

SNS COLLEGE OF TECHNOLOGY (AN AUTONOMOUS INSTITUTION) COIMBATORE – 35.



DEPARTMENT OF BIOMEDICAL ENGINEERING

19BMB304 BIOMEDICAL IMAGE PROCESSING

MULTIPLE CHOICE QUESTIONS

UNIT -1

Topic – 1 Introduction – Origin

- 1. The spatial coordinates of a digital image (x,y) are proportional to:
- a) Position b) Brightness
- c) Contrast d) Noise

2. Among the following image processing techniques which is fast, precise and flexible.

- a) Optical **b) Digital**
- c) Electronic d) Photographic

3. An image is considered to be a function of a(x,y), where a represents:

- a) Height of image b) Width of image
- c) Amplitude of image d) Resolution of image
- 4. What is pixel?
- a) Pixel is the elements of a digital image
- b) Pixel is the elements of an analog image
- c) Pixel is the cluster of a digital image
- d) Pixel is the cluster of an analog image

5. The range of values spanned by the gray scale is called:

- a) Dynamic range b) Band range
- c) Peak range d) Resolution range

6. Which is a colour attribute that describes a pure colour?

a) Saturation **b) Hue**

c) Brightness d) Intensity

7. Which gives a measure of the degree to which a pure colour is diluted by white light?

a) Saturation	b) Hue
c) Intensity	d) Brightness

8. Which means the assigning meaning to a recognized object.

a) Interpretation	b) Recognition

c) Acquisition d) Segmentation

9. A typical size comparable in quality to monochromatic TV image is of size.

a) 256 X 256	b) 512 X 512
c) 1920 X 1080	d) 1080 X 1080

10. The number of grey values are integer powers of:

a) 4	b) 2
c) 8	d) 1

Topic – 2 Steps in Image Processing

1. What is the first and foremost step in Image Processing?

a) Image restoration b) Image enhancement

c) Image acquisition d) Segmentation

2. In which step of processing, the images are subdivided successively into smaller regions?

a) Image enhancement	h) Image acquisition	
a) mage enhancement	b) mage acquisition	
c) Segmentation	d) Wavelets	
3. What is the next step in image processing after compression?		
a) Wavelets	b) Segmentation	
c) Representation and description d) Morphological processing		
4. What is the step that is performed before color image processing in image processing?		
a) Wavelets and multi resolution p	rocessing b) Image enhancement	
c) Image restoration	d) Image acquisition	

5. How many number of steps are involved in image processing?

a) 10	b) 9
c) 11	d) 12

6. What is the expanded form of JPEG?

a) Joint Photographic Expansion Group**b) Joint Photographic Experts Group**

c) Joint Photographs Expansion Groupd) Joint Photographic Expanded Group

7. Which of the following step deals with tools for extracting image components those are useful in the representation and description of shape?

a) Segmentation	b) Representation & description
c) Compression	d) Morphological processing

8. In which step of the processing, assigning a label (e.g.,

its descriptors is done?	"vehicle") to an object based on
a) Object recognition	b) Morphological processing
c) Segmentation	d) Representation & description

9. What role does the segmentation play in image processing?

a) Deals with extracting attributes that result in some quantitative information of interest

b) Deals with techniques for reducing the storage required saving an image, or the bandwidth required transmitting it

c) Deals with partitioning an image into its constituent parts or objects

d) Deals with property in which images are subdivided successively into smaller regions

10. What is the correct sequence of steps in image processing?

a) Image acquisition->Image enhancement->Image restoration->Color image processing->Compression->Wavelets and multi resolution processing->Morphological processing->Segmentation->Representation & description->Object recognition

b) Image acquisition->Image enhancement->Image restoration->Color image processing->Wavelets and multi resolution processing->Compression->Morphological processing->Segmentation->Representation & description->Object recognition

c) Image acquisition->Image enhancement->Color image processing->Image restoration->Wavelets and multi resolution processing->Compression->Morphological processing->Segmentation->Representation & description->Object recognition

d) Image acquisition->Image enhancement->Image restoration->Color image processing->Wavelets and multi resolution processing->Compression->Morphological processing->Representation & description->Segmentation->Object recognition

