based segmentation.		BTL 4	Analyzing
20.	Mention the properties of the second derivative around an edge.		BTL 4	Analyzing
21.	Explain about gradient operator.		BTL 4	Analyzing
22.	Outline the three points used in the concept of watersheds in segmentation.		BTL 4	Analyzing
23.	What do you infer about catchment basins and divide lines in morphological watersheds?		BTL 4	Analyzing
24.	Analyze the necessary features of dam construction in watershed algorithm with necessary details.		BTL 4	Analyzing
	PART – B			

1.	(i) Mention the three types of gray level discontinuity in an image. (ii) Write in detail about point and line detection.	(3) (10)	BTL 1	Remembering
2.	Describe about edge detection with necessary illustrations and mathematical operators.	(13)	BTL 1	Remembering
3.	Write short notes on: (i) Edge Linking (ii) Boundary Detection	 (7) (6)	BTL 1	Remembering
4.	Explain in detail about edge linking using Hough transform.	(13)	BTL 1	Remembering
5.	With suitable examples explain region splitting and merging technique.	(13)	BTL 2	Understanding
6.	How edge detection is performed in digital images using (i) Laplacian operator. (ii) Sobel operator. (iii) Prewit operator	 (3) (3) (7)	BTL 2	Understanding
7.	With necessary steps write in detail about region growing algorithm in segmentation.	(13)	BTL 2	Understanding
8.	Outline in detail about the following: (i) Edge linking and boundary detection using local processing (ii) Global processing via Hough transform	 (6) (7)	BTL 4	Analyzing
9.	(i) What do you mean by optimal thresholding? In detail explain how do you obtain the adaptive threshold for an image with necessary illustrations? (ii) List the salient features of different types of thresholding.	(7) (6)	BTL 3	Applying
10.	Examine in detail about Morphological watersheds in segmentation with necessary illustrations.	(13)	BTL 3	Applying
11.	(i) What are the objectives of the image segmentation? (ii) Explain any one of the region-based image segmentation technique in detail. Mention two applications of image segmentation.	(3) (10)	BTL 1	Remembering
12.	(i) Point out the features of Catchment basins and divide lines in watershed algorithm. (ii) With necessary diagrams explain the construction of dams in watershed segmentation algorithm.	(6) (7)	BTL 3	Applying
13.	Examine the following terms (i) Region Splitting and merging. (ii) Erosion and Dilation.	 (6) (7)	BTL 4	Analyzing
14.	Define thresholding and explain the various methods of thresholding in detail.	(13)	BTL 3	Applying

15.	Explain with necessary diagrams the segmentation techniques that are based on finding the regions directly.	(13)	BTL 4	Analyzing
16.	How is line detected in an image? Describe with suitable operators the detection of horizontal, vertical and lines at ±45 degrees.	(13)	BTL 4	Analyzing
17.	What do you understand by dilation and erosion operation in morphological operation? Explain with necessary illustrations.	(13)	BTL 2	Understanding
	PART-C			
Q.No	Questions		BT Level	Competence
1.	Describe about region-based image segmentation techniques with necessary diagrams.	(15)	BTL 1	Remembering
2.	Examine in detail the following: (i) Detection of Discontinuity in an image (ii) Detection of similarity using region based techniques.	 (8) (7)	BTL 4	Analyzing
3.	Discuss in detail about the following: (i) Edge Linking and Boundary detection. (ii) Global processing via the Hough Transform	 (8) (7)	BTL 3	Applying
4.	(i) Write in detail about role of illumination in thresholding. (ii) With necessary illustrations explain Basic adaptive and optimal global thresholding.	(5) (10)	BTL 1	Remembering
5.	(i) Explain watershed algorithm with necessary fundamentals. (ii) Write in detail Application of Markers in segmentation.	(10) (5)	BTL 2	Understanding

	UNIT V IMAGE REPRESENTION AND RECOGNITION			
	Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, JPEG standard, MPEG. Boundary representation, Boundary description, Fourier Descriptor, Regional Descriptors – Topological feature, Texture - Patterns and Pattern classes - Recognition based on matching.			
	PART A			
Q.No	Questions		BT Level	Competence
1.	Rephrase the term ‘chain codes’.		BTL 1	Remembering
2.	Define length of a boundary.		BTL 1	Remembering
3.	How thinning or skeletonizing algorithm works?		BTL 1	Remembering
4.	Show the demerits of chain code.		BTL 1	Remembering
5.	Name the approaches used to specify image representation.		BTL 1	Remembering
6.	Write about the equation of diameter for boundary.		BTL 1	Remembering
7.	Discuss the various polygonal approximation methods.		BTL 2	Understanding
8.	Summarize polygonal approximation.		BTL 2	Understanding
9.	Short note on the term eccentricity and curvature of boundary.		BTL 2	Understanding
10.	Explain few boundary descriptors.		BTL 2	Understanding
11.	State the description of Fourier descriptors.		BTL 2	Understanding

