

Q#4

- i) $A - B$
ii) $A + B$

for cin as 1 \rightarrow Conditional Sum Adder
for (4 bit group) \rightarrow Carry Select Adder.

$$A = 1\ 0\ 0\ 1\ 1\ 0\ 1\ 1$$

$$B = 0\ 1\ 1\ 0\ 0\ 1\ 0\ 1$$

$$-B = 1\ 0\ 0\ 1\ 1\ 0\ 1\ 1$$

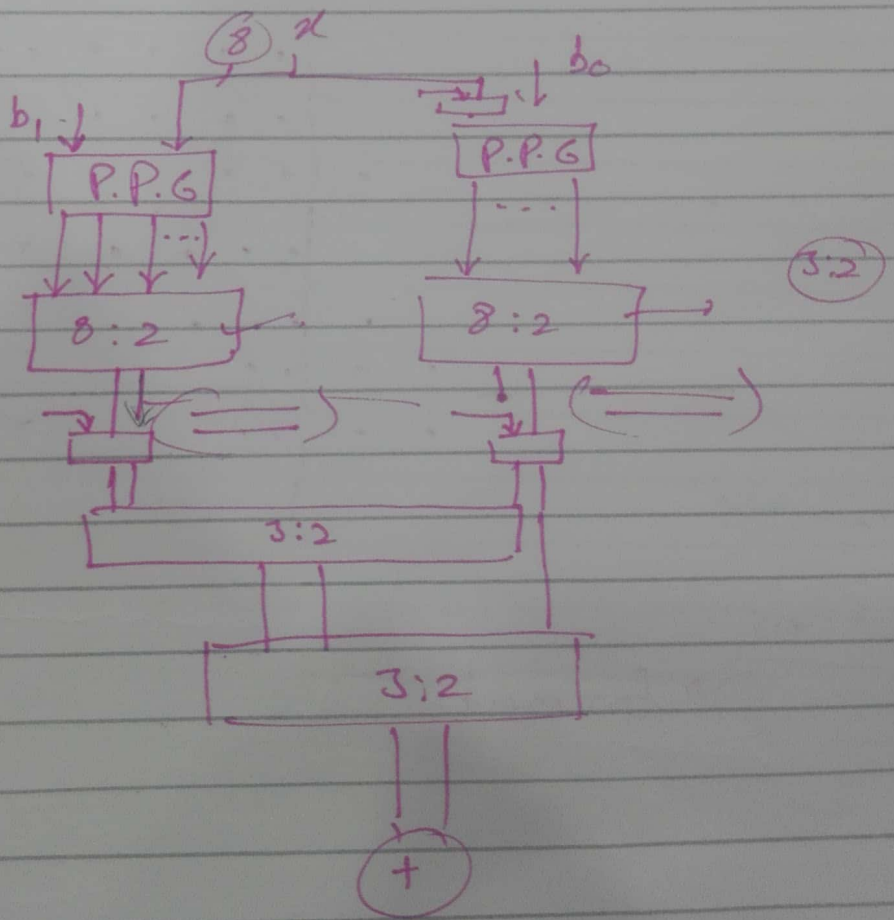
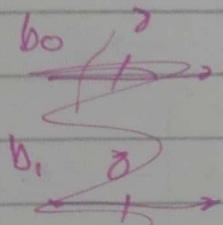
a)	1	0	0	1	1	0	1	1	
	1	0	0	1	1	0	1	1	
cin=1	1	1	1	1	1	1	1	1	S
	1	0	0	1	1	0	1	1	C
cin=0	0	0	0	0	0	0	0	0	S
	1	0	0	1	1	0	1	1	C
cin=1	0	1	1	1	0	1	1	1	S
	1	0	0	1	1	0	1	1	C
cin=0	0	0	1	0	0	0	0	0	S
	1	0	0	1	1	0	1	1	C
cin=1	0	0	1	1	0	1	1	1	S
	1	0	0	1	1	0	1	1	C
cin=0	0	0	1	0	0	0	0	0	S
	1	0	0	1	1	0	1	1	C
cin=1	0	0	1	1	0	1	1	1	S
	1	0	0	1	1	0	1	1	C
cin=0	0	0	1	0	0	0	0	0	S
	1	0	0	1	1	0	1	1	C
cin=1	0	0	1	1	0	1	1	1	S
	1	0	0	1	1	0	1	1	C
cin=0	0	0	1	0	0	0	0	0	S
	1	0	0	1	1	0	1	1	C
cin=1	0	0	1	1	0	1	1	1	S
	1	0	0	1	1	0	1	1	C

b.