Topic – 3 Visual Perception

1) The rods and cones in retina are responsible for ______ and _____ respectively

Topic - 4 Image Sensing and Acquisitions

1. The most familiar single sensor used for Image Acquisition is

a) Microdensitometer	b) Photodiode	

c) CMOS

d) None of the Mentioned

2. A geometry consisting of in-line arrangement of sensors for image acquisition

a) A photodiode	b) Sensor strips
c) Sensor arrays	d) CMOS

3. CAT in imaging stands for

a) Computer Aided Telegraphy

c) Computerised Axial Telegraphy

b) Computer Aided Tomography

d) Computerised Axial Tomography

4. The section of the real plane spanned by the coordinates of an image is called the

a) Spacial Domain	b) Coordinate Axes
c) Plane of Symmetry	d) None of the Mentioned

5. The difference is intensity between the highest and the lowest intensity levels in an image is _____

a) Noise	b) Saturation
c) Contrast	d) Brightness

6. ______ is the effect caused by the use of an insufficient number of intensity levels in smooth areas of a digital image.

a) Gaussian smooth	b) Contouring d)
c) False Contouring	Interpolation

7. The process of using known data to estimate values at unknown locations is called

a) Acquisition	b) Interpolation
c) Pixelation	d) None of the Mentioned

8. Which of the following is NOT an application of Image Multiplication?

- a) Shading Correction b) Masking
- c) Pixelation d) Region of Interest operations
- 9. The procedure done on a digital image to alter the values of its individual pixels is
- a) Neighbourhood Operations b) Image Registration
- c) Geometric Spacial Transformation
- d) Single Pixel Operation

10. In Geometric Spacial Transformation, points whose locations are known precisely in input and reference images.

a) **Tie points** b) Réseau points

c) Known points d) Key-points

Topic -5 Image Sampling

1. To convert a continuous sensed data into Digital form, which of the following is required?

a) Sampling b) Quantization

c) Both Sampling and Quantization d) Neither Sampling nor Quantization

2. To convert a continuous image f(x, y) to digital form, we have to sample the function in _____

a)	Coordinates	b)	Amplitude`
uj	Goorannates	0)	Implicade

c) All of the mentioned d) None of the mentioned

3. For a continuous image f(x, y), how could be Sampling defined?

a)	Digitizing the coordinate values	5 b)	Digitizing the amplitude values
c)	All of the mentioned	d)	None of the mentioned

4. For a continuous image f(x, y), Quantization is defined as

- a) Digitizing the coordinate values **b)** Digitizing the amplitude values
- c) All of the mentioned d) None of the mentioned

"5. Validate the statement:

For a given image in one-dimension given by function f(x, y), to sample the function we take equally spaced samples, superimposed on the function, along a horizontal line. However, the sample values still span (vertically) a continuous range of gray-level

values. So, to convert the given function into" a digital function, the gray-level values must be divided into various discrete levels.

a) True

b) False

6. How is sampling been done when an image is generated by a single sensing element combined with mechanical motion?

a) The number of sensors in the strip defines the sampling limitations in one direction and Mechanical motion in the other direction.

b) The number of sensors in the sensing array establishes the limits of sampling in both directions.

c) The number of mechanical increments when the sensor is activated to collect data.

d) None of the mentioned.

