

NADAR SARSWATHI COLLEGE OF ENGINEERING AND TECHNOLOGY, THENI.

Course/Branch: B.E/EEE	Year / Semester : III/V	Format No.	NAC/TLP-07a.13
Subject Code : EE8591	Subject Name : Digital Signal Processing	Rev. No.	02
Unit No : 2	Unit Name : Discrete Time System Analysis	Date	30/09/20

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	
1.	The Z-Transform $X(z)$ of a discrete time signal $x(n)$ is defined as a) $\sum_{n=-\infty}^{\infty} x(n)z^n$ b) $\sum_{n=-\infty}^{\infty} x(n)z^{-n}$ c) $\sum_{n=0}^{\infty} x(n)z^n$ d) None of the mentioned	L1
2.	What is the set of all values of z for which $X(z)$ attains a finite value? a) Radius of convergence b) Radius of divergence c) Feasible solution d) None of the mentioned	L2
3.	What is the z-transform of the following finite duration signal? $x(n) = \{2, 4, 5, 7, 0, 1\}$ ↑ a) $2 + 4z + 5z^2 + 7z^3 + z^4$ b) $2 + 4z + 5z^2 + 7z^3 + z^5$ c) $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$ d) $2z^2 + 4z + 5 + 7z^{-1} + z^{-3}$	L3
4.	What is the ROC of the signal $x(n) = \delta(n-k)$, $k > 0$? a) $z=0$ b) $z=\infty$ c) Entire z-plane, except at $z=0$ d) Entire z-plane, except at $z=\infty$	L3
5.	What is the ROC of a causal infinite length sequence? a) $ z < r_1$ b) $ z > r_1$	L2

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	c) $r_2 < z < r_1$ d) None of the mentioned	
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6.	Which of the following justifies the linearity property of z-transform? $[x(n) \leftrightarrow X(z)]$. a) $x(n)+y(n) \leftrightarrow X(z)Y(z)$ b) $x(n)+y(n) \leftrightarrow X(z)+Y(z)$ c) $x(n)y(n) \leftrightarrow X(z)+Y(z)$ d) $x(n)y(n) \leftrightarrow X(z)Y(z)$	L1
7.	What is the z-transform of the signal $x(n)=[3(2^n)-4(3^n)]u(n)$? a) $31-2z-1-41-3z-1$ b) $31-2z-1-41+3z-1$ c) $31-2z-41-3z$ d) None of the mentioned	L3
8.	According to Time shifting property of z-transform, if $X(z)$ is the z-transform of $x(n)$ then what is the z-transform of $x(n-k)$? a) $z^k X(z)$ b) $z^{-k} X(z)$ c) $X(z-k)$ d) $X(z+k)$	L1
9.	If $X(z)$ is the z-transform of the signal $x(n)$ then what is the z-transform of $a^n x(n)$? a) $X(az)$ b) $X(az^{-1})$ c) $X(a^{-1}z)$ d) None of the mentioned	L2
10.	If $X(z)$ is the z-transform of the signal $x(n)$, then what is the z-transform of	L2

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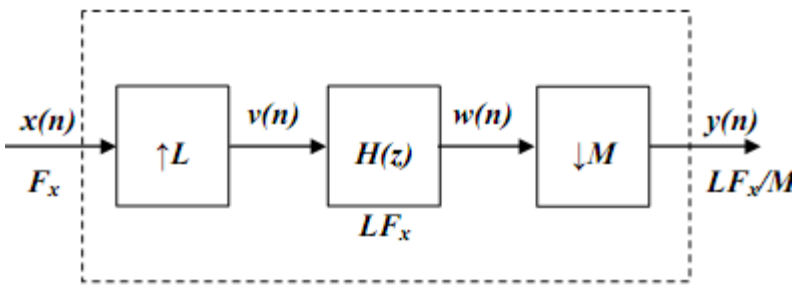
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	<p>the signal $x(-n)$?</p> <p>a) $X(-z)$ b) $X(z^{-1})$ c) $X^{-1}(z)$ d) None of the mentioned</p>	
11.	<p>$X(z)$ is the z-transform of the signal $x(n)$, then what is the z-transform of the signal $nx(n)$?</p> <p>a) $-z dX(z)/dz$ b) $z dX(z)/dz$ c) $-z^{-1} dX(z)/dz$ d) $z^{-1} dX(z)/dz$</p>	L3
12.	<p>What is the z-transform of the signal $x(n)=na^n u(n)$?</p> <p>a) $(az)^{-1}(1-(az)^{-1})^2$ b) $az^{-1}(1-(az)^{-1})^2$ c) $az^{-1}(1-az^{-1})^2$ d) $az^{-1}(1+az^{-1})^2$</p>	L2
13.	<p>Sampling rate conversion by the rational factor I/D is accomplished by what connection of interpolator and decimator?</p> <p>a) Parallel b) Cascade c) Convolution d) None of the mentioned</p>	L1
14.	<p>Which of the following operation is performed by the blocks given the figure below?</p>	L2

