Sample Questions

Department of Information Technology (**R-2019 Scheme)**

Subject Name: Image Processing **Semester: VI**

Multiple Choice Question Bank

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which is the foremost step in Image Processing?
Option A:	Morphological Processing
Option B:	Image acquisition
Option C:	Segmentation
Option D:	Compression
2.	Digitizing the coordinate values of a continuous image is called
Option A:	Compression
Option B:	Sampling
Option C:	Quantization
Option D:	Segmentation
3.	For coordinates p(3,4)the 4 neighbors of pixel p are
Option A:	(3,3)(2,3)(1,3)(1,3)
Option B:	(4,4)(3,5)(2,4)(3,3)
Option C:	(3,3)(2,3)(4,4)(2,2)
Option D:	(3,3)(2,4)(3,5)(2,1)
4.	The sum of all components of a normalized histogram will be
Option A:	1
Option B:	2
Option C:	0
Option D:	-1
5.	Which of the following is not an order static filter used for smoothing in spatial domain.
Option A:	Median filter
Option B:	Averaging filter
Option C:	Max / Maximum filter
Option D:	Min / Minimum filter

6.	Which transformation can be used for enhancing an image with white and gray detail embedded in dark regions of the image, especially when there is more black area in the image.
Option A:	Log transformations
Option B:	Power-law transformations
Option C:	Negative transformations
Option D:	Contour
7.	Which is a simple image enhancement technique that attempts to improve the contrast in an image by `stretching' the range of intensity values it contains to span a desired range of values.
Option A:	Contouring stretching
Option B:	Contrast stretching
Option C:	Mask processing
Option D:	Point stretching
8.	Which is a two-dimensional coordinate system in which each point on a plane is determined by a distance from a reference point and an angle from a reference direction.
Option A:	Cartesian coordinate system
Option B:	Rectangular coordinate system
Option C:	Polar coordinate system
Option D:	Value coordinate system
9.	Digitizing the coordinate values of a continuous image is called
Option A:	Compression
Option B:	Sampling
Option C:	Quantization
Option D:	Segmentation
10.	The operations on single pixels of a digital image is called
Option A:	Point Operation
Option B:	Diagonal Pixel Operation
Option C:	Value Transformation
Option D:	Neighbours pixel Operation
11.	What is the full form of CDF?
Option A:	Cumulative density function
Option B:	Contour derived function
Option C:	Cumulative distribution function

Option D:	Contour distribution function
12.	State the type of transformation that expands the value of dark pixels while compressing the higher-level values.
Option A:	Log transformations
Option B:	Inverse-log transformations
Option C:	Negative transformations
Option D:	Point transformations
13.	State an image Enhancement techniques that uses a function of values of f(input image) in a predefined neighborhood of (x, y) to determine the value of g(output image) at (x, y).
Option A:	Contouring
Option B:	Contrast stretching
Option C:	Mask processing
Option D:	Point processing
14.	Which is a simple image enhancement technique that attempts to improve the contrast in an image by `stretching' the range of intensity values it contains to span a desired range of values.
Option A:	Contouring stretching
Option B:	Contrast stretching
Option C:	Mask processing
Option D:	Point stretching
15.	Which of the following is not the property of 2D Discret Fourier Transform
Option A:	Separability
Option B:	Periodicity
Option C:	Operability
Option D:	Conjugate
16.	Choose the correct statement considering the feature of reciprocal relationship of filter in spatial domain and corresponding filter in frequency domain along with convolution
Option A:	The narrower the frequency domain filter more severe is the ringing
Option B:	The wider the frequency domain filter more severe is the ringing
Option C:	The narrower the frequency domain filter less severe is the ringing
Option D:	The wider the frequency domain filter less severe is the ringing
17.	Choose the correct statement regarding the number of computations required for computing an N-point DFT?
Option A:	N2 complex subtraction and N(N-1) complex multiplications

Option B:	N2 complex multiplications and N(N-1) complex additions
Option C:	N2 complex multiplications and N(N-1) complex division
Option D:	N2 complex additions and N(N+1) complex multiplications
18.	Which of the following is not edge detection operator
Option A:	Prewitt operator
Option B:	Robert operator
Option C:	Sobel operator
Option D:	Boundary operator
19.	Which of the following is not a discontinuity based on image segmentation
Option A:	Points
Option B:	Lines
Option C:	Circles
Option D:	Edges
20.	Categorising a pixel as per the range of values in which a pixel lies is called
Option A:	Region based segmentation
Option B:	Thresholding based segmentation
Option C:	Line based segmentation
Option D:	Edge based segmentation
21.	The 2D Fourier transform and it's inverse are
Option A:	infinitely nonlinear
Option B:	infinitely aperiodic
Option C:	infinitely linear
Option D:	infinitely periodic
22.	Fourier series is
Option A:	The sum of cosines and sines coefficient multiplied
Option B:	The sum of cosines and tan coefficient multiplied
Option C:	The difference of tan and sines coefficient multiplied
Option D:	The sum of cosines and sines coefficient division
23.	Choose the correct statement regarding the number of computations required for computing an N-point DFT?
Option A:	N2 complex subtraction and N(N-1) complex multiplications
Option B:	N2 complex multiplications and N(N-1) complex additions