7. How does sampling gets accomplished with a sensing strip being used for image acquisition?

a) The number of sensors in the strip establishes the sampling limitations in one image direction and Mechanical motion in the other direction

b) The number of sensors in the sensing array establishes the limits of sampling in both directions

c) The number of mechanical increments when the sensor is activated to collect data

d) None of the mentioned

Topic -6 Image Quantization

1. A continuous image is digitised at _____ points.

a) random b) vertex

c) contour d) sampling

2. The transition between continuous values of the image function and its digital equivalent is called ______

a) Quantisation b) Sampling

c) Rasterisation d) None of the Mentioned

View Answer

3. Images quantised with insufficient brightness levels will lead to the occurrence of

a) Pixillation	b) Blurring
a) i minación	b) blaiting

c) False Contours d) None of the Mentioned

Explanation: This effect arises when the number brightness levels is lower that which the human eye can distinguish.

4. The smallest discernible change in intensity level is called ______

- a) Intensity Resolution b) Contour
- c) Saturation d) Contrast

5. What is the tool used in tasks such as zooming, shrinking, rotating, etc.?

a) Sampling	b) Interpolation
c) Filters	d) None of the Mentioned

6. The type of Interpolation where for each new location the intensity of the immediate pixel is assigned is _____

a) bicubic interpolation	b) cubic interpolation
c) bilinear interpolation	d) nearest neighbour interpolation

7. The type of Interpolation where the intensity of the FOUR neighbouring pixels is used to obtain intensity a new location is called ______

a) cubic interpolation b)) nearest neighbour interpolation
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c) bilinear interpolation d) bicubic interpolation

8. Dynamic range of imaging system is a ratio where the upper limit is determined by

- a) Saturation b) Noise
- c) Brightness d) Contrast

9. For Dynamic range ratio the lower limit is determined by

- a) Saturation b) Brightness
- c) Noise d) Contrast

10. Quantitatively, spatial resolution cannot be represented in which of the following ways

a) fine pairs	b) pixels
c) dots	d) none of the Mentioned
Topic -7Relationship bet	ween Pixels
1. In 4-neighbours of a pixe	el p, how far are each of the neighbours located from p?
a) one pixel apart	b) four pixels apart
c) alternating pixels	d) none of the Mentioned
2. If S is a subset of pixels, j between them consisting o	pixels p and q are said to be if there exists a path f pixels entirely in S.
a) continuous	b) ambiguous
c) connected	d) none of the Mentioned
3. If R is a subset of pixels,	we call R a of the image if R is a connected set.
a) Disjoint	b) Region
c) Closed	d) Adjacent
4. Two regions are said to be	if their union forms a connected set.
a) Adjacent	b) Disjoint
c) Closed	d) None of the Mentioned
ej diosed	-
View Answer	
View Answer 5. If an image contains K di represent?	isjoint regions, what does the union of all the regions
View Answer 5. If an image contains K di represent? a) Background	isjoint regions, what does the union of all the regions b) Foreground

a) Boundary	b) Border

c) Contour

d) All of the Mentioned

7. The distance between pixels p and q, the pixels have a distance less than or equal to some value of radius r centred at (x,y) is called :

a) Euclidean distance	b) City-Block distance
c) Chessboard distance	d) None of the Mentioned

8. The distance between pixels p and q, the pixels have a distance less than or equal to some value of radius r, form a diamond centred at (x,y) is called :

a) Euclidean distance	b) Chessboard distance
c) City-Block distance	d) None of the Mentioned

9. The distance between pixels p and q, the pixels have a distance less than or equal to some value of radius r, form a square centred at (x,y) is called :

a) Euclidean distance	b) Chessboard distance
c) City-Block distance	d) None of the Mentioned
View Answer	

10.	Which	of the	following	g is NO'	Г is not a	type	of Adia	cencv?
T 0.		01 0110	1011011112	,	10 1100 4	590	orraja	concy.

a) 4-Adjacency	b) 8-Adjacency
c) m-Adjacency	d) None of the Mentioned

Topic - 8 Color Models

- 1. Color model is also named as (another name):
- a) Color spaceb) Color gapc) Color space & color systemd) Color system
- 2. What do you mean by the term pixel depth?

