

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION-2021

B.Tech V Semester

COURSE CODE: 18B11EC511

MAX. MARKS: 35

COURSE NAME: Principles of digital signal processing

COURSE CREDITS: 04

MAX. TIME: 2 Hours

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1 Compute the periodic convolution of the signal $x_1(n) = [1\ 1\ 1\ 2\ 2]$, and $x_2(n) = [5\ 4\ 3]$. [5 Marks, CO-2]

Q.2 Find the linear convolution of the signal $x_1(n) = [1\ 1\ 1\ 2\ 2]$, and $x_2(n) = [1\ 2\ 3]$. [5 Marks, CO-1]

Q.3 Compute the 4 points discrete Fourier transform of signal $x(n) = [1\ 2\ 3\ 4]$ using decimation in time Fast Fourier Transform algorithms. [5 Marks, CO-2]

Q.4. Compute the 4 points discrete Fourier transform of signal $x(n) = \cos\left(\frac{n\pi}{2}\right)$ using decimation in frequency Fast Fourier Transform algorithms. [5 Marks, CO-2]

Q.5. Converts the analog IIR filter transfer function $H(s)$ into digital IIR filter transfer function $H(z)$ using impulse invariance method, where $H(s) = \frac{2}{(s+1)(s+2)}$, $T=1$ s. [5 Marks, CO-3 &CO-5]

Q.6. Converts the analog filter transfer function $H(s)$ into digital transfer function $H(z)$ using bilinear transformation, where $H(s) = \frac{2}{(s+1)(s+3)}$, $T=0.1$ s. [5 Marks, CO-3 &CO-5]

Q.7. Determine the direct form-II of the transfer function $H(z) = \frac{(1-b\cos\omega_0 z^{-1})}{(1-2b\cos\omega_0 z^{-1}+b^2 z^{-2})}$ [5 Marks, CO-4]