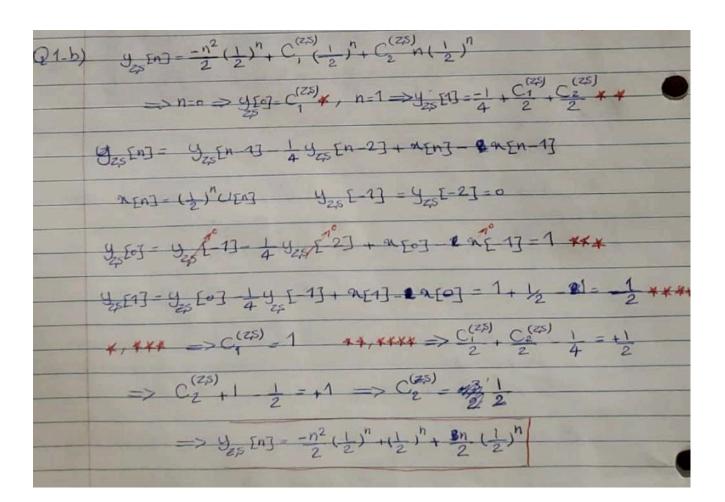
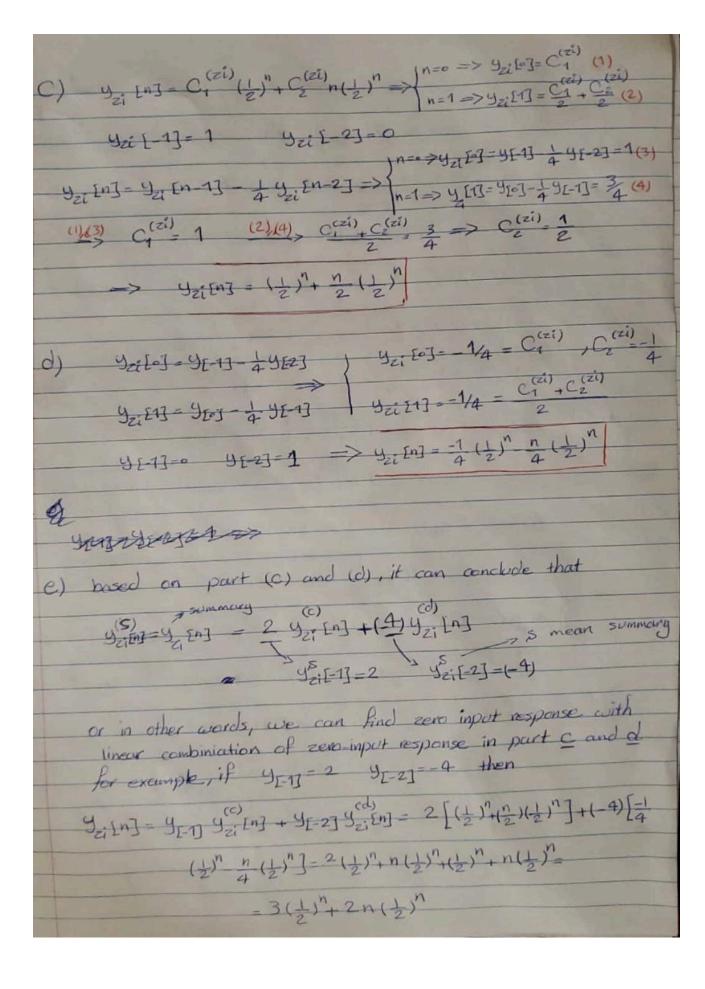
Q1a)	MENJ (1/2)"UENJ > UpEnj - K(1/2)" based on handart
	but because 1, -1, -1 then ypen3 = kn2(1)n
	4pm-4pm-13+44pm-23 - 20m3 e 20m-13 n>2
	n=2 => 4p[2] -4p[1]+ 4 4p[0] = n[2] - n[1]
	9p[2]-K(2)212-K, 4p[1]-K(1)1-K
	$91[2] = (\frac{1}{2})^2 = \frac{1}{4}$ , $11[1] = (\frac{1}{2})^1 = \frac{1}{2}$