a) It is the number of bits used to represent each pixel in RGB space

b) It is the number of bytes used to represent each pixel in RGB space

c) It is the number of units used to represent each pixel in RGB space

d) It is the number of mm used to represent each pixel in RGB space

3. How many bit RGB color image is represented by full-color image?

a) 32-bit RGB color image b) 24-bit RGB color image

c) 16-bit RGB color image d) 8-bit RGB color image

4. What is the equation used to obtain S component of each RGB pixel in RGB color format?

a) S=1+3/(R+G+B) [min(R,G,B)]. b) S=1+3/(R+G+B) [max(R,G,B)]. c)

S=1-3/(R+G+B) [max(R,G,B)]. d) S=1-3/(R+G+B) [min(R,G,B)].

5. What is the equation used to obtain I(Intensity) component of each RGB pixel in RGB color format?

a) I=1/2(R+G+B)

b) I=1/3(R+G+B)

c) I=1/3(R-G-B)

d) I=1/3(R-G+B)

View Answer

6. What is the equation used for obtaining R value in terms of HSI components?
a) R=I[1-(S cosH)/cos(60°-H)]. b) R=I[1+(S cosH)/cos(120°-H)].
c) R=I[1+(S cosH)/cos(60°-H)]. d) R=I[1+(S cosH)/cos(30°-H)].

7. What is the equation used for calculating B value in terms of HSI components?

a) B=I(1+S) b) B=S(1-I) c) B=S(1+I) d) B=I(1-S)



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DEPARTMENT OF BIOMEDICAL ENGINEERING

16BM324 BIOMEDICAL IMAGE PROCESSING

MULTIPLE CHOICE QUESTIONS

UNIT – 2

Topic – Spatial Domain – Transformation

1. Which of the following expression is used to denote spatial domain process?

a) g(x,y)=T[f(x,y)]	b) f(x+y)=T[g(x+y)]
c) g(xy)=T[f(xy)]	d) g(x-y)=T[f(x-y)]

2. Which of the following shows three basic types of functions used frequently for image enhancement?

a) Linear, logarithmic and inverse law	b) Power law, logarithmic and inverse law
c) Linear, logarithmic and power law	d) Linear, exponential and inverse law

3. Which expression is obtained by performing the negative transformation on the negative of an image with gray levels in the range[0,L-1]?

a) s=L+1-r	b) s=L+1+r
c) s=L-1-r	d) s=L-1+r

4. What is the general form of representation of log transformation?

a) $s=clog_{10}(1/r)$	b) s=clog10(1+r)
c) s=clog10(1*r)	d) s=clog10(1-r)

5. What is the general form of representation of power transformation?

a) s=cr ^γ	b) c=srγ
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c) s=rc d) s=

6. What is the name of process used to correct the power-law response phenomena?

a) Beta correctionb) Alpha correctionc) Gamma correctiond) Pie correction

7. Which of the following transformation function requires much information to be specified at the time of input?

a) Log transformation	b) Power transformation

d) Linear transformation

8. In contrast stretching, if r1=s1 and r2=s2 then which of the following is true?

a) The transformation is not a linear function that produces no changes in gray levels

b) The transformation is a linear function that produces no changes in gray levels

c) The transformation is a linear function that produces changes in gray levels

d) The transformation is not a linear function that produces changes in gray levels View Answer

9. In contrast stretching, if r1=r2, s1=0 and s2=L-1 then which of the following is true?

a) The transformation becomes a thresholding function that creates an octal image

b) The transformation becomes a override function that creates an octal image

c) The transformation becomes a thresholding function that creates a binary image

d) The transformation becomes a thresholding function that do not create an octal image

10. In contrast stretching, if $r1 \le r2$ and $s1 \le s2$ then which of the following is t

a) The transformation function is double valued and exponentially increasing

b) The transformation function is double valued and monotonically increasing

c) The transformation function is single valued and exponentially increasing

d) The transformation function is single valued and monotonically increasing

11. In which type of slicing, highlighting a specific range of gray levels in an image often is desired?

a) Gray-level slicing	b) Bit-plane slicing
c) Contrast stretching	d) Byte-level slicing