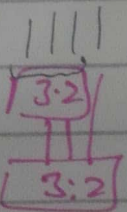
	①	①	①		①	①	①		
A	1	0	0	1	1	0	1	1	
B	0	1	1	0	0	1	0	1	
	1	1	1	1	0	0	0	0	cin=0
	0				1				c
	0	0	0	0	0	0	0	1	cin=1
	1				1				c

cin=0 0 0 0 0 0 0 0 0

cin=1 0 0 0 0 0 0 0 1



CRA



$$\underline{2+3+5}$$

2.3

777

0.5

Queries:-

$$x_2 < 0.33$$

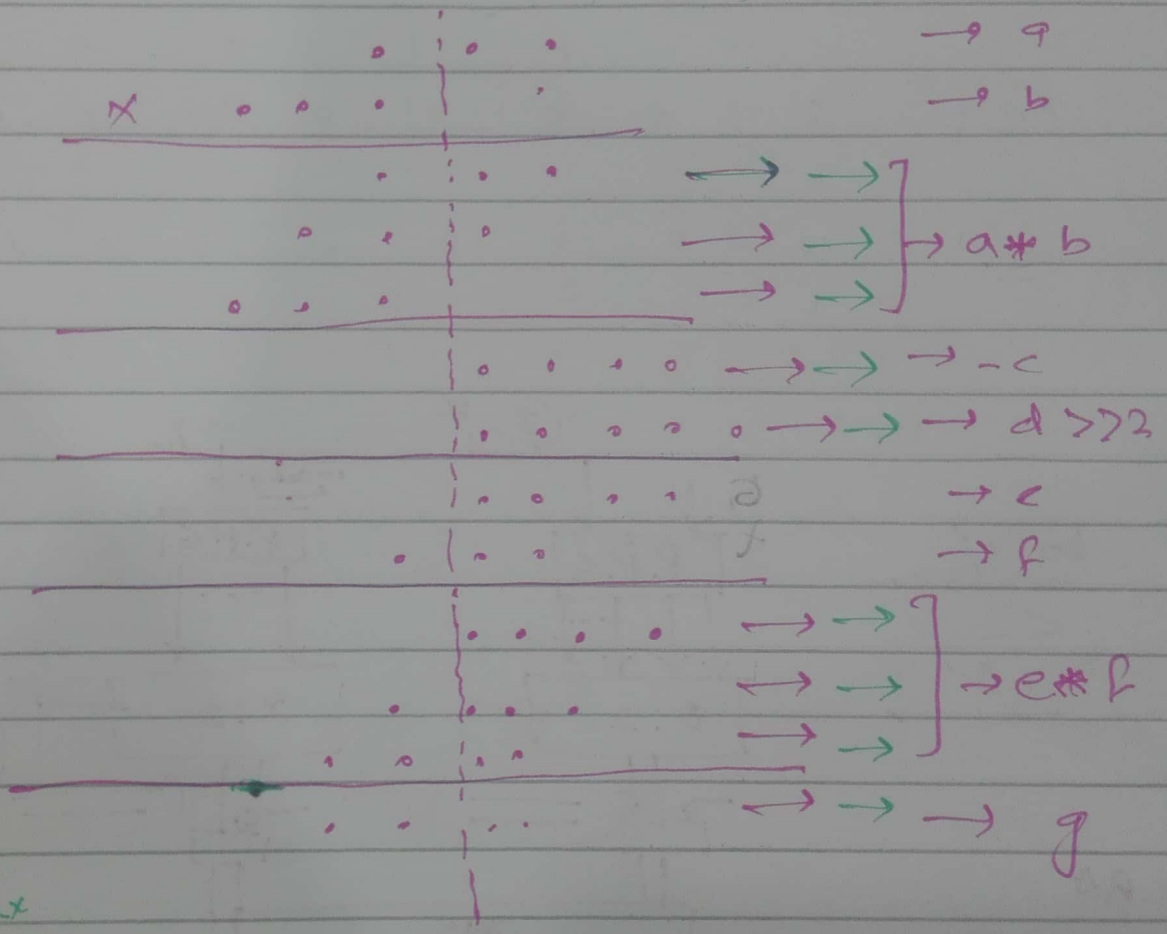
$$x_2 < 0.09$$

$$x_1 < 0.6$$

$$x_1 < 0.69$$

Root node:- Test with max. impurity decrease

Q:3)

