

Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2012

Examination: Second Year Semester IV

Course Code: ETS405

Course Name: Signals & Systems

Time: 1 hour

Max. Marks: 50

Note: All the questions are compulsory and carry equal marks.

Q1.	Which is odd component of signal : $x(t) = e^{jt}$?
Option A:	cos t
Option B:	j cos t
Option C:	j sin t
Option D:	sin t
Q2.	Which of the following signal is neither energy nor power signal?
Option A:	Unit step signal
Option B:	Impulse signal
Option C:	Ramp Signal
Option D:	Exponential signal
Q3.	An example of a discrete set of information system is
Option A:	the trajectory of the Sun
Option B:	data on a CD
Option C:	universe time scale
Option D:	movement of water through a pipe
Q4.	if $x[n] = \{2, 1, 2, 1\}$ then $x[n-3]$ is
Option A:	$\{0, 0, 0, 2, 1, 2, 1\}$

Option B:	{0, 0, 2, 1, 2, 1}
Option C:	{0, 2, 1, 2, 1}
Option D:	{0, 0, 0, 0, 2, 1, 2, 1}
Q5.	Convolution of the two discrete time sequences $x_1(n) = \{1, 2, 3, 4\}$ and $x_2 = \{1, -1, 0, 1\}$
Option A:	{1, 1, 1, 1}
Option B:	{1, 1, 1, 2, -2, 3, 4}
Option C:	{4, 3, 1, 1, 1, 2, -2}
Option D:	{1, 1, 1, -2, 2, 3, 4}
Q6.	If $h_1(t)$ and $h_2(t)$ are impulse responses of two stable CT LTI systems connected in cascade, the their overall impulse response is
Option A:	$h_1(t) * h_2(t)$
Option B:	$h_1(t) + h_2(t)$
Option C:	$h_1(t) - h_2(t)$
Option D:	$h_1(t) \cdot h_2(t)$
Q7.	What is this property of impulse response $h_1(t) * h_2(t) = h_2(t) * h_1(t)$ is called
Option A:	Associative property
Option B:	Commutative property
Option C:	Distributive property
Option D:	Closure law
Q8.	Convolution integral process is used to determine
Option A:	Time response of the CT system
Option B:	Frequency response of the CT system
Option C:	Phase response of the DT & CT system
Option D:	Characteristics of the CT system

Q9.	The system having input $x(n)$ and output $y(n)$ is defined as $y(n) = \log_{10} x(n) $. This system is
Option A:	Non linear, Causal, Stable
Option B:	Linear, Non Causal, Stable
Option C:	Non linear, Causal, Unstable
Option D:	Linear, Anti Causal, Unstable
Q10.	Find the ROC of $x(t) = e^{-2t} u(t) + e^{-3t} u(t)$.
Option A:	$\sigma > 2$
Option B:	$\sigma > 3$
Option C:	$\sigma > -3$
Option D:	$\sigma > -2$
Q11.	Determine the natural response of the system: Difference equation is $y(n) - y(n-1) - 2y(n-2) = x(n)$ and $y(-1) = 1$; $y(-2) = 0$
Option A:	$y_h(n) = \frac{4}{3}(1)^n - \frac{1}{3}(-1)^n$
Option B:	$y_h(n) = \frac{4}{3}(-1)^n - \frac{1}{3}(-1)^n$
Option C:	$y_h(n) = \frac{4}{3}(2)^n - \frac{1}{3}(-1)^n$
Option D:	$y_h(n) = \frac{4}{3}(2)^n - \frac{1}{3}(2)^n$
Q12.	Determine the Nyquist rate of the signal $x(t) = 1 + \cos(2000)t + \sin(4000)t$
Option A:	2000 Hz
Option B:	4000 Hz
Option C:	1 Hz
Option D:	6000 Hz

Q13.	Initial value of $X(s) = (2S+6)/(s(4s+2))$
Option A:	0
Option B:	0.5
Option C:	1
Option D:	2
Q14.	The Inverse Laplace Transform of $\frac{1}{s+2} - \frac{1}{s-1}$ for $\sigma > 1$
Option A:	$e^{-2t} u(t) - e^t u(t)$
Option B:	$e^{-t} u(t) - e^{-2t} u(t)$
Option C:	$e^{-2t} u(t) + e^t u(t)$
Option D:	$e^{2t} u(t) - e^t u(t)$
Q15.	What is the ROC of the signal $x(n) = \delta(n-k)$, $k > 0$?
Option A:	$az=0$
Option B:	$z=\infty$
Option C:	Entire z-plane, except at $z=0$
Option D:	Entire z-plane, except at $z=\infty$
Q16.	The ROC of the z-transform of the causal signal $x(n) = (5/2)^n u(n) - (7/2)^n u(n)$ is
Option A:	$ z > 5/2$
Option B:	$ z < 7/2$
Option C:	$5/2 < z < 7/2$
Option D:	$ z > 7/2$
Q17.	What is the set of all values of z for which X(z) attains a finite value?
Option A:	Radius of convergence
Option B:	Radius of divergence

Option C:	Feasible solution
Option D:	None of the mentioned
Q18.	Final value of $X(Z) = \frac{Z(Z-2)}{(Z-1)(Z-0.5)}$ is
Option A:	0
Option B:	-1
Option C:	1
Option D:	-2
Q19.	Find the Z-transform of $\delta(n+3)$.
Option A:	Z_{-}
Option B:	Z^2_{-}
Option C:	1_{-}
Option D:	Z^3
Q20.	Fourier series coefficients for even symmetric periodic signal $x(t)$ is
Option A:	$a_k = 0, b_k = \text{present}$
Option B:	$a_k = \text{present}, b_k = 0$
Option C:	$a_k = b_k = 0$
Option D:	$a_k = b_k = \text{present}$
Q21.	Fourier transform of $x(t) = \text{tri}(t)$ is
Option A:	$\cos(f)$
Option B:	$\text{sinc}(f)$
Option C:	$\text{sinc}^2(f)$
Option D:	$\sin^2(-f)$

Q22.	DTFT of $x[n] = (\delta[n+1] + \delta[n-1])$ is
Option A:	$2\cos\omega$
Option B:	$-2\cos\omega$
Option C:	$\cos\omega$
Option D:	$-\cos\omega$
Q23.	Power spectrum describes distribution of _____ under frequency domain.
Option A:	Mean
Option B:	Variance
Option C:	Gaussian
Option D:	None of the mentioned
Q24.	The cross-correlation between two sequences of $x_1(n)=\{1,2,3,4\}$ origin at 1 and $x_2(n)=\{3,2,1,0\}$, origin at 3, is
Option A:	$\{0,1,4,10,16,17,12\}$, origin at 10
Option B:	$\{0,1,4,10,16,17,12\}$, origin at 16
Option C:	$\{0,1,4,10,16,17,12\}$, origin at 0
Option D:	$\{0,1,4,10,16,17,12\}$, origin at 4
Q25.	Aliasing error occurs when
Option A:	Sampling frequency f_s is less than $2w$
Option B:	Sampling frequency f_s is equal to $2w$
Option C:	Sampling frequency f_s is greater than $2w$
Option D:	Sampling frequency f_s is equal to $2w$ & greater than $2w$