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	 <p>a) Sampling rate conversion by a factor I b) Sampling rate conversion by a factor D c) Sampling rate conversion by a factor D/I d) Sampling rate conversion by a factor I/D</p>	
15.	What are the values of z for which the value of X(z)=0? a) Poles b) Zeros c) Solutions d) None of the mentioned	L1
16.	Which of the following method is used to find the inverse z-transform of a signal? a) Counter integration b) Expansion into a series of terms c) Partial fraction expansion d) All of the mentioned	L2
17.	What is the inverse z-transform of X(z)=1-1.5z ⁻¹ +0.5z ⁻² if ROC is z >1? a) (2-0.5ⁿ)u(n) b) (2+0.5 ⁿ)u(n) c) (2 ⁿ -0.5 ⁿ)u(n) d) None of the mentioned	L3
18.	The z-transform of a signal x(n) whose definition is given by X(z)=∑ _{n=0} [∞] x(n)z ⁻ⁿ is known as _____	L3

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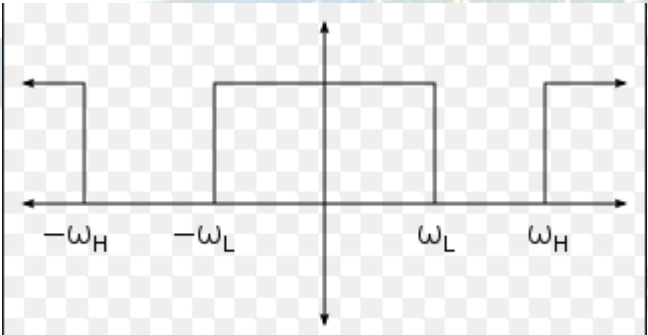
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	<p>a) Unilateral z-transform b) Bilateral z-transform c) Rational z-transform d) None of the mentioned</p>	
19.	<p>What is the one sided z-transform of $x(n)=\delta(n-k)$?</p> <p>a) z^{-k} b) z^k c) 0 d) 1</p>	L2
20.	<p>If all the poles of $H(z)$ are outside the unit circle, then the system is said to be _____</p> <p>a) Only causal b) Only BIBO stable c) BIBO stable and causal d) None of the mentioned</p>	L1
21.	<p>If all the poles have small magnitudes, then the rate of decay of signal is _____</p> <p>a) Slow b) Constant c) Rapid d) None of the mentioned</p>	L1
22.	<p>Which of the following is the equation for the Fourier series coefficient?</p> <p>a) $\frac{1}{T_p} \int_{t_0+T_p} x(t) e^{-j2\pi k F_0 t} dt$ b) $\frac{1}{T_p} \int_{-\infty}^{\infty} x(t) e^{-j2\pi k F_0 t} dt$ c) $\frac{1}{T_p} \int_{t_0+T_p} x(t) e^{-j2\pi k F_0 t} dt$ d) $\frac{1}{T_p} \int_{t_0+T_p} x(t) e^{j2\pi k F_0 t} dt$</p>	L2
23.	<p>What is the spectrum that is obtained when we plot $c_k ^2$ as a function of frequencies kF_0, $k=0, \pm 1, \pm 2..?$</p> <p>a) Average power spectrum</p>	L2

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	<p>b) Energy spectrum c) Power density spectrum d) None of the mentioned</p>	
24.	<p>If $X(\omega)$ is the Fourier transform of the signal $x(n)$, then what is the Fourier transform of the signal $x(n-k)$?</p> <p>a) $e^{j\omega k} \cdot X(-\omega)$ b) $e^{j\omega k} \cdot X(\omega)$ c) $e^{-j\omega k} \cdot X(-\omega)$ d) $e^{-j\omega k} \cdot X(\omega)$</p>	L2
25.	<p>What is the convolution of the sequences of $x_1(n)=x_2(n)=\{1,1,1\}$?</p> <p>a) $\{1,2,3,2,1\}$ b) $\{1,2,3,2,1\}$ c) $\{1,1,1,1,1\}$ d) $\{1,1,1,1,1\}$</p>	L3
26.	<p>Which filter has a magnitude frequency response as shown in the plot given below?</p>  <p>a) Low pass Filter b) High pass Filter c) Band pass Filter d) Band stop Filter</p>	L4
27.	<p>If $h_{lp}(n)$ denotes the impulse response of a low pass filter with frequency response $H_{lp}(\omega)$, then what is the frequency response of the high pass filter in</p>	L3

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	<p>terms of $H_{lp}(\omega)$?</p> <p>a) $H_{lp}(\omega-\pi/2)$ b) $H_{lp}(\omega+\pi/2)$ c) $H_{lp}(\omega-\pi)$ d) $H_{lp}(\omega+\pi)$</p>	
28.	<p>If a system is said to be invertible, then?</p> <p>a) One-to-one correspondence between its input and output signals b) One-to-many correspondence between its input and output signals c) Many-to-one correspondence between its input and output signals d) None of the mentioned</p>	L2
29.	<p>What is the causal inverse of the FIR system with impulse response $h(n)=\delta(n)-a\delta(n-1)$?</p> <p>a) $\delta(n)-a\delta(n-1)$ b) $\delta(n)+a\delta(n-1)$ c) a^{-n} d) a^n</p>	L3
30.	<p>If the frequency response of an FIR system is given as $H(z)=1-z^{-1}-6z^{-2}$, then the system is _____</p> <p>a) Minimum phase b) Maximum phase c) Mixed phase d) None of the mentioned</p>	L3