322631(22)

B. E. (Sixth Semester) Examination, 2020

(Old Scheme)

(CSE, IT Engg.)

DIGITAL SIGNAL PROCESSING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Part (a) of each question is compulsory. Attempt any two parts from (b), (c) & (d).*

Unit-I

1. (a)   Explain Signal.   2

   (b)   Explain Time domain representation of discrete time signal.   7

(c) Explain properties of fourier transform.   7

(d) What is energy & powers theorem.   7

Unit-II

2. (a) Explain sampling theorem.   2

(b) Explain discrete time processing of continuous time signal.   7

(c) How sampling rate can change using discrete time processing?   7

(d) How reconstruction of Band limited signal from its sample is possible.   7

Unit-III

3. (a) What is Z transform?   2

(b) Explain properties of region of convergence.   7

(c) Determine Z transform including the region of convergence of

$$x(n) = \begin{cases} a^n , & n \geq 0 \\ 0 , & n < 0 \end{cases}$$

(d) Determine the causal signal $x(n)$ having the z transform :   7

$$X(z) = \frac{1}{\left(1+z^{-1}\right)\left(1-z^{-1}\right)^2}$$

Unit-IV

4. (a) Explain properties of digital filter.   2

(b) Find the response of FIR filter with impulse response $h(n) = \{1,\ 2,\ 4\}$ to the input sequence $x(n) = \{1,\ 2\}$.   7

(c) Explain various application of DSP.   7

(d) Explain bilinear transformation methods for IIR filter design.   7

Unit-V

5. (a) Explain Bit reversal.   2

(b) Explain circulas & linear convolution using DFT.　7

(c) Given $x(n) = \{0, 1, 2, 3\}$ find $X(K)$ using DIT FFT algorithm.　7

(d) Explain decimation in frequency (DIF) algorithm.　7