

EC304 DIGITAL SIGNAL PROCESSING

TIME: 1.5 Hrs

Maximum Marks:20

Note: Attempt all questions. Each question carries equal marks

- 1) Z-transform of a sequence $x(n) = X(z) = \frac{z+2z^{-2}+z^{-3}}{1-3z^{-4}+z^{-5}}$. If ROC includes unit circle, then find the DTFT of $x(n)$ at $w=\pi$.
- 2) An input $x(n) = 3^n u(-n)$ is applied to a system having $h(n) = 0.5^n u(n)$. Find the output $y(n)$ of the system.
- 3) Compute linear convolution from circular convolution of signals $x(n) = [2,1,2,1]$ and $h(n) = [1,2,3,4]$. Realise the filter using Direct form I.
- 4) Compute 8-point DFT of $x(n) = [1,6,3,5,2,8,6,3]$ using DIF FFT algorithm.
- 5) Compute the filter output $y(n)$, if $h(n) = [1,2]$ and $x(n) = [1,2,3,4,5,6,7,8,9]$ by using overlap and add method.

END