

$$3) x[n] = \begin{cases} (-1)^n n, & n=1,2,3 \\ 0, & \text{otherwise} \end{cases}$$

$$y[n] = \sum_{k=-\infty}^{\infty} x[n+7k], \quad N=7$$

$$E_x = \sum_{n=-\infty}^{\infty} |x[n]|^2 = 1+4+9 = 14$$

$$P_x = \lim_{N \rightarrow \infty} \frac{1}{2N+1} \sum_{n=-N}^N |x[n]|^2 = \lim_{N \rightarrow \infty} \frac{1}{2N+1} (14) = 0$$

$$E_y = \infty \text{ since } y \text{ is periodic}$$

$$P_y = \frac{1}{N} \sum_{n=0}^{N-1} |y[n]|^2 = \frac{1}{7} E_x = \frac{1}{7} (14) = 2$$

$$4) x[n] = \delta[n] + 2\delta[n-1] + 3\delta[n-2]$$

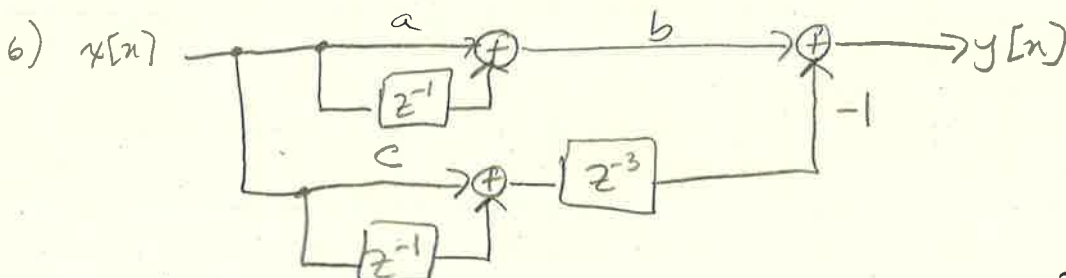
$$y[n] = \frac{1}{2} (x[n] + x[n-1])$$

$$= \frac{1}{2} (\delta[n] + 2\delta[n-1] + 3\delta[n-2] + \delta[n-1] + 2\delta[n-2] + 3\delta[n-3])$$

$$= \frac{1}{2} (\delta[n] + 3\delta[n-1] + 5\delta[n-2] + 3\delta[n-3])$$

$$5) t = 120s, \quad f_s = 44100 \frac{1}{s}$$

$$N = (44100 \frac{1}{s}) (120s) = 5292000$$



$$y[n] = b(a x[n] + x[n-1]) - (c x[n-3] + x[n-4])$$

$$7) e^{j(M/N)2\pi n} = x[n]$$

$$a) M=1, N=3 \quad M/N = 1/3$$

$$b) M=5, N=7 \quad M/N = \frac{5}{7}$$

$$c) M=35, N=15 \quad M/N = \frac{35}{15} = \frac{7}{3}$$

$$a) x[n] = e^{j \frac{2\pi}{3} n}, \quad p = 3$$

$$b) x[n] = e^{j \frac{10\pi}{7} n}, \quad p = 7$$

$$c) x[n] = e^{j \frac{14\pi}{3} n}, \quad p = 3$$