BE Semester-7_IT_ Question Bank

(Digital Signal Processing)

1	Explain : 1. Discrete–time signals. 2. Discrete–time systems. 3. Discrete-time LTI systems. 4. Discrete-time systems described by differential equations.
2	Write short note on Implementation of discrete-time systems
3	Explain in brief Correlation of discrete-time systems
4	What is Z-Transform? Explain Properties of Z-transform in detail.
5	Explain in brief Analysis of LTI systems in Z-domain.
6	Explain : 1. Rational Z-transform 2. Inverse Z-transform 3. one-sided Z-transform
7	Differentiate between Continuous time signals and Discrete-time signals.
8	Explain characteristics of LTI systems in Frequency domain.
9	An LTI system has impulse response $h(n) = 5\ (-1/2)^n u(n)$. Determine Fourier Transform to find the output of this system when the input is $x(n) = (1/3)^n u(n)$.
10	Determine the inverse z-transform of the function $x(z) = \frac{z}{z - 0.5}$, $\lvert z \rvert > 0.5$
11	Obtain z- transform for (i) $x_1(n) = (1/2)^n u(n) + (2)^n u(n)$ (ii) $x_2(n) = -a^n u(-n-1)$. Plot pole –zero diagram and state ROC for both.
12	Describe any one type of DSP architecture.
13	An LTI system has impulse response $h(n) = 5\ (-1/2)^n u(n)$. Determine Fourier Transform to find the output of this system when the input is $x(n) = (1/3)^n u(n)$.
14	Define sampling. State and prove sampling theorem.
15	Explain an application of DSP in power electronics field.
16	Compare: (i) IIR vs FIR filter. (ii) Linear convolution vs Circular convolution.
17	Obtain relation between Z-transform and Fourier transform.
18	Sketch the following sequences: (i) $x(n) = \delta(n-2)$ (ii) $y(n) = 2\ u(-n+2)$ (iii) $z(n) = \{\delta(n-1) * \delta(n+1)\}$.

19	Draw the block diagram of basic hardware of signal processor and explain the same.
20	Describe the parallel form structure for 1st and 2nd sections for an LTI system.
21	Discuss aliasing and its remedies for the same
22	State and prove various properties of Z-transform.
23	Explain fixed point representation of binary numbers.
24	Describe concept of zero input limit cycle oscillation in detail.
25	Explain the concept of pipelining in DSP. Also discuss the need of interlocking in brief.
26	Define 1) Signal 2) System. Classify them.
27	State and prove Parseval's relation for DTFT
28	Define the following terms: 1) State space 2) Correlation 3) ROC 4) Sampling 5) Aliasing
29	Describe the properties of Discrete Fourier Transform (DFT).
30	Explain the structures for realization of FIR systems
31	Explain the structures for realization of IIR systems.
32	Explain Radix-2 FFT and DIT algorithm
33	For the system described by y(t) =x(2t) , determine whether the system is (i) Stable (ii) causal (iii) linear (iv) time – invariant and (v)memory less or not.
34	For H (z) = 2/(z+3), sketch Direct form - II and its transposed realization .
35	What are the different formats of fixed point representation? Explain the fixed point representation of binary numbers.
36	Write short note on **1.** TMS 320C40/50 **2.** Analog Devices.
37	Write short note on 1. Image processing, 2. Control
38	Explain applications of 1. Speech 2. Audio 3. Telecommunication
39	Explain the implementation Discrete Time Systems using Structure of FIR systems.
40	Explain Frequency analysis of signals using DFT and FFT algorithm.