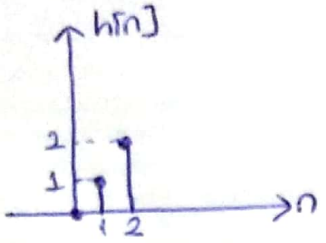
BME3161 BIOSIGNAL PROCESSING

HW-2

Q1-



a) Find the $\mathcal{Z}$ transform of the $h[n]$ signal ($H(\mathcal{Z}) = ?$).

b) Plot the pole-zero diagram of $H(\mathcal{Z})$ and explain what is the filter type (Low pass- high pass- band pass etc.) Explain whether the system is FIR or IIR.

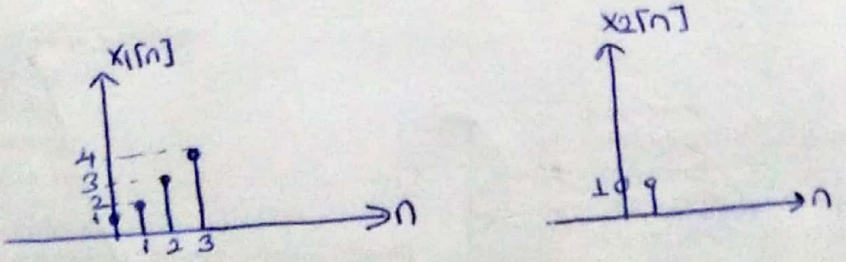
c) $$X(\mathcal{Z}) = \frac{1}{(1-3\mathcal{Z}^{-1}+2\mathcal{Z}^{-2})\mathcal{Z}^{-1}}$$

Find the system output ($y[n]$) using $X(\mathcal{Z})$ and $H(\mathcal{Z})$ signal. (Use IZT partial fractions to do this).

Q2- $x[n] = (0.2)^n \cdot u[n-4] + (0.4)^{n-1} u[n]$

Find the frequency response ($X(e^{j\omega})$) of the system using Discrete-Time Fourier Transform (DTFT).

Q3-



Find $x_1[n] \textcircled{N} x_2[n]$ (circular convolution).

$N = 4$

(Use zero padding for $x_2[n]$.)