Program: BE –Electronics and Tele communication Engineering

Curriculum Scheme: Revised 2016

Examination: Second Year Semester IV

Course Code: ECC404 and Course Name: Signals and Systems

Time: 1 hour Max. Marks: 50

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

Q1.	The signal cos($\frac{\pi}{8}n^2$)is
Option A:	Periodic with fundamental period of N=8
Option B:	Periodic with fundamental period of N=4
Option C:	Periodic with fundamental period of N=16
Option D:	Aperiodic
Q2.	An LTI system has to satisfy
Option A:	Only additivity and homogeneity properties.
Option B:	Only additivity and time invariance properties.
Option C:	Only time invariance and homogeneity properties.
Option D:	Time invariance, additivity and homogeneity properties.
Q3.	The odd component of the complex exponential signal $e^{j\omega 0t}$is
Option A:	Sin(ω_0t)
Option B:	cos(ω_0t)
Option C:	jSin(ω_0t)
Option D:	-jcos (ω_0t)
Q4.	Consider the system with output y(t)=x(t) sin (ωct) where x(t) is the input signal . Which of the following properties are satisfied by the system. 1)Linear2) Memoryless 3)Time invariant4)BIBO stable
Option A:	Only 1,2,4
Option B:	Only 1,2,3
Option C:	Only 1,3,4
Option D:	Only 2,3,4
Q5.	LTI system with impulse response h(t) is BIBO stable if
Option A:	$\|h(t)\| \leq 1$
Option B:	$\int_{-\infty}^{\infty} \|h(t)\|^2 < \infty$

Option C:	$\int_{-\infty}^{\infty} \lvert h(t)\rvert < \infty$
Option D:	$\lvert h(t)\rvert = 0$ for t< 0
Q6.	LTI system with impulse response h(t) is causal if
Option A:	$\lvert h(t)\rvert \leq 1$
Option B:	$\int_{-\infty}^{\infty} \lvert h(t)\rvert^2 < \infty$
Option C:	$\int_{-\infty}^{\infty} \lvert h(t)\rvert < \infty$
Option D:	$\lvert h(t)\rvert = 0$ for t< 0
Q7.	The Laplace transform of x(t)=$e^{-4\lvert t\rvert}$ is
Option A:	- $\frac{8}{S^2-16}$
Option B:	- $\frac{8}{S^2+16}$
Option C:	$\frac{8}{S^2-16}$
Option D:	$\frac{8}{S^2+16}$
Q8.	The inverse Laplace Transform of X(S) =$\frac{4}{(S+2)(S+4)}$ if the ROC is Re{S}>-2 is
Option A:	x(t)=2{e^{-t}- e^{-4t}} u(t)
Option B:	x(t)=2{e^{-t}- e^{-4t}} u(-t)
Option C:	x(t)=2{$e^{-t}u(-t) + e^{-4t}\mathrm{u(t)}$}
Option D:	x(t)=2{$e^{-t}u(t) + e^{-4t}\mathrm{u}(-\mathrm{t})$}
Q9.	The Fourier transform of Signum function is
Option A:	$\frac{j2}{\Omega}$
Option B:	$\frac{1}{\mathrm{j}\Omega}$
Option C:	- $\frac{2}{\mathrm{j}\Omega}$
Option D:	$\frac{2}{\mathrm{j}\Omega}$
Q10.	Even part of the signal x(n)={4,-4,2,-2) is
Option A:	{-1,1,-2,$\underset{\uparrow}{4}$,-2,1,-1}
Option B:	{-1,1,-2,4,-2,$\underset{\uparrow}{1}$,-1}
Option C:	{1,-1,-2,$\underset{\uparrow}{0}$,-2,1,-1}
Option D:	{-1,1,$\underset{\uparrow}{-2}$,4,-2,1,-1}

