

ESE September 2020 Set 1

1	<p>$Y(t) = x(2t)$ is _____</p> <p>a) Compressed signal b) Expanded signal c) Shifted signal d) Amplitude scaled signal by a factor of</p>	1
2	<p>Z-transform of '$u[n]$' is given by,</p> <p>(a) $\frac{z}{z-a}$ (b) $\frac{z}{z-1}$ (c) $\frac{z}{(z-1)^2}$ (d) $\frac{az}{(z-a)^2}$</p>	2
3	<p>What is the set of all values of Z for which $X(Z)$ attains a finite value?</p> <p>a) Region of convergence b) Radius of divergence c) Feasible solution d) Radius of solution</p>	1
4	<p>What is the z-transform of the finite duration signal $x(n) = \{2, 4, 5, 7, 0, 1\}$</p> <p>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) $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$</p>	2
5	<p>What is the ROC of the z-transform of the signal $x(n) = a^n u(n) + b^n u(-n-1)$?</p> <p>a) $a < z < b$ b) $a > z > b$ c) $a > z < b$ d) $a < z > b$</p>	2
6	<p>What is the ROC of z-transform of finite duration anti-causal sequence?</p> <p>a) $z=0$ b) $z=\infty$ c) Entire z-plane, except at $z=0$ d) Entire z-plane, except at $z=\infty$</p>	1

7	<p>What is the ROC of z-transform of an two sided infinite sequence?</p> <p>a) $z >r1$ b) $z <r1$ c) $r2< z <r1$ d) $z =r1$</p>	2
8	<p>What is the ROC of the system function H(z) if the discrete time LTI system is BIBO stable?</p> <p>a) Entire z-plane, except at $z=0$ b) Entire z-plane, except at $z=\infty$ c) Contain unit circle d) None of the mentioned</p>	2
9	<p>The response of any discrete time system can be decomposed as _____</p> <p>a) Total Response=Impulse+step b) Total Response=Impulse+Ramp c) Total Response=zero-output response d) Total Response=zero-state response+zero-input response</p>	1
10	<p>Zero-input response is also known as _____</p> <p>a) zero-state response b) Natural response c) state-input response d) Forced response</p>	1
11	<p>Convolution $x(t)*\delta(t-t1)$ is equal to</p> <p>a) $\delta(t)$ b) $x(t-t1)$ c) $tu(t-t1)$ d) $\delta(t-t1)$</p>	1
12	<p>What is the area of a Unit Impulse function?</p> <p>a) Zero b) Half of Unity c) Depends on the function d) Unity</p>	1
13	<p>If $h1$, $h2$ and $h3$ are cascaded, and $h1 = u(t)$, $h2 = \exp(t)$ and $h3 = \sin(t)$, find the overall impulse response</p> <p>a) $\sin(t)*\exp(t)*u(t)$ b) $\sin(t) + \exp(t) + u(t)$ c) $u(t)*\sin(t)$ d) $\sin(t)$</p>	1
14	<p>Find the convolution sum of sequences $x1[n] = (1, 2, 3)$ and $x2[n] = (2, 1, 4)$.</p> <p>a) $\{2, 5, 12, 11, 12\}$ b) $\{2, 12, 5, 11, 12\}$ c) $\{2, 11, 5, 12, 12\}$ d) $\{-2, 5,-12, 11, 12\}$</p>	1
15	<p>Non periodic signals $x(n)=[1,2,3,4]$ and $h(n)=[5,6,7,8]$ then Convolution of this is</p> <p>a) $y(n) = [5 \ 16 \ 34 \ 60 \ 61 \ 52 \ 32]$ b) $y(n) = [66 \ 68 \ 66 \ 60]$ c) $y(n) = [8 \ 23 \ 44 \ 70 \ 56 \ 39 \ 20]$ d) $y(n)=[60 \ 66 \ 68 \ 66]$</p>	2