12. Which of the following depicts the main functionality of the Bit-plane slicing?

a) Highlighting a specific range of gray levels in an image

b) Highlighting the contribution made to total image appearance by specific bits

- c) Highlighting the contribution made to total image appearance by specific byte
- d) Highlighting the contribution made to total image appearance by specific pixels

Topic - 2 Histogram Processing

1. What is the method that is used to generate a processed image that have a specified histogram?

- a) Histogram linearization
- b) Histogram equalization

c) Histogram matching

d) Histogram processing

2. Histograms are the basis for numerous spatial domain processing techniques.

- a) True
- b) False

3. In a dark image, the components of histogram are concentrated on which side of the grey scale?

a) High b) Medium

c) Low	d) Evenly distributed
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4. What is the basis for numerous spatial domain processing techniques?

a) Transformations	b) Scaling
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c) Histogram d) None of the Mentioned

12. In _____ image we notice that the components of histogram are concentrated on the low side on intensity scale.

a) bright	b) dark	
c) colourful	d) All of the Mentioned	

5. What is Histogram Equalisation also called as?

c) Histogram linearization	d) None of the Mentioned
a) Histogram Matching	b) Image Enhancement

6. What is Histogram Matching also called as?

a) Histogram Equalisation	b) Histogram Specification
c) Histogram linearization	d) None of the Mentioned

7. Histogram Equalisation is mainly used for _____

- a) Image enhancement b) Blurring
- c) Contrast adjustment d) None of the Mentioned

8. To reduce computation if one utilises non-overlapping regions, it usually produces ______ effect.

a) Dimming b) Blurred

c) Blocky	d) None of the Mentioned
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9.	What	does	SEM	stands	for?
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a) Scanning Electronic Machine	b) Self Electronic Machine
c) Scanning Electron Microscope	d) Scanning Electric Machine

10. The type of Histogram Processing in which pixels are modified based on the intensity distribution of the image is called _____.

- a) Intensive b) Local
- c) Global d) Random

11. Which type of Histogram Processing is suited for minute detailed enhancements?

a) Intensive	b) Local	

c) Global d) Random

12. In uniform PDF, the expansion of PDF is		
a) Portable Document Format	b) Post Derivation Function	

c) Previously Derived Function d) Probability Density Function

Topic – 3 Basics of Spatial Filtering

1. What is accepting or rejecting certain frequency components called as?

- a) Filtering b) Eliminating
- c) Slicing d) None of the Mentioned

2. A filter that passes low frequencies is _____

- a) Band pass filter b) High pass filter
- c) Low pass filter d) None of the Mentioned

3. What is the process of moving a filter mask over the image and computing the sum of products at each location called as?

a) Convolution	b) Correlation
c) Linear spatial filtering	d) Non linear spatial filtering

View Answer

4. The standard deviation controls ______ of the bell (2-D Gaussian function of bell shape).

- a) Size b) Curve
- c) Tightness d) None of the Mentioned

5. What is required to generate an M X N linear spatial filter?

- a) **MN mask coefficients** b) M+N coordinates
- c) MN spatial coefficients d) None of the Mentioned
- 6. What is the difference between Convolution and Correlation?
- a) Image is pre-rotated by 180 degree for Correlation

b) Image is pre-rotated by 180 degree for Convolution

- c) Image is pre-rotated by 90 degree for Correlation
- d) Image is pre-rotated by 90 degree for Convolution