Q11.	x(n)=u(n)
Option A:	Is a power signal with P=0.5W and E=∞
Option B:	Is an Energy signal with E=0.5J and P=0
Option C:	Is neither an Energy nor a power signal
Option D:	Is Power signal with P=0.5W and E=0
Q12.	For a finite duration non causal discrete time signal
Option A:	ROC is entire Z plane except z=0
Option B:	ROC is entire Z plane except z=∞
Option C:	ROC is entire Z plane except z=0 and z=∞
Option D:	ROC is exterior of unit circle in Z plane.
Q13.	Fourier coefficients of exponential form of Fourier series is represented as
Option A:	$C_K = \frac{1}{T_0}\int_0^{T_0} x(t)\, e^{-jK\Omega_0 t} dt$
Option B:	$C_K = \int_0^{T_0} x(t)\, e^{-jK\Omega_0 t} dt$
Option C:	$C_K = \frac{1}{T_0}\int_0^{T_0} x(t)\, e^{jK\Omega_0 t} dt$
Option D:	$C_K = \int_0^{T_0} x(t)\, e^{jK\Omega_0 t} dt$
Q14.	Fourier series representation of the signal x(t)=$sin^2 t$ is
Option A:	x(t)= -$\frac{1}{4} e^{-j2t} + \frac{1}{2} + \frac{1}{4} e^{j2t}$
Option B:	x(t)= -$\frac{1}{4} e^{-j2t} - \frac{1}{2}$ - $\frac{1}{4} e^{j2t}$
Option C:	x(t)= -$\frac{1}{4} e^{-j2t} + \frac{1}{2}$ - $\frac{1}{4} e^{j2t}$
Option D:	x(t)= $\frac{1}{4} e^{-j2t} + \frac{1}{2}$ - $\frac{1}{4} e^{j2t}$
Q15.	IF X(Ω)=δ(Ω) then x(t)=
Option A:	x(t)=1
Option B:	x(t)=$\frac{1}{2\pi}$
Option C:	x(t)=$\frac{\pi}{2}$
Option D:	x(t)=0.5
Q16.	Which of the transform below is best suited to represent discrete time aperiodic signal x(n) of infinite duration.
Option A:	Fourier Transform.
Option B:	Discrete time Fourier Transform.
Option C:	Complex exponential Fourier series.
Option D:	Discrete Fourier Transform.
Q17.	The convolution of the two sequence x(n)={1,2,-1,0,3} and h(n)={1,2,-1} is

Option A:	y(n)={1,4,2,-4,4,6,-3}
Option B:	y(n)={1,$\underset{\uparrow}{4}$,2,-4,4,6,-3}
Option C:	y(n)={1,4,2,-$\underset{\uparrow}{4}$,0,6,-3}
Option D:	y(n)={0,1,4,2,-4,4,6,-3}
Q18.	Z transform of $x(n)=0.5^n u(n)$ is
Option A:	z/(z+0.5)
Option B:	z/(z-0.5)
Option C:	1/(z+0.5)
Option D:	1/(z-0.5)
Q19.	$Z\{a_1x_1(n)+a_2x_2(n)\} = a_1X_1(z)+a_2X_2(z)$ is
Option A:	Correlation property of Z –Transform.
Option B:	Convolution property of Z –Transform.
Option C:	Linearity property of Z –Transform.
Option D:	Shifting property of Z –Transform.
Q20.	If $X(Z) = z^2/(z^2-1)$ Then initial value x(0) of the given z-domain signal is
Option A:	1
Option B:	0.5
Option C:	0
Option D:	0.25
Q21.	In direct form- II structure ,the number of delays depends on
Option A:	ROC of the system.
Option B:	Stability of the system.
Option C:	Linearity property of the system
Option D:	Order of the system.
Q22.	Direct form-I structure(with M zeros) realization of an N^{th} order IIR discrete time systems involves number of delays equal to
Option A:	M-N
Option B:	M+N
Option C:	M
Option D:	N
Q23.	x(t) = A×U(t) The Laplace Transform and ROC is
Option A:	X(s)=A/s ; ROC is right half of s-plane
Option B:	X(s)=A/s ; ROC is Left half of s-plane
Option C:	X(s)=A/s ; ROC is entire s-plane
Option D:	$X(s)=A/s^2$; ROC is right half of s-plane
Q24.	If Laplace transform of x(t) is X(s) then Laplace transform of x(t+a)
Option A:	$e^{as}X(s)$

Option B:	$e^{-as}X(s)$
Option C:	X(s-a)
Option D:	X(s+a)
Q25.	Fourier series is useful for frequency domain analysis of
Option A:	Aperiodic signals.
Option B:	Periodic signals.
Option C:	FIR systems.
Option D:	IIR systems.