

Program: BE BIOMEDICAL Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester V

Course Code: BMC504 and Course Name: BIOMEDICAL DIGITAL SIGNAL PROCESSING

Time: 1 hour

Max. Marks: 50

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

Q1.	If a system do 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
Q2.	If the output of the system of the system at any 'n' depends only the futures values of the inputs then the system is said to be _____
Option A:	Non – linear
Option B:	Causal
Option C:	Non - Causal
Option D:	Linear
Q3.	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:	BIBO stable and anti –causal
Q4.	If one or more poles are located near the unit circle, then the rate of decay of signal is _____
Option A:	Slow
Option B:	Constant
Option C:	Rapid
Option D:	Fast
Q5.	The even part of a signal $x(t)$ is?
Option A:	$x(t)+x(-t)(t)+x(-t)$
Option B:	$x(t)-x(-t)$
Option C:	$(1/2)*(x(t)+x(-t))$
Option D:	$(1/2)*(x(t)-x(-t))$

Q6.	What is the circular convolution of the sequences $X_1(n)=\{2,1,2,1\}$ and $x_2(n)=\{1,2,3,4\}$?
Option A:	$\{14,14,16,16\}$
Option B:	$\{16,16,14,14\}$
Option C:	$\{2,3,6,4\}$
Option D:	$\{14,16,14,16\}$
Q7.	$x(n)=\{1,1,1,1\}$. The DFT of this signal is
Option A:	$\{4,0,0,0\}$
Option B:	$\{4,0,0,1\}$
Option C:	$\{4,4,4,4\}$
Option D:	$\{1,1,0,0\}$
Q8.	Perform linear convolution of $x(n) = \{1,1,0,1, 1\}$ $h(n) = \{1, -2, -3,4\}$
Option A:	$\{1, -1, 1, -5, 2, 3, -5, 1, 4\}$
Option B:	$\{1, -1, -5, 2, 3, -5, 1, 4\}$
Option C:	$\{1, 1, 5, 2, 3, , 1, 4\}$
Option D:	$\{1, -1, -5, 2, 3, -5, 1, 4\}$
Q9.	The Fourier transform of a discrete-time periodic signal is
Option A:	Continuous and non-periodic
Option B:	Discrete and non-periodic
Option C:	Continuous and Periodic
Option D:	discrete and Periodic
Q10.	Compute the IDFT of $X(k)=\{26, -2+2j, -2, -2-2j\}$
Option A:	$X(k)=\{5, 4,3,8\}$
Option B:	$X(k)=\{5,6,7,8\}$
Option C:	$X(k)=\{5,7,6,8\}$
Option D:	$X(k)=\{5,8,7,6\}$
Q11.	Bit reversal format is used in
Option A:	DFT
Option B:	z-transform
Option C:	DTFT
Option D:	FFT
Q12.	The first four output of 8 point radix 2 FFT are $X(0)=27, X(1)=4+3j, X(2)=4+j, X(3)=-5j$. which of following statement is true?
Option A:	$X(7)=5j$
Option B:	Dc value is 27
Option C:	$X(7)=4-j$
Option D:	$X(7)=5j$
Q13.	If $s=\sigma +j \Omega$ and $z=re^{j\omega}$ and $r=1$, then which of the following inference is correct?
Option A:	LHS of the s-plane is mapped inside the circle, $ z =1$

Option B:	RHS of the s-plane is mapped outside the circle, $ z =1$
Option C:	Imaginary axis in the s-plane is mapped to the circle, $ z =1$
Option D:	RHS of the s-plane is mapped inside the circle, $ z =1$
Q14.	Which of the following rule is used in the bilinear transformation?
Option A:	Simpson's rule
Option B:	Backward difference
Option C:	Forward difference
Option D:	Trapezoidal rule
Q15.	The anti-symmetric condition with M even is not used in the design of which of the following linear-phase FIR filter?
Option A:	Low pass
Option B:	High pass
Option C:	Band pass
Option D:	Band stop
Q16.	FIR filter is always stable because all of its pole(s) are
Option A:	Origin
Option B:	at the infinity
Option C:	at the ROC
Option D:	on the real axis
Q17.	Out of all the windows available, the one which has the narrowest main lobe for a given length is
Option A:	Rectangular
Option B:	Blackman
Option C:	Hanning
Option D:	Hamming
Q18.	Co-efficient symmetry is important in FIR filters because it provides
Option A:	A smaller transition bandwidth
Option B:	less stop band ripple
Option C:	less pass-band ripple
Option D:	linear phase response
Q19.	The width of the main-lobe should be _____ and it should contain as much of the total energy as possible
Option A:	Very Large
Option B:	Large
Option C:	Medium
Option D:	Small
Q20.	In the impulse invariant design procedure, the relationship between continuous-time and discrete-time frequency is
Option A:	Non-linear

Option B:	Parabolic
Option C:	Linear
Option D:	Exponential
Q21.	What is the minimum number of multipliers, adders and delay elements required to implement a linear phase filter with $h(n)=0$ for $n<0$ and $n>15$
Option A:	15 multipliers, 15 adders, and 15 delay elements
Option B:	8 multipliers, 8 adders and 15 delay elements
Option C:	8 multipliers, 8 adders and 15 delay elements
Option D:	15 multipliers, 8 adders and 15 delay elements
Q22.	The mapping in the impulse invariant method is
Option A:	Many to many
Option B:	One to Many
Option C:	Many to one
Option D:	One to one
Q23.	What is the frequency response of system with input $h(n)$ and window of length M ?
Option A:	$\sum_{n=0}^{M-1} h(n) e^{j\omega n}$
Option B:	$\sum_{n=0}^M h(n) e^{j\omega n}$
Option C:	$\sum_{n=0}^M h(n) e^{j\omega n}$
Option D:	$\sum_{n=0}^{M-1} h(n) e^{-j\omega n}$
Q24.	What is lowest order of butter-worth filter with pass band gain $k_p = -1$ decibel at $\Omega_p = 4$ rad/sec and stop band attenuation greater than or equal to 20 decibel at $\Omega_s = 8$ rad/sec?
Option A:	4
Option B:	5
Option C:	6
Option D:	3
Q25.	The pipelining refers to
Option A:	Prefetching instructions and storing in a FIFO queue
Option B:	Fetching instruction and data simultaneously
Option C:	Executing different phases of two or more instruction in parallel
Option D:	Executing different instruction in parallel using two or more computational units

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	D
Q2.	C
Q3.	C
Q4	A
Q5	C
Q6	D
Q7	A
Q8.	D
Q9.	D
Q10.	B
Q11.	D
Q12.	B
Q13.	C
Q14.	D
Q15.	A

Q16.	A
Q17.	A
Q18.	A
Q19.	B
Q20.	C
Q21.	C
Q22.	C
Q23.	D
Q24.	B
Q25.	C