

UNIT WISE QUESTION BANK

Serial Number	Short answer Question	Blooms Taxonomy	Level
UNIT-III			
Signal Transmission through Linear Systems			
1	Define continuous time and discrete time systems.	Understand	3
2	Define time invariant and time varying systems.	Understand	3
3	Define static and dynamic systems.	Understand	3
4	Define causal and non-causal systems.	Understand	3
5	Define Linear and non linear systems.	Understand	3
6	Define Stable and unstable systems.	Understand	3
7	What is the period T of the signal $x(t) = 2\cos(n/4)$?	Knowledge	3
8	Is the system $y(t) = y(t-1) + 2t y(t-2)$ time invariant ?	Understand	3
9	Is the discrete time system describe by the equation $y(n) = x(-n)$ causal or non causal? Why?	Understand	3
10	What is the periodicity of $x(t) = e^{j100\pi t}$?	Understand	3
11	Define LTI CT, LTI DT systems	Understand	3
12	Define LTV CT, LTV DT systems	Knowledge	3
13	What is the condition of LTI system to be stable?	Understand	3
14	When the LTICT system is said to be causal?	Understand	3
15	When the LTICT system is said to be dynamic?	Understand	3
16	Define impulse response of a linear time invariant system.	Knowledge	3
17	Find the unit step response of the system given by $h(t) = 1/RC e^{-t/RC} u(t)$	Understand	3
18	What is the impulse response of the system $y(t) = x(t-t_0)$	Understand	3
19	What are the Conditions for a System to be LTI System?	Understand	3
20	Define transfer function in CT systems.	Knowledge	3
21	What is a filter? How they are classified?	Understand	3
22	The impulse response of the LTI-CT system is given as $h(t) = e^{-t} u(t)$. Determine transfer function and check whether system is causal and stable series?	Understand	3
23	What is signal bandwidth and system bandwidth?	Understand	3
24	State Paley-Wiener criterion?	Understand	3
25	What is the relation between bandwidth and rise time?	Understand	3
26	Define convolution integral.	Understand	3
27	What are the properties of convolution?	Understand	3
28	Determine the convolution of the signals $X(n) = \{2, -1, 3, 2\}$ & $h(n) = \{1, -1, 1, 1\}$	Understand	3
UNIT - III			
Signal Transmission through Linear Systems			
1.	Determine whether the following input-output equations are linear or non linear. a) $y(t) = x(t^2)$ b) $y(t) = e^{x(t)}$ c) $y(t) = t^2 x(t-1)$ d) $y(t) = x(t) \cos 50\pi t$	Understand	3

2.	Find whether the following systems are causal or non-causal a) $y(t)=x(-t)$ b) $y(t)=x(t+10)+x(t)$ c) $y(t)=x(\sin(t))$ d) $y(t)=x(t) \sin(t+1)$	Understand	3
3.	Determine whether the following systems are time-varying or time-invariant a) $y(t)=tx(t)$ b) $y(t)=t^2 x(t-1)$ c) $y(t)=a[x(t)]^2+bx(t)$ d) $y(t)=x(t) \cos 50\pi t$	Understand	3
4.	Show that the following systems are LTI systems a) $y(t)=x(t/4)$ b) $y(t) = x(t) + x(t-4) \quad t > 0$ $= 0 \quad t < 0$	Understand	3
5.	Find whether the following systems are stable or unstable a) $y(t)=ex(t); x(t) < 10$ b) $y(t)=(t+10) u(t)$	Understand	3
6.	Write notes on filter characteristics of linear systems.	Understand	3
7.	Obtain the conditions for distortion less transmission through a system.	Understand	3
8.	Derive the relation between rise time and bandwidth of a low pass filter	Understand	3
9.	Write short notes on a) signal bandwidth b) system bandwidth	Understand	3
10.	Explain causality and physical realizability of a system and hence give Paley-wiener criterion.	Understand	3
11.	Find the voltage of the RC LPF for an input voltage of $t e^{-at}$	Apply	3
12.	The impulse response of a continuous time system is expressed as $h(t)=1/RC e^{-t/RC} u(t)$. find the frequency response and plot the magnitude and phase plots.	Understand	3
13.	A system produces an output of $y(t)= e^{-t} u(t)$ for an input of $x(t)= e^{-2t} u(t)$. Determine the impulse response and frequency response of the system	Understand	3
14.	The input voltage to an RC circuit is given as $x(t)=t e^{-t/RC} u(t)$ and the impulse response of this circuit is given as $h(t)=(1/RC) e^{-t/RC} u(t)$. Determine the output $y(t)$	Understand	3
15.	For a system excited by $x(t)=e^{-2t} u(t)$, the impulse response is $h(t)=e^{-t} u(t)+e^{2t} u(-t)$, find the output $y(t)$ for this system	Understand	3
16.	Consider a causal LTI system with frequency response $H(\omega)=1/3+j\omega$ For a particular input $x(t)$, the system is observed to produce the output, $y(t)=e^{-3t} u(t)- e^{-4t} u(t)$, find the input $x(t)$?	Apply	3
17.	Determine the convolution of two functions $x(t)=a e^{-at}$; $y(t)= u(t)$	Apply	3
18.	Write the procedure to find the convolution of two signals graphically.	Understand	3

