

# University of Mumbai

## Examination 2020 under cluster 4 (PCE)

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2012

Examination: Third Year Semester VI

Course Code: : ETC602 and Course Name: Discrete Time Signal Processing

Time: 1 hour

Max. Marks: 50

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

Q1.	If all the poles of $H(z)$ are inside the unit circle, then the system is said to be _____
Option A:	Only causal
Option B:	Only BIBO stable
Option C:	BIBO stable and causal
Option D:	Maximum-Phase
Q2.	Consider a system described by impulse response $h(n) = 0.8\delta(n) + 0.36(-0.8)^{n-1}u(n-1)$ is a/an
Option A:	Low pass filter
Option B:	Comb filter
Option C:	high pass filter
Option D:	all pass filter
Q3.	If $X(k)$ is the $N$ -point DFT of a sequence $x(n)$ , then what is the DFT of $x^*(n)$ ?
Option A:	$X(N-k)$
Option B:	$X^*(k)$
Option C:	$X^*(N-k)$
Option D:	$X(n+k)$
Q4.	DIT algorithm divides the sequence into
Option A:	Positive and negative values

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Option B:	Even and odd samples
Option C:	Upper higher and lower spectrum
Option D:	Small and large samples
Q5.	What is the DITFFT of the four point sequence $x(n)=\{1,2,3,4\}$ ?
Option A:	$x(k)=\{10,-2+2j,-2,-2-2j\}$
Option B:	$x(k)=\{6,-2-2j,2,-2+2j\}$
Option C:	$x(k)=\{10,-2-2j,-2,-2+2j\}$
Option D:	$x(k)=\{-10,-2+2j,-2,-2-2j\}$
Q6.	What is the sequence $y(n)$ that results from the use of four point DFTs if the impulse response is $h(n)=\{1,2,3\}$ and the input sequence $x(n)=\{1,2,2,1\}$ ?
Option A:	$\{9,9,7,11\}$
Option B:	$\{1,4,9,11,8,3\}$
Option C:	$\{7,9,7,11\}$
Option D:	$\{9,7,9,11\}$
Q7.	DFT is applied to....
Option A:	Infinite Finite discrete sequences
Option B:	Finite discrete sequences
Option C:	Continuous infinite signals
Option D:	Continuous finite sequences
Q8.	Which of the following filters cannot be designed using impulse invariance method?
Option A:	Low pass
Option B:	Band pass

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Option C:	Low and band pass
Option D:	High pass
Q9.	The poles of Butterworth filter lies on
Option A:	Sphere
Option B:	Ellipse
Option C:	Circle
Option D:	Parabola
Q10.	The mapping in the Bilinear transformation method is
Option A:	One-to-many mapping
Option B:	Many-to-one mapping
Option C:	Many-to-many mapping
Option D:	One-to-one mapping
Q11.	What is the transfer function of normalized butter worth low pass filter of order one.
Option A:	$H(s) = \frac{1}{s - 1}$
Option B:	$H(s) = \frac{1}{s^2 + 1}$
Option C:	$H(s) = \frac{1}{s + 1}$
Option D:	$H(s) = \frac{1}{s^2 - 1}$
Q12.	A low pass Butterworth filter meet the following specification passband frequency is 1000 hz, stop band frequency is 1300hz,pass band attenuation is 3.0103 db and stop band attenuation is 22 db. Find order N of low pass Butterworth Filter
Option A:	N=6
Option B:	N=2
Option C:	N=8

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Option D:	$N=10$
Q13.	What is the Fourier transform of the rectangular window of length $M-1$ ?
Option A:	$w(n)=1, n=0,1,2\dots M-1=0$ , else where
Option B:	$w(n)=1, n=0,1,2\dots M-1=-1$ , else where
Option C:	$w(n)=0, n=0,1,2\dots M-1=1$ , else where
Option D:	$w(n)=0, n=0,1,2\dots M-1=2$ , else where
Q14.	If $M$ is the length of the filter, then at how many number of points, the error function is computed?
Option A:	$2M$
Option B:	$4M$
Option C:	$8M$
Option D:	$16M$
Q15.	Which of the following has linear phase
Option A:	IIR filter
Option B:	Low Pass filter
Option C:	Band Pass Filter
Option D:	FIR filter
Q16.	In direct form realization for an interpolator, which among the following generates an intermediate signal?
Option A:	Upsampler
Option B:	Downsampler
Option C:	Anti-imaging filter
Option D:	Anti-aliasing filter

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Q17.	Decimation is a process in which the sampling rate is
Option A:	Enhanced
Option B:	Stable
Option C:	reduced
Option D:	unpredictable
Q18.	If spectrum is downsample by 2 then $x(n)$ is bandlimited to
Option A:	$\pi/2$ and $-\pi/2$
Option B:	$\pi$ and $-\pi$
Option C:	$\pi/4$ and $-\pi/4$
Option D:	$3\pi/2$ and $-3\pi/2$
Q19.	Which of the following is the advantage of sampling rate conversion by converting the signal into analog signal?
Option A:	Less signal distortion
Option B:	Quantization effects
Option C:	New sampling rate can be arbitrarily selected
Option D:	Bandwidth reduction
Q20.	What is the range of values called as to which the amplitudes of the output during a limit cycle are confined to?
Option A:	Stop band
Option B:	Pass band
Option C:	Live band
Option D:	Dead band
Q21.	With finite precision the response does not converge to the origin but assumes

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	cyclically a set of values
Option A:	The limit cycle
Option B:	Band cycle
Option C:	Dead cycle
Option D:	Binary Memory
Q22.	Quantization is a ___ process
Option A:	Few to few mapping
Option B:	Many to few mapping
Option C:	Few to many mapping
Option D:	Many to many mapping
Q23.	What is the method to prevent overflow ?
Option A:	Saturation arithmetic & Scaling
Option B:	Truncation
Option C:	Rounding
Option D:	Digital System
Q24.	Which inputs are often used in IVR based applications for menu navigation, obtaining numerical input or even for recognizing a digital pattern?
Option A:	DMTF
Option B:	DTMF
Option C:	DFMT
Option D:	DTSF
Q25.	In Delta modulation(DM), What is the order of predictor is used?

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Option A:	Zero-order predictor
Option B:	Second-order predictor
Option C:	First-order predictor
Option D:	Third-order predictor

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	C
Q2.	D
Q3.	C
Q4	B
Q5	A
Q6	D
Q7	B
Q8.	D
Q9.	C
Q10.	D
Q11.	C
Q12.	D
Q13.	A
Q14.	D
Q15.	D
Q16.	A
Q17.	C
Q18.	A
Q19.	C
Q20.	D
Q21.	A
Q22.	B
Q23.	A
Q24.	B
Q25.	C