16	<p>Periodic signals $x(n)=[1,2,3,4]$ and $h(n)=[5,6,7,8]$ then Circular Convolution of this is</p> <p>a) $y(n) = [5 \ 16 \ 34 \ 60 \ 61 \ 52 \ 32]$ b) $y(n) = [66 \ 68 \ 66 \ 60]$ c) $y(n) = [8 \ 23 \ 44 \ 70 \ 56 \ 39 \ 20]$ d) $y(n) = [60 \ 66 \ 68 \ 66]$</p>	2
17	<p>Following is a Signal Processing Application</p> <p>a) RC Circuit Design b) Transistor Design c) Power Supply Design d) Speech and Audio Processing</p>	1
18	<p>A LTI system is said to be initially relaxed system only if ____</p> <p>a. Zero input produces zero output b. Zero input produces non-zero output c. Zero input produces an output equal to unity d. Zero input produces an output equal to 2</p>	1
19	<p>Which of the following system is Causal System?</p> <p>$y(n) = x(n)$ $y(n) = x(n + 2)$ $y(n) = x(2n)$ $y(n) = x(n + 4)$</p>	1
20	<p>Which of the following system is Time Variant System?</p> <p>$y(n) = n.x(n)$ $y(n) = x(n)$ $y(n) = x(n - 2)$ $y(n) = x(n + 4)$</p>	2
21	<p>Which of the following system is Static System?</p> <p>$y(n) = \cos [x(n)]$ $y(n) = \cos [x(n + 1)]$ $y(n) = \cos [x(n - 1)]$ $y(n) = \cos [x(n^2)]$</p>	1
22	<p>Which of the following signal is periodic?</p> <p>$x(n) = \sin (2\pi n)$ $x(n) = \sin (2n + \pi)$ $x(n) = \sin (2n)$ $x(n) = \sin (2n + \pi/2)$</p>	2
23	<p>Which of the following signal is even?</p> <p>$x(n) = \{3, 2, 1, \underset{\uparrow}{0}, 1, 2, 3\}$</p>	1

	$x(n) = \{3, 2, 1, \frac{0}{T}, -1, -2, -3\}$ $x(n) = \{-3, -2, -1, \frac{0}{T}, 1, 2, 3\}$ $x(n) = \{3, -2, 1, \frac{0}{T}, -1, 2, -3\}$	
24	<p>Which of the following signal is Energy signal?</p> $y(n) = \cos(2\pi n); 0 < n < 10$ $y(n) = \cos(2\pi n); 0 < n < \infty$ $y(n) = \cos(2\pi n); -\infty < n < 0$ $y(n) = \cos(2\pi n); -\infty < n < \infty$	1
25	<p>Which of the following signal is Causal Signal?</p> $x(n) = U(n)$ $x(n) = U(-n)$ $x(n) = U(-n + 2)$ $x(n) = U(-n - 2)$	1
26	<p>Which of the following signal is AntiCausal Signal?</p> $x(n) = U(-n-1)$ $x(n) = U(n-2) - U(n-4)$ $x(n) = U(n) - U(n-2)$ $x(n) = U(n-2)$	1
27	<p>If $x(n) \leftrightarrow X(w)$ then Fourier Transform of the following signal $x(n-k)$ is?</p> <p>a $X(w)$ $e^{-i\omega k} X(w)$ $X(-w)$ $X(w - k)$</p>	1
28	<p>The Laplace transform of the delta signal $\delta(t)$ is given as</p> <p>1 $1/S$ $1/S^2$ $1/(S + a)$</p>	1
29	<p>The Laplace transform of the signal $e^{at}U(t)$ is given as</p> <p>$1/(S - a)$ $1/S$ $1/S^2$ $1/(S + a)$</p>	2

30	<p>The Laplace transform of the signal $\sin wt.U(t)$ is given as</p> <p>$w / (s^2 + w^2)$</p> <p>$s / (s^2 + w^2)$</p> <p>$1 / (s^2 + w^2)$</p> <p>$-1 / (s^2 + w^2)$</p>	2
31	<p>The Laplace transform of the signal $\cos wt.U(t)$ is given as</p> <p>$w / (s^2 + w^2)$</p> <p>$s / (s^2 + w^2)$</p> <p>$1 / (s^2 + w^2)$</p> <p>$-1 / (s^2 + w^2)$</p>	2
32	<p>The Laplace transform of the signal $x(t) = t$ is given as</p> <p>$1/s^2$</p> <p>$2/s^3$</p> <p>$6/s^4$</p> <p>$24/s^5$</p>	2
33	<p>If signal is even then which component of Trigonometric Fourier series becomes zero</p> <p>a_n</p> <p>b_n</p> <p>a_n and b_n</p> <p>None</p>	1
34	<p>If time domain signal is continuous and periodic then frequency domain signal is</p> <p>continuous and periodic</p> <p>continuous and aperiodic</p> <p>discrete and periodic</p> <p>discrete and aperiodic</p>	1
35	<p>In the state model of the discrete time system represented by $Q(n + 1) = AQ(n) + BX(n)$, the input matrix is represented by</p> <p>A</p> <p>B</p> <p>$Q(n)$</p> <p>$X(n)$</p>	1
36	<p>In the state model of the discrete time system represented by $Y(n) = CQ(n) + DX(n)$, the output matrix is represented by</p>	1

	C D Q(n) X(n)	
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