12.	Categorize the types of regional descriptors.		BTL 4	Analyzing
13.	Specify about shape numbers.		BTL 2	Understanding
14.	Justify the measures used as simple descriptor.		BTL 3	Applying
15.	Develop the steps for Shape number in image segmentation?		BTL 3	Applying
16.	Classify the types of image representations.		BTL 4	Analyzing
17.	Discuss about compactness		BTL 3	Applying
18.	Point out the difference between structural and spectral approach.		BTL 4	Analyzing
19.	Identify the features of Fourier spectrum		BTL 3	Applying
20.	Describe Topological features?		BTL 4	Analyzing
21.	Define and explain gray level co occurance matrix		BTL 3	Applying
22.	Mention about pattern and pattern class		BTL 3	Applying
23.	Analyze training pattern and training set.		BTL 4	Analyzing
24.	Examine about statistical approach		BTL 4	Analyzing
	PART-B			
1.	Short note the concepts and approach of chain code, Boundary representation.	(13)	BTL 2	Understanding
2.	(i)Explain Polygonal approximation method. (ii)How the merging techniques applied in approximation and also develop the steps involved in approximation method.	(2) (11)	BTL 3	Applying
3.	Write about how tree approach is used to describe different regions of an image.	(13)	BTL 1	Remembering
4.	Explain the different types of boundary descriptors with suitable diagrams.	(13)	BTL 2	Understanding
5.	Justify the need for image compression. How run length encoding approach is used for compression? Is it lossy?	(13)	BTL 3	Applying
6.	Write in detail note about the following i)Textures ii)Shape numbers, iii)Fourier descriptors, iv)Pattern classes.	 (4) (3) (3) (3)	BTL 1	Remembering
7.	(i) Classify the Regional descriptors (ii) Examine the regional descriptors with basic diagrammatic representations.	(5) (8)	BTL 4	Analyzing
8.	Analyze a coder which a source emits letters from an alphabet A={k1,k2,k3,k4,k5} with probabilities P(k1)=p(k3)=0.2, P(k2)=0.4, P(k4)= P(k5)=0.1, entropy = 2.122bits/symbol. Find a Huffman code for this source and the average length of the code and its redundancy.	(13)	BTL 4	Analyzing
9.	(i)Summarize the decision theoretic methods for recognition (ii)State about the recognition based on matching method with equations.	(9) (4)	BTL 2	Understanding

10.	(i)Distinguish between losseless and lossy compression. (ii)Categorize image compression standard with its block diagram.	(6) (7)	BTL 4	Analyzing
11.	(i)Write in detail about the stages of MPEG image compression standard. (ii)Demonstrate block diagram of JPEG standard.	(7) (6)	BTL 2	Understanding
12.	i) State the different approaches of textures? (ii)Define the parameters of descriptors in image representation.	(7) (6)	BTL 1	Remembering
13.	Write the concepts of following methodologies (i)shape numbers (ii) Stastical moments. (iii)Simple boundary descriptors.	 (4) (5) (4)	BTL 1	Remembering
14.	(i)Classify the different methods of image representation. (ii)Analyze the properties of fourier descriptors. (iii)Analyze the different approaches of pattern and pattern classes.	(2) (4) (7)	BTL 4	Analyzing
15.	Solve and find a Huffman code and average length of the code and its redundancy for the source emits letters from an alphabet A={a1,a2,a3,a4,a5} with probabilities P(a1)==0.2, P(a2)=0.4, P(a3)=0.2, P(a4)=0.1 and P(a5)=0.1.	(13)	BTL 3	Applying
16.	Develop the tag for the sequence 1 3 2 1 for the probabilities P(1)=0.8, P(2)=0.02, P(3)=0.1813. How an image is compressed using JPEG Image compression standard?	(13)	BTL 3	Applying
17.	Write short notes on: (i)Arithmetic coding. (ii)JPEG standards.	 (7) (6)	BTL 1	Remembering
	PART – C			
1.	What is image compression? Explain any four variable length coding compression schemes.	(15)	BTL 1	Remembering
2.	Write about the various boundary descriptors in detail with neat diagram.	(15)	BTL 1	Remembering
3.	Summarize on the following image representation technique i) Chain code, ii) Polygonal approximation.	 (8) (7)	BTL 2	Understanding
4.	Analyze the different techniques for the representation of shapes in digital image. Explain the principle behind “Fourier Descriptor” based shape representation.	(15)	BTL 4	Analyzing
5.	Develop the block diagram of MPEG encoder and discuss its operation.	(15)	BTL 3	Applying