Q1.

a) Want $\langle z, d\rangle \neq 0$ and ≥ 0 $\langle z, e\rangle \geq 0$. , $e = \begin{pmatrix}0\\1\end{pmatrix}$

	$\langle z, d\rangle$	$\langle z, e\rangle$
i	1	0
ii	0	x
iii	1	1
iv	1	1

(x) ii

$\begin{pmatrix}0\\1\end{pmatrix}$ is not possible for this scenario, deals for infinite processor.

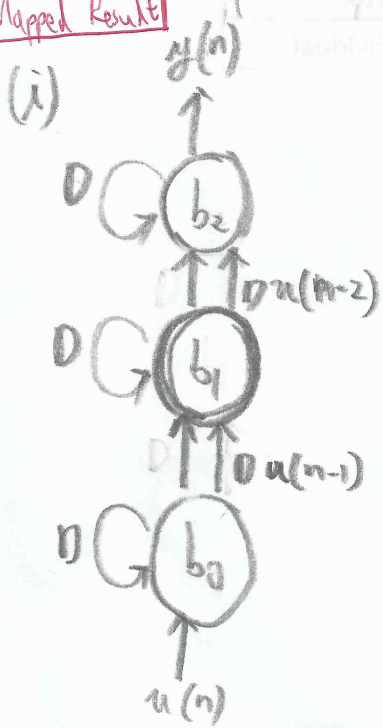
b) $\because M = \begin{pmatrix} z^T \\ P^T \end{pmatrix}$, find the correspondent M, s.t. $\langle P, d\rangle = 0$.

Arc Mapping

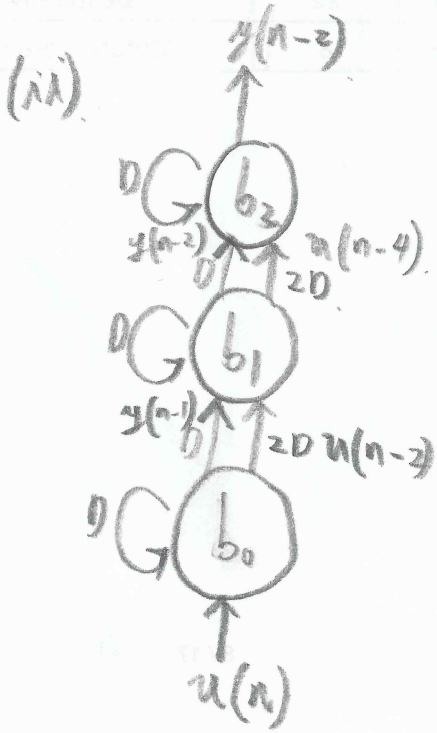
	P	d	z	M	$y = \begin{pmatrix}0\\1\end{pmatrix}$	$u = \begin{pmatrix}1\\1\end{pmatrix}$	$b = \begin{pmatrix}1\\0\end{pmatrix}$
i	$\begin{pmatrix}0\\1\end{pmatrix}$	$\begin{pmatrix}1\\0\end{pmatrix}$	$\begin{pmatrix}1\\0\end{pmatrix}$	$\begin{pmatrix}1&0\\0&1\end{pmatrix}$	$\begin{pmatrix}0\\1\end{pmatrix}$	$\begin{pmatrix}1\\1\end{pmatrix}$	$\begin{pmatrix}1\\0\end{pmatrix}$
ii	$\begin{pmatrix}0\\1\end{pmatrix}$	$\begin{pmatrix}1\\0\end{pmatrix}$	$\begin{pmatrix}1\\1\end{pmatrix}$	$\begin{pmatrix}1&1\\0&1\end{pmatrix}$	$\begin{pmatrix}1\\1\end{pmatrix}$	$\begin{pmatrix}2\\1\end{pmatrix}$	$\begin{pmatrix}1\\0\end{pmatrix}$
iii	$\begin{pmatrix}1\\0\end{pmatrix}$	$\begin{pmatrix}0\\1\end{pmatrix}$	$\begin{pmatrix}1\\1\end{pmatrix}$	$\begin{pmatrix}1&1\\1&0\end{pmatrix}$	$\begin{pmatrix}1\\0\end{pmatrix}$	$\begin{pmatrix}2\\1\end{pmatrix}$	$\begin{pmatrix}1\\1\end{pmatrix}$

Mapped Result

(i)



(ii)



(iii)