7. Convolution and Correlation are functions of _____

- a) Distance b) Time
- c) Intensity d) Displacement
- 8. The function that contains a single 1 with the rest being 0s is called ______
- a) Identity function b) Inverse function
- c) Discrete unit impulse d) None of the Mentioned
- 9. Which of the following involves Correlation?
- a) Matching b) Key-points
- c) Blobs d) None of the Mentioned.
- 10. An example of a continuous function of two variables is _____

a) Impulse Function b) Intensity function

c) Contrast stretching d) Gaussian function

Topic -4 Smoothening Filters

1. Noise reduction is obtained by blurring the image using smoothing filter.

a) True b) False

2. What is the output of a smoothing, linear spatial filter?

a) Median of pixels b) Maximum of pixels

c) Minimum of pixels d) Average of pixels

3. Smoothing linear filter is also known as median filter.

- a) True **b) False**
- 4. Which of the following in an image can be removed by using smoothing filter?
- a) Smooth transitions of gray levels b) Smooth transitions of brightness levels
- c) Sharp transitions of gray levels d) Sharp transitions of brightness levels
- 5. Which of the following is the disadvantage of using smoothing filter?
- a) Blur edges b) Blur inner pixels
- c) Remove sharp transitions d) Sharp edges

6. Smoothing spatial filters doesn t smooth the false contours.

a) True **b) False** 7. The mask shown in the figure below belongs to which type of filter?



a) Sharpening spatial filter

b) Median filter

c) Sharpening frequency filter

8. The mask shown in the figure below belongs to which type of filter?



a) Sharpening spatial filterb) Median filterc) Smoothing spatial filterd) Sharpening frequency filter

9. Box filter is a type of smoothing filter.

a) True b) False

10. If the size of the averaging filter used to smooth the original image to first image is 9, then what would be the size of the averaging filter used in smoothing the same original picture to second in second image?



11. Which of the following comes under the application of image blurring?

a) Object detection	b) Gross representation

c) Object motion d) Image segmentation

12. Which of the following filters response is based on ranking of pixels?

a) Nonlinear smoothing filters b) Linear smoothing filters

c) Sharpening filters	d) Geometric mean filter
13. Median filter belo	ongs to which category of filters?
a) Linear spatial filte	r b) Frequency domain filter
c) Order static filte	r d) Sharpening filter
14. Median filters are	e effective in the presence of impulse noise.
a) True	b) False
Topic – 5	Sharpening Filters
1. Which of the	following is the primary objective of sharpening of an image?
a) Blurring the image	b) Highlight fine details in the image
c) Increase the brigh	tness of the image d) Decrease the brightness of the image
2. Image sharpening	process is used in electronic printing.
a) True	b) False
3. In spatial domain, sharpening the imag	which of the following operation is done on the pixels in e?
a) Integration	b) Average
c) Median	d) Differentiation
4. Image differentiati pixels with slow vary	on enhances the edges, discontinuities and deemphasizes the ving gray levels.

a) True b) False

5. In which of the following cases, we wouldn t worry about the behaviour of sharpening

filter?	,
a) Flat segments	b) Step discontinuities

c) Ramp discontinuities d) Slow varying gray values

6. Which of the following is the valid response when we apply a first derivative?

- a) Non-zero at flat segments b) Zero at the onset of gray level step
- c) Zero in flat segments d) Zero along ramps

7. Which of the following is not a valid response when we apply a second derivative?

a) Zero response at onset of gray level step

b) Nonzero response at onset of gray level step

c) Zero response at flat segments

d) Nonzero response along the ramps

8. If f(x,y) is an image function of two variables, then the first order derivative of a one dimensional function, f(x) is:

a) f(x+1)-f(x)	b) f(x)-f(x+1)
c) f(x-1)-f(x+1)	d) f(x)+f(x-1)

9. Isolated point is also called as noise point.

a) True b) False

10. What is the thickness of the edges produced by first order derivatives when compared to that of second order derivatives?