Option C:	N2 complex multiplications and N(N-1) complex division
Option D:	N2 complex additions and N(N+1) complex multiplications
24.	With which of the following, the gradient is combined for edge detection
Option A:	area
Option B:	set theory
Option C:	line
Option D:	thresholding
25.	Which of the following is not region based segmentation technique
Option A:	Region Growing
Option B:	Split and merge
Option C:	Region Splitting
Option D:	Region mask
26.	Which is a powerful technique for finding straight lines, and other parametrized shapes, in images.
Option A:	Hough Transform
Option B:	Histogram equalization
Option C:	Shape identification
Option D:	Line identification
27.	Choose the correct statement regarding the number of computations required for computing an N-point DFT?
Option A:	N2 complex subtraction and N(N-1) complex multiplications
Option B:	N2 complex multiplications and N(N-1) complex additions
Option C:	N2 complex multiplications and N(N-1) complex division
Option D:	N2 complex additions and N(N+1) complex multiplications
28.	The starting pixel of region growing process is called
Option A:	base pixel
Option B:	seed pixel
Option C:	original pixel
Option D:	image
29.	Mask for horizontal line detection is
Option A:	[-1 -1 -1; 2 2 2; -1 -1 -1]
Option B:	[2 -1 -1; -1 2 -1; -1 -1 2]
Option C:	[1 2 -1; -1 2 -1; 1 2 -1]

Option D:	[-1 -1 2; -1 2 -1; 2 -1 -1]
30.	Which of these is second order derivative operator for edge detection.
Option A:	Sobel operator
Option B:	Prewitt operator
Option C:	Robert operator
Option D:	Laplacian Operator

Descriptive Question Bank

Q No	10 marks each
1	Perform Histogram Equalization for the following. Obtain a plot of original as well as equalized histogram. *GrayLevel* : 0 1 2 3 4 5 6 7 *Frequency*: 60 0 10 1110 320 80 0 20
2	Define the following with example: (i) Euclidean Distance (ii) City Block Distance (iii) Chess Board Distance (iv) m connectivity
3	What are the elements of digital image processing systems? Explain with a diagram.
4	Explain the different steps in digital image processing.
5	Explain Mask Processing Techniques with example.
6	Explain Point Processing Techniques with example.
7	Explain Region based segmentation
8	Explain DCT and its properties? Find the DCT for the following image: 2 4 4 2 4 6 8 3 2 8 10 4 3 8 6 2
9	Explain with suitable example the LZW coding and decoding technique for image compression.

10	Illustrate Arithmetic Coding and Decoding.
11	Apply horizontal and vertical line detection mask on the following image F. Use appropriate threshold value. Assume virtual rows and column by repeating border pixel values. $F = \begin{bmatrix} 6 & 5 & 10 \\ 100 & 100 & 100 \\ 4 & 20 & 10 \end{bmatrix}$
12	Write short notes on A) Fourier Descriptor B) Moments C) Shape Numbers D) Hit-or-Miss Transformation.
13	Explain the following operations: (i) Erosion (ii) Dilation (iii) Opening (iv) Closing
14	Explain with example the following: (i) Thining (i) Thickening
15	Give the following mask of size 3x3 and explain their usefulness in image processing. (i) Sobel Operator (ii) Prewitt Operator (iii) High Pass Filter

Q No	**5 marks each**
1	Explain the High Boost Filter.
2	Justify/Contradict the statements. (A) Enhancement process does not change the information content of image.
3	Justify/Contradict following statements. (A) For digital image having salt pepper noise, median filter is the best filter.
4	Justify/ Contrast the statement: The 0th (LSB) plane of the bit plane slicing contains hight frequency information of the image.
5	Justify/ Contrast the statement: Image subtraction is used for scene matching and detection.
6	Explain the High Boost Filter.
7	Define and Distinguish the Sampling and Quantization.
8	Write short notes on A) Image Resolution B) Spatial Resolution
9	Differentiate between Spatial Resolution and Tonal Resolution.
10	What do you mean by Sampling? What are the different types of Sampling?
11	Justify/ Contrast the statement: Convolution in spatial domain is multiplication in Fourier domain.
12	Explain Periodicity and Symmetric property of DFT.
13	Distinguish between lossless and lossy compression technique.

14	Explain in brief Hough Tranform.
15	Obtain the four directional Chain Code and Shape number representation of the following image:
16	Justify/ Contrast the statement: Shape number uniquely describes an object.

—X—X—