Program:**Computer Engineering**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: CSC701 and Course Name: Digital Signal and Image Processing (DSIP)

Time: 2 hour   Max. Marks: 80

Sample Question Paper

Objective Section	
Q1. Choose the correct option for following questions. All the Questions are compulsory and carry equal marks	
Question 1	A signal x[n] is anti symmetric or odd when
Option A:	x[-n] = x[n] • x[n]
Option B:	x[n] = -x[n]
Option C:	x[n] = [x[n]]2
Option D:	x[-n] = -x[n]
Question 2	The discrete impulse function is defined by
Option A:	δ(n) = 1, n ≥ 0 = 0, n ≠ 1
Option B:	δ(n) = 1, n = 0 = 0, n ≠ 0
Option C:	δ(n) = 1, n ≤ 0 = 0, n ≠ 1
Option D:	. δ(n) = 1, n ≤ 0 = 0, n ≥ 1
Question 3	System is said to be linear if it satisfies ………….
Option A:	Parseval's theorem
Option B:	Superposition Principle
Option C:	Sampling Theorem
Option D:	Correlation
Question 4	The process of converting discrete-time continuous valued signal into discrete-time discrete valued(digital) signal is known as:
Option A:	Sampling
Option B:	Quantization
Option C:	Coding
Option D:	Derivation

Question 5	IIR and FIR systems stand for
Option A:	Infinite Impulse Response and Finite Impulse Response
Option B:	Infinite Impulse Request and Finite Impulse Response
Option C:	Infinite Impulse Response and Finite Impulse Request
Option D:	Infinite Impulse Request and Finite Impulse Request
Question 6	The overlap save method is used to calculate
Option A:	The discrete convolution between a sampled signal and a finite impulse response (FIR) filter
Option B:	The discrete convolution between a sampled signal and an infinite impulse response (IIR) filter
Option C:	The discrete convolution between a very long signal and a finite impulse response (FIR) filter
Option D:	The discrete convolution between a very long signal and a infinite impulse response (IIR) filter
Question 7	By symmetry property of Discrete Fourier Transform, for N point real valued sequence if x(n)->X(K) then, X(K) = ?
Option A:	X*(N-K)
Option B:	X*(K)
Option C:	X(K+1)
Option D:	X(K)
Question 8	DTFT is the representation of
Option A:	Periodic Discrete time signals
Option B:	Aperiodic continuous signals
Option C:	Periodic continuous signals
Option D:	Aperiodic Discrete time signals
Question 9	Which of the following property makes it possible to calculate 2D DFT using 1D DFT?
Option A:	conjugate symmetry
Option B:	Separability
Option C:	Time shift
Option D:	Periodicity
Question 10	How many complex additions are required to be performed in linear filtering of a sequence using FFT algorithm?
Option A:	(N/2)logN
Option B:	2Nlog2N
Option C:	(N/2)log2N
Option D:	Nlog2N

Question 11	Two pixels p and q having gray values from V, the set of gray-level values used to define adjacency, are m-adjacent if:
Option A:	If q is in N4(p) OR q is in ND(p) and the set N4 (p) âˆ© N4 (q) has no pixels whose values are from V
Option B:	If q is in N8 (p) OR q is in ND (p) and the set N8 (p) âˆ© N8 (q) has no pixels whose values are from V
Option C:	If q is in N4 (p) OR q is in ND (p) and the set N4(p) âˆ© N4 (q) has pixels whose values are from V
Option D:	If q is in N8 (p) OR q is in ND (p) and the set N8 (p) âˆ© N8 (q) has pixels whose values are from V
Question 12	The result of the application of thresholding operation with T=3 at a pixel p with gray value 5 of a 4 bpp is
Option A:	15
Option B:	7
Option C:	255
Option D:	0
Question 13	The result of applying Intensity level slicing with background operation for r1=3 and r2=9 at pixel p with gray value 5 of 4 bpp is
Option A:	0
Option B:	15
Option C:	255
Option D:	7
Question 14	With _____ we can pass some of the backgrounds along with the high-frequency content.
Option A:	High pass filtering
Option B:	Low pass filtering
Option C:	High boost filtering
Option D:	Median filtering
Question 15	In the digital image of M rows and N columns and L discrete gray levels, calculate the bits required to store a digitized image for M=N=32 and L=8.
Option A:	16384
Option B:	4096
Option C:	8192
Option D:	3072
Question 16	What would be the effect on the histogram if we set higher-order bit planes to zero?
Option A:	Image becomes bright
Option B:	Image becomes low constrast

Option C:	Image becomes high constrast
Option D:	Image becomes dark
Question 17	Using which image format the quality of the image will be very good but storage will be large?
Option A:	JPEG
Option B:	BMP
Option C:	TIFF
Option D:	GIF
Question 18	If a component of the histogram is concentrated on the low side of the gray scale it is a histogram of
Option A:	Dark Image
Option B:	Bright Image
Option C:	Low constrast image
Option D:	High constrast image
Question 19	Which image processing techniques used to improve the overall appearance of an image for the human observer
Option A:	Compression
Option B:	Enhancement
Option C:	Segmentation
Option D:	Analysis
Question 20	Which filter is best to remove salt and pepper noise?
Option A:	Low pass
Option B:	Sobel
Option C:	Median
Option D:	Laplacian

Q2 **(20 Marks Each)**	**Solve any Four out of Six** **5 marks each**
A	Write a note on distance measure
B	Write a note on dynamic range compression
C	Explain segmentation based on image discontinuities

D	Justify that Median filter is best to remove salt and pepper noise
E	Write a note on distance measure
F	Perform contrast stretching operation with r1=4, r2=12, s1=8, and s2=12, for the given image | 4	5	9	14
4	6	11	14
3	6	5	11
3	8	8	9	

Q3. **(20 Marks Each)**	**Solve any Two Questions out of Three each** **10 marks**
A	If x(n)={2,2,3,1,4,5,6} obtain the following x(-n), x(n-1), x(n+1), x(-n+2), x(2n). Draw graph for each obtained new signal.
B	If x(n)={3,4,0,6}, find DFT X(K). Using obtained results not otherwise find DFT of the following sequences x1(n)={6,3,4,0}
C	Find the DFT of the 8 point causal sequence using Radix 2 DIT-FFT x(n)={2, 1, 2, 1, 1, 2, 1, 2}