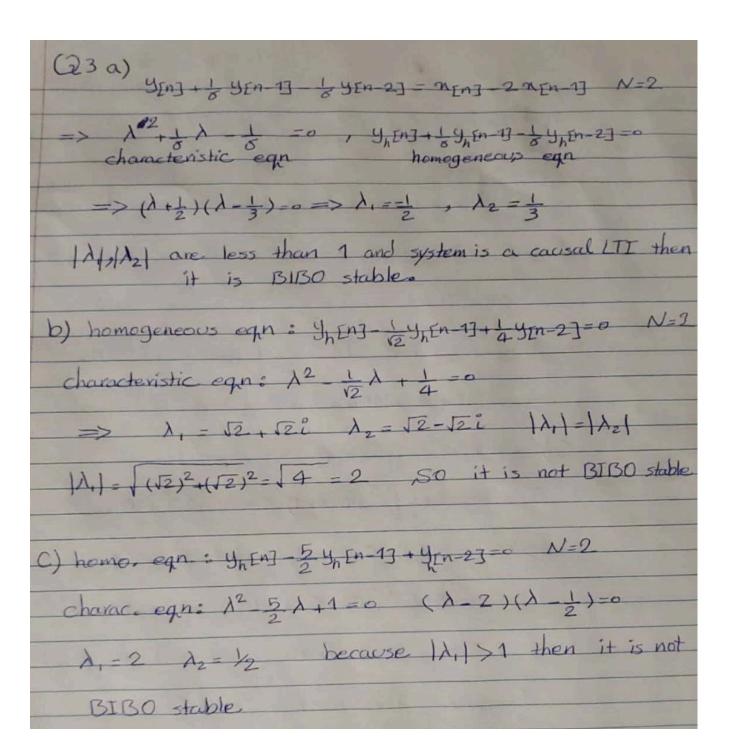
f) y=13=1 4[=2]=1 x[n]= (=)"[[[n] the total solution yeng, no can be land as the sum of => 4 zi [n] = 4[-1] 4(c) [n] + 4[-2] 4(d) [n] 9: [n] = 3 (1)" + n (1)" Uzs = part b  $9En = \frac{3}{4} \left(\frac{1}{2}\right)^{n} + \frac{n}{4} \left(\frac{1}{2}\right)^{n} - \frac{n^{2}}{2} \left(\frac{1}{2}\right)^{n} + \left(\frac{1}{2}\right)^{n} + \frac{8n}{2} \left(\frac{1}{2}\right)^{n}$ Um = 7 (1) 1 30 n(1) 1 n2 (1) n 9E03= 7 V 9E1 = 7 + 3 - 1 - 1 V 9E2 = 7 + 6 4 - 5 V  $9[3] = \frac{7}{32} + \frac{9}{32} - \frac{9}{16} = \frac{-2}{32} = \frac{-1}{16} \vee$ 9) YENT - YEN-1] - 4 YEN-2] + NEM - NEN-1] n=0=>4[0]=4[1]-44[-2]+2[0]-2[-1]=1-4+1=7/ n=1 => y[1] = y[0] - 4 y[-1] + x[1] - x[0] = 7 + 1 - 1 = 1 = 1 - 1 n=2 => 4[2] = 4[1] - 4 4[2] - 7[1] = 1 - 7 + 1 - 1 = 5 / both methods have the same result.

Q2.a) h[n] - 3 h[n-1] + 1 h[n-2] - 2S[n] + 3S[n-1]

n=0 -> h[o] - 3 h[1] + 1 h[2] - 2S[2] + 3S[1] -> h[o]-2 n=1=>h[1]=3 h[3]-1 h[3]+28[3]+38[3] => h[1]=6 n=2 => h[2] = 3 h[1] - 1 h[0] +28[1] +38[1] => h[2]=8 n=3 => h[3]=9 b, - h2 - h, - 8 - 6 = 2 b3 - h4 - h3 = 9,5 - 9 = 1/2  $\sum_{i=0}^{n-1} b_i^* = h_{[n]} - h_{[o]} \qquad b_i^* = 2^{2i}$ =>  $\frac{\sum_{i=0}^{n-1} 2^{-i} - h_{[n]} - h_{[o]}}{\sum_{i=0}^{n-1} 2^{-i} + h_{[o]}} + h_{[o]} = h_{[n]} - 4 \sum_{i=0}^{n-1} 2^{-i} + h_{[o]}$  $=>h[n]=4(1-(1/2)^n)+2=8(1-(1/2)^n)+2=10-8(1/2)^n$ 

b) 
$$y_{step}[n] = S_{EN}$$
  $a_{EN} = U_{EN}$ 
 $S_{EN} = \frac{3}{2} S_{EN-1} + \frac{1}{2} S_{EN-2} + 2 U_{EN} + 3 U_{EN-1}$ 
 $n = 0 \Rightarrow S_{E3} = \frac{3}{2} S_{E3} = \frac{1}{2} S_{E3} + 2 U_{E3} + 3 U_{E3} = 2$ 
 $n = 1 \Rightarrow S_{E3} = \frac{3}{2} S_{E3} = \frac{1}{2} S_{E3$ 

SEN 13=  $8(\frac{1}{2})^{n-1}$  +  $10(n-1)-6=16(\frac{1}{2})^n$  + 10n-16  $= > h_{[n]} = 8(\frac{1}{2})^n + 10n-6 - (16(\frac{1}{2})^n + 10n-16)$   $= 8(\frac{1}{2})^n + 10n-6 - (16(\frac{1}{2})^n + 10n+16 = 10-8(\frac{1}{2})^n$   $= 8(\frac{1}{2})^n + 10n-6 - 16(\frac{1}{2})^n + 10n+16 = 10-8(\frac{1}{2})^n$   $= 8(\frac{1}{2})^n + 10n-6 - 16(\frac{1}{2})^n + 10n+16 = 10-8(\frac{1}{2})^n$   $= 8(\frac{1}{2})^n + 10n-6 - (16(\frac{1}{2})^n + 10n-16)$   $= 8(\frac{1}{2})^n + 10n-16$   $= 8(\frac{1}{2})^n + 1$ 



Q4-a) cos 0 - et +e 92: [n] = 5(1)" cos (2171 n+ TZ) = 5(1)" (e s) + e rs - 3) = (5) (3) ( e 12 m = 15 + e 12 m = - 15) = 5 e 1 ( 1 e 12 )" + 5 e - 1 ( 1 e 12 )" - C, ( ) ) + C2 ( )  $\lambda_1 = \frac{1}{3} (\cos \frac{\pi}{4} + J \sin \frac{\pi}{4}) = \frac{12}{5} + \frac{152}{5}$ b) (1-1,)(1-12)=0=>12-(1,+12)1+1,12=0 => 1, + 1/2 = 1/2 + 1/2 - 1/12 = 2/2 = 1/2 1. 12 = 1 e 5 1/4 = 1 e = 1 =>  $\lambda^2 \sqrt{2} \lambda + \frac{1}{9} = 0$  < charactristic eqn N=2 => 4, En] - 52 y, En-1] + 1 y, En-2] = 0 < homo. eqn. => a, = - \frac{12}{3} \alpha\_2 = 1/9