University of Mumbai

Examination 2020 under cluster 5 (APSIT)

Program : BE Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 12 (CBSGS)

Examination: Second Year Semester IV

Course Code: ETC 405 and Course Name: Signals and Systems

Time: 1 hour Max. Marks: 50

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

Q1.	The type of systems which are characterized by input and the output quantized at certain levels are called as
Option A:	analog
Option B:	Discrete
Option C:	continuous
Option D:	Digital
Q2.	The type of systems which are characterized by input and the output capable of taking any value in a particular set of values are called as
Option A:	Analog
Option B:	Discrete
Option C:	Digital
Option D:	Continuous
Q3.	A time invariant system is a system whose output
Option A:	increases with a delay in input
Option B:	decreases with a delay in input
Option C:	remains same with a delay in input
Option D:	vanishes with a delay in input
Q4.	A system is said to be defined as non causal, when
Option A:	the output at the present depends on the input at an earlier time
Option B:	the output at the present does not depend on the factor of time at all
Option C:	the output at the present depends on the input at the current time
Option D:	the output at the present depends on the input at a time instant in the future
Q5.	If x (-t) = -x (t) then the signal is said to be _____
Option A:	Even signal
Option B:	Odd signal
Option C:	Periodic signal
Option D:	Non periodic signal
Q6.	When x(t) is said to be non periodic signal?
Option A:	If the equation x (t) = x (t + T) is satisfied for all values of T
Option B:	If the equation x (t) = x (t + T) is satisfied for only one value of T
Option C:	If the equation x (t) = x (t + T) is satisfied for no values of T
Option D:	If the equation x (t) = x (t + T) is satisfied for only odd values of T
Q7.	Y (t) = x (2t) is _____
Option A:	Compressed signal

Option B:	Expanded signal
Option C:	Shifted signal
Option D:	Amplitude scaled signal by a factor of 2
Q8.	Check whether x [n] = 7 sin (6πn) is periodic and if it is period calculate its fundamental period?
Option A:	Periodic with fundamental period 6π
Option B:	Periodic with fundamental period 3
Option C:	Periodic with fundamental period 1
Option D:	Non periodic
Q9.	y(t) = sin(x(t-1)): Comment on its memory aspects.
Option A:	Having memory
Option B:	Needn't have memory
Option C:	Memoryless system
Option D:	Time invariant system
Q10.	Which of the following systems is stable?
Option A:	y(t) = log(x(t))
Option B:	y(t) = sin(x(t))
Option C:	y(t) = exp(x(t))
Option D:	y(t) = t x(t) + 1
Q11.	The signal $x(t) = e^{j(2t+\pi/4)}$ is _____
Option A:	Energy signal with $E\infty = 2$
Option B:	Power signal with $P\infty = 2$
Option C:	Power signal with $P\infty = 1$
Option D:	Energy signal with $E\infty = 1$
Q12.	The range for unit step function for u(t – a), is _____
Option A:	$t < a$
Option B:	$t \leq a$
Option C:	$t = a$
Option D:	$t \geq a$
Q13.	Find the convolution sum of sequences $x_1[n] = (1, 2, 3)$ and $x_2[n] = (2, 1, 4)$.
Option A:	{2, 5, 12, 11, 12}
Option B:	{2, 12, 5, 11, 12}
Option C:	{2, 11, 5, 12, 12}
Option D:	{-2, 5,-12, 11, 12}
Q14.	The impulse response h (t) of an LTI system is given by $e^{-2t}.u(t)$. What is the step response?
Option A:	$y(t) = 1/2\ (1 - e^{-2t})\ u\ (t)$
Option B:	$y(t) = 1/2\ (1 - e^{-2t})$
Option C:	$y(t) = (1- e^{-2t})\ u\ (t)$
Option D:	$y(t) = 1/2\ (e^{-2t})\ u\ (t)$

Q15.	Convolve the signals e^{-2t} u(t), e^{-3t} u(t). Determine the output?
Option A:	$y(t) = (e^{-2t} – e^{-3t})u(t)$
Option B:	$y(t) = (e^{-2t} – e^{-3t})$
Option C:	$y(t) = (e^{-3t} – e^{-2t})u(t)$
Option D:	$y(t) = (e^{-t} – e^{-3t})u(t)$
Q16.	Determine the Nyquist rate of the signal $x(t) = 1 + \cos 2000\pi t + \sin 4000\pi t$.
Option A:	2000 Hz
Option B:	4000 Hz
Option C:	1 Hz
Option D:	6000 Hz
Q17.	Which of the following is the process of ‘aliasing’?
Option A:	Peaks overlapping
Option B:	Phase overlapping
Option C:	Amplitude overlapping
Option D:	Spectral overlapping
Q18.	Find the Fourier transform of $x(t) = f(t – 2) + f(t + 2)$.
Option A:	$2F(\omega)\cos 2\omega$
Option B:	$F(\omega)\cos 2\omega$
Option C:	$2F(\omega)\sin 2\omega$
Option D:	$F(\omega)\sin 2\omega$
Q19.	For a stable system which of the following is correct?
Option A:	$\|z\| < 1$
Option B:	$\|z\| = 1$
Option C:	$\|z\| > 1$
Option D:	$\|z\| \neq 1$
Q20.	Given $x(t)=e^{-t}$ u(t). Find the inverse Laplace transform of e^{-3s} X(2s).
Option A:	$1/2\ e^{-(t-3)/2}$ u(t+3)
Option B:	$1/2\ e^{-(t-3)/2}$ u(t-3)
Option C:	$1/2\ e^{(t-3)/2}$ u(t-3)
Option D:	$1/2\ e^{(t-3)/2}$ u(t+3)
Q21.	The inverse Z-transform of $z/(z+1)^2$ is _____
Option A:	$(-1)^{n+1}$
Option B:	$(-1)^{n-1}$ n
Option C:	$(-1)^{n-1}$
Option D:	$(-1)^{n+1}$ n
Q22.	Where does the gibbs phenomenon occur?
Option A:	Gibbs phenomenon occurs near points of discontinuity
Option B:	Gibbs phenomenon occurs only near points of discontinuity
Option C:	Gibbs phenomenon occurs only ahead of points of discontinuity
Option D:	Gibbs phenomenon does not occur near points of discontinuity

Q23.	The Fourier transform of u (t) is B (jω) and the Laplace transform of u (t) is A(s). Which of the following is correct?
Option A:	$B(j\omega) = A(s)$
Option B:	$A(s) = 1/s$ but $B(j\omega) \neq 1/j\omega$
Option C:	$A(s) \neq 1/s$ but $B(j\omega) \neq 1/j\omega$
Option D:	$A(s) \neq 1/s$ but $B(j\omega) = 1/j\omega$
Q24.	For which of the following a Fourier series cannot be defined?
Option A:	3 sin (25t)
Option B:	4 cos (20t + 3) + 2 sin (710t)
Option C:	exp(-|t|) sin (25t)
Option D:	1
Q25.	How is time shifting represented in case of periodic signal?
Option A:	If x(t) is shifted to t_0, Xn is shifted to t_0
Option B:	$x(t-t_0)$, $Yn = Xn\ e^{-njwt_0}$
Option C:	$Xn = x(t-t_0)$, $Yn = Xn\ e^{-njwt_0}$
Option D:	$Xn = x(-t_0)$, $Yn = Xn\ e^{-njwt_0}$