a) Finer b) Equal

c) Thicker

d) Independent



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16BM324 BIOMEDICAL IMAGE PROCESSING MULTIPLE CHOICE QUESTIONS

UNIT – 4

1. 1. Wavelet seri	es equation i	s sum of	
a) scaling coeff	icient	b) detail coefficient	
c) span coeffici	ent	d) Both A and B	
2. MRA stands for			
a) Multiresolut	ion analysis	b) Multiresolu	tion assembly
c) Multiresemb	le analysis	d) Multiresem	ble assembly
 Decomposing in a) low coding 	mage into ba	nd limit components i b) high coding	s called
c) intense codi	ng	d) subband co	ding
4. Which are uniq	uely decoda	ble codes?	
a) Fixed length	codes	b) Variable length coc	les
c) Fixed & Vari	able length c	odes d) None of the	mentioned
5. Huffman coding	g is an encod	ing algorithm used for	
a) Broadband s	systems	b) files greater	than 1 Mbit
c) Lossless data	a compressio	n d) Lossy data d	compression
1. Information	is the		
a) Data		c) meaningful data	
c) raw data		d) Both A and B	
Without losing quality	, JPEG-2000	can achieve compress	ion ratios of
a) 2:1		b) 20:1	
c) 2000:1		d) 200:1	

3. The best visual compression quality is achieved using

a) DCT b) Wavelets

- c) Fourier transform d) Dolby
- 4. Huffman coding is an encoding algorithm used for

a) Broadband systems	b) files greater than 1 Mbit

- c) Lossless data compression d) Lossy data compression
- 5. Replication of pixels is called

a) coding redundancy	b) spatial redundancy
c) temporal redundancy	d) both b and c

1. Which achieves greater compression?

a) Lossless coding	b) Lossy coding
c) Lossless & Lossy coding	d) None of the mentioned

- 2. A code is a mapping from
- a) Binary sequence to dicrete set of symbols
- b) Discrete set of symbols to binary sequence
- c) Both of the mentioned
- d) None of the mentioned
- 3. Which are uniquely decodable codes?
- a) Fixed length codes b) Variable length codes
- c) Fixed & Variable length codes d) None of the mentioned
- 4. 10. Entropy of a random variable is
- a) 0 b) 1
- c) Infinite d) Cannot be determined

5. Which of the following uses lossless compression ?

a) Sound

b) Images

c) Text

UNIT – 5

1. Which of the following of a boundary is defined as the line perpendicular to the major axis?

d) None of the Above

- a) Equilateral axis b) Equidistant axis
- c) Minor axis d) Median axis
 - 2. Which of the following is the useful descriptor of a boundary, whose value is

given by the ratio of length of the major axis to the minor axis?

- a) Radius b) Perimeter
- c) Area d) Eccentricity

3. What does the total number of pixels in the region defines?

- a) Perimeter b) Area
- c) Intensity d) Brightness

4. Fourier descriptors is insensitive to

a) Rotational invariance b) Translational Invariance

- c) Shift invariance d) Nonlinearity
 - 5. Based on the 4-directional code, the first difference of smallest magnitude is called as:
 - a) Shape number b) Chain number
 - c) Difference d) Difference number
 - 6. The term, Curvature is defined as
 - a. Rate of change of area b) Rate of change of slope
 - c) Slope d) Rate of change of diameter
- 7 . On which of the following operation of an image, the topology of the region changes?
- a) Stretching b) Rotation
- c) Folding d) Change in distance measure
- 8. Which of the following is the useful descriptor of a boundary, whose value is given by the ratio of length of the major axis to the minor axis?
- a) Radius b) Perimeter

c) Area

d) Eccentricity

- 9. What is the order of the shape number of a rectangular boundary with the dimensions of 3×3?
- a) 3 b) 6
- c) 9 d) 12
- 10 . Which of the following measures are not used to describe a region?
- a) Mean and median of grey values
- b) Minimum and maximum of grey values

c) Number of pixels alone

- d) Number of pixels above and below mean
- 11. What is the Euler number of a region with polygonal network containing

V,Q and F as the number of vertices, edges and faces respectively?

a) V+O+F	b) V-O+F
aj v · Q · I	0) V Q 1

- c) V+Q-F d) V-Q-F
- 12. What is the Euler number of the region shown in the figure below?

