Reg. No. : | | | | | | | | | | |

Question Paper Code: 46424

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Sixth Semester

Electrical and Electronics Engineering

14UEC624 - APPLIED DIGITAL SIGNAL PROCESSING

(Regulation 2014)

(Common to EIE and ICE branches)

Duration: 1:45 hour Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. List out the applications of digital signal processing.
2. What is aliasing? How can it be eliminated?
3. State the scaling property of the Z transforms.
4. Define discrete Fourier series.
5. What do mean by the term “bit reversal” as applied to FFT?
6. Define twiddle factor of FFT.
7. Give the steps in the design of a digital filter from analog filter.
8. Distinguish between FIR filters and IIR filters.
9. What is the principle feature of Harvard architecture?
10. Define pipelining.
11. List out the applications of digital signal processing.
12. Compare deterministic and random signals.

13. State Sampling Theorem.

14. Summarize three methods of doing inverse Z-transform.

15. Determine the spectra of the signals, $x_p(n) = \{1,1,0,0\}$ with period N=4.

PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

16. Show that unit impulse response can be used to obtain the response for any input for an LTI system. Also, determine whether the following systems are linear, time-invariant and causal.
    (i) $y(t) = x(t/3)$
    (ii) $y(n) = x(-n)$
    (iii) $y(t) = x(t^2)$
    (iv) $y(n) = x^2(2n)$ (10)

17. Using residue method find the inverse Z transform of
    $X(z) = [1 + 3z^{-1}] / [(1 +3z^{-1}+2z^{-2})]$, $|z| > 2$. (10)

18. Evaluate 8-point DFT of the following sequence using DIT-FFT
    x[n]={ 2, 1, 2, 1, 1, 2, 1, 2}. (10)

19. Design a digital low-pass Butterworth IIR filter using bilinear z-transform with a 3dB cut-off frequency of 2kHz and minimum attenuation of 30dB at 4.25kHz for a sampling rate of 10kHz. (10)

20. With a neat block diagram explain in detail about the architecture of TMS320C50. (10)