Institute of Engineering and Technology

DAVV INDORE

II YEAR (CS) (A&B)

Subject code –CER4G2, Subject Name – Digital Signal Processing

Time: 70 Minutes Test # 2, May 2021 Maximum Marks: 20

Note: Attempt any four Questions and each Questions Carry equal marks.

Q.(1) (a) Determine the circular convolution of the following two sequences

$X(n) = \{3 , 5 , 2 , 4\}$; $h(n) = \{7 , 3 , 5 , 2\}$

(b) Using initial value theorem, find the initial value of $X(Z) = Z^2 + 2Z + 2 / (Z+1)(Z+0.5)$

Q.(2) (a) Find the Fourier series of $f(x) = x^3$, $[-\pi , \pi]$

(b) Find the complex exponential Fourier series representation of the following signal

(i) $x(t) = \sin(2t+\pi/4)$ (ii) $x(t) = \cos^2 t$

Q.(3) (a) Find the Fourier transform of $x(t) = 5 \sin^2(3t)$

(b) Find the Z transform of the finite sequence $X(n) = \{ 7 , 3 , 5 , \underset{\uparrow}{2} , 0 , 0 , 4 , 8 , 1\}$

Q.(4) (a) Find the Z transform of the signals $X(n) = [3(2)^n – 4(3)^n] u(n)$

(b) Find the inverse Z transform of $X(Z) = 3/3 + 3Z^{-1} – 2Z^{-2}$ When (i) ROC: $|Z| > 1$, (ii) ROC: $|Z| < ½$

Q.(5) (a) Find 4 point DFT of the sequence $x(n) = \{ 3 , 7 , 4 , 2 \}$

(b) Determine the IDFT of $X(K) = \{ 16 , -1 – 5j , -2 , -1 + 5j \}$