University of Mumbai
Examination 2020

Program: Electronics Engineering
Curriculum Scheme: Rev 2012
Examination: Third Year Semester VI
Course Code: EXC605 and Course Name: Digital Signal Processing and Processors
Time: 1 hour Max. Marks: 50

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For the students:- All the Questions are compulsory and carry equal marks .

Q1.	x(n)*δ(n-k) =?
Option A:	x(n)
Option B:	x(k)
Option C:	x(k)*δ(n-k)
Option D:	x(k)*δ(k)
Q2.	What is the cross correlation sequence of the following sequences? x(n)= {....0,0,2, -1,3,7,1,2, -3,0,0....} y(n)= {....0,0,1, -1,2, -2,4,1, -2,5,0,0....}
Option A:	{10,9,19,36, -14,33,0,7,13, -18,16,7,5, -3}
Option B:	{10, -9,19,36, -14,33,0,7,13, -18,16, -7,5, -3}
Option C:	{10,9,19,36,14,33,0, -7,13, -18,16, -7,5, -3}
Option D:	{10, -9,19,36, -14,33,0, -7,13,18,16,7,5, -3}
Q3.	The impulse response of a LTI system is h(n)= {1,1,1}. What is the response of the signal to the input x(n)= {1,2,3}?
Option A:	{1,3,6,3,1}
Option B:	{1,2,3,2,1}
Option C:	{1,3,6,5,3}
Option D:	{1,1,1,0,0}
Q4.	The output signal when a signal x(n)=(0,1,2,3) is processed through an 'Identical' system is?
Option A:	(3,2,1,0)
Option B:	(1,2,3,0)
Option C:	(0,1,2,3)
Option D:	None of the mentioned
Q5.	If a system does not have a bounded output for bounded input, then the system is said to be _____
Option A:	Causal
Option B:	Non-causal
Option C:	Stable
Option D:	Non-stable
Q6.	The output signal when a signal x(n)=(0,1,2,3) is processed through an 'Delay' system is?
Option A:	(3,2,1,0)
Option B:	(1,2,3,0)

Option C:	(0,1,2,3)
Option D:	None of the mentioned
Q7.	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:	Modulating
Q8.	What is output signal when a signal x(t)=cos(2*pi*40*t) is sampled with a sampling frequency of 20Hz?
Option A:	cos(pi*n)
Option B:	cos(2*pi*n)
Option C:	cos(4*pi*n)
Option D:	cos(8*pi*n)
Q9.	What is the Nyquist rate of the signal x(t)=3cos(50*pi*t)+10sin(300*pi*t)-cos(100*pi*t)?
Option A:	50Hz
Option B:	100Hz
Option C:	200Hz
Option D:	300Hz
Q10.	If the sampling rate Fs satisfies the sampling theorem, then the relation between quantization errors of analog signal(eq(t)) and discrete-time signal(eq(n)) is?
Option A:	eq(t)=eq(n)
Option B:	eq(t)<eq(n)
Option C:	eq(t)>eq(n)
Option D:	not related
Q11.	If x(n)=(0,0,1,2,3,4,0,0) then x(n-2) is?
Option A:	(0,0,2,4,6,8,0,0)
Option B:	(0,0,1,2,3,4,0,0)
Option C:	(1,2,3,4,0,0,0,0)
Option D:	(0,0,0,0,1,2,3,4)
Q12.	What is the ROC of the signal x(n)=δ(n-k), k>0?
Option A:	z=0
Option B:	z=∞
Option C:	Entire z-plane, except at z=0
Option D:	Entire z-plane, except at z=∞
Q13.	What is the ROC of z-transform of finite duration anti-causal sequence?
Option A:	z=0
Option B:	z=∞
Option C:	Entire z-plane, except at z=0

Option D:	Entire z-plane, except at z=∞
Q14.	Which of the following justifies the linearity property of z-transform? [x(n)↔X(z)].
Option A:	x(n)+y(n) ↔ X(z)Y(z)
Option B:	x(n)+y(n) ↔ X(z)+Y(z)
Option C:	x(n)y(n) ↔ X(z)+Y(z)
Option D:	x(n)y(n) ↔ X(z)Y(z)
Q15.	If X(z) is the z-transform of the signal x(n), then what is the z-transform of the signal x(-n)?
Option A:	X(-z)
Option B:	X(z-1)
Option C:	X-1(z)
Option D:	None of the mentioned
Q16.	Which of the following is true regarding the number of computations required to compute an N-point DFT?
Option A:	N^2 complex multiplications and N(N-1) complex additions
Option B:	N^2 complex additions and N(N-1) complex multiplications
Option C:	N^2 complex multiplications and N(N+1) complex additions
Option D:	N^2 complex additions and N(N+1) complex multiplication
Q17.	If N=LM, then what is the value of W_N^{mqL}?
Option A:	W_M^{mq}
Option B:	W_L^{mq}
Option C:	W_N^{mq}
Option D:	None of the mentioned
Q18.	What is the model that has been adopt for characterizing round of errors in multiplication?
Option A:	Multiplicative white noise model
Option B:	Subtractive white noise model
Option C:	Additive white noise model
Option D:	None of the mentioned
Q19.	What is the total number of quantization errors in the computation of single point DFT of a sequence of length N?
Option A:	2N
Option B:	4N
Option C:	8N
Option D:	12N
Q20.	How many number of bits are required to compute the DFT of a 1024-point sequence with a SNR of 30db?
Option A:	5
Option B:	10

Option C:	5
Option D:	20
Q21.	Which of the following is used in the realization of a system?
Option A:	Delay elements
Option B:	Multipliers
Option C:	Adders
Option D:	All of the mentioned
Q22.	Which of the following refers the number of memory locations required to store the system parameters, past inputs, past outputs and any intermediate computed values?
Option A:	Computational complexity
Option B:	Finite world length effect
Option C:	Memory requirements
Option D:	None of the mentioned
Q23.	What is the stop band frequency of the normalized low pass Butterworth filter used to design an analog band pass filter with -3.0103dB upper and lower cutoff frequency of 50Hz and 20KHz and a stop band attenuation 20dB at 20Hz and 45KHz?
Option A:	2 rad/sec
Option B:	2.25 Hz
Option C:	2.25 rad/sec
Option D:	2 Hz
Q24.	Which of the following filters cannot be designed using impulse invariance method?
Option A:	Low pass
Option B:	Band pass
Option C:	Low and band pass
Option D:	High pass
Q25.	What is the width of the main lobe of the frequency response of a rectangular window of length M-1?
Option A:	π/M
Option B:	$2\pi/M$
Option C:	$4\pi/M$
Option D:	$8\pi/M$