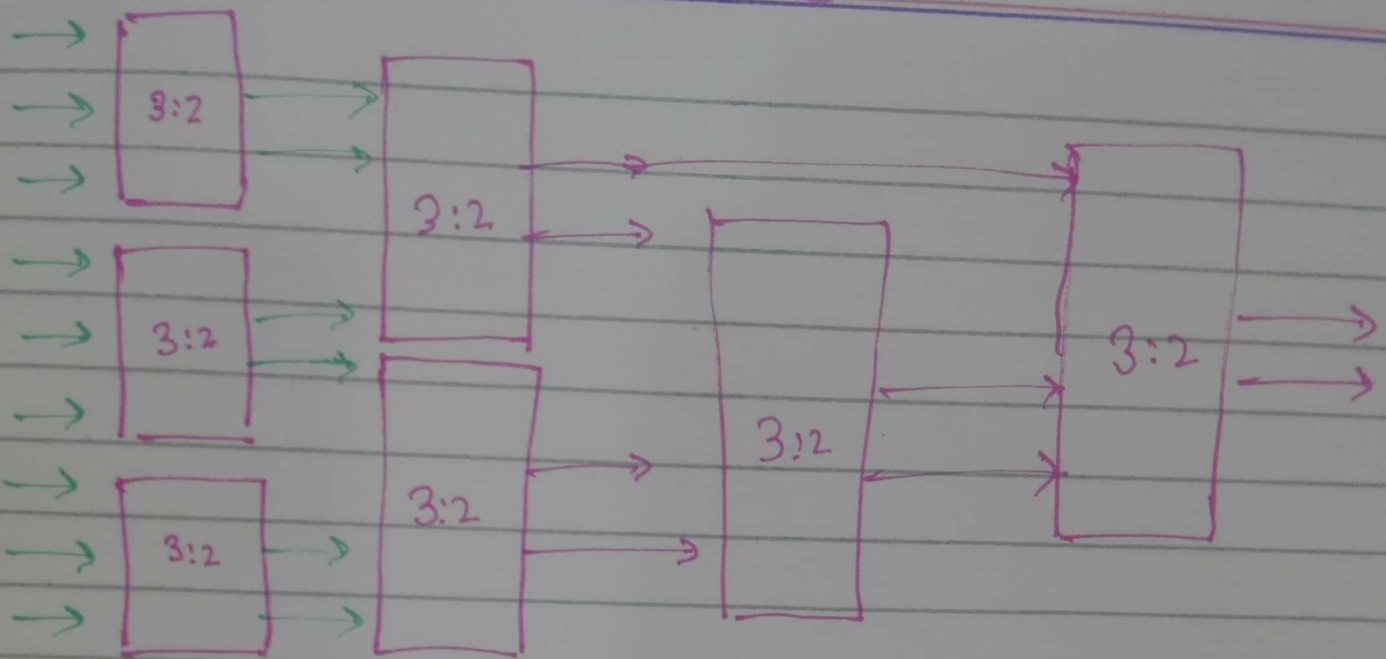


max-max

y → Q_{3.5}

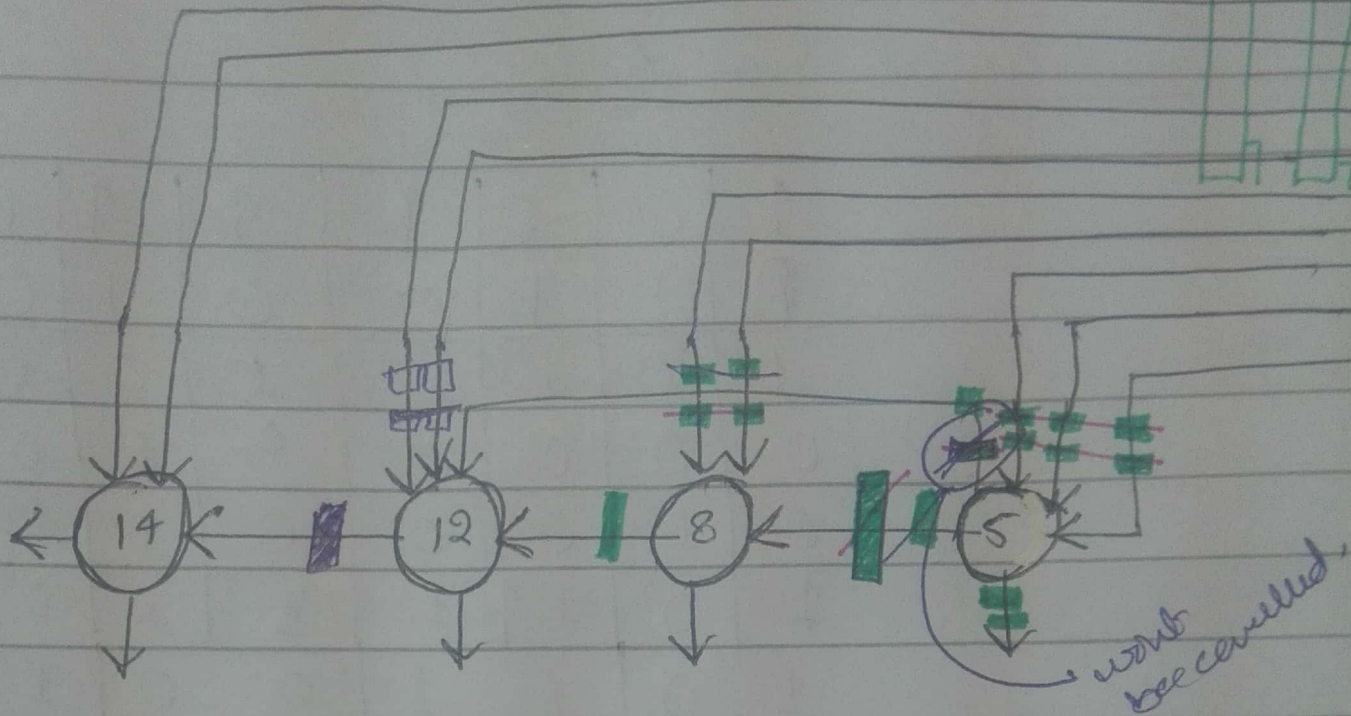
for mat

Wallace



Practice Questions

Q-13



$$C.P = 14 + 12 + 8 + 5$$

$$C.P = \text{Pipeline } (14 + 12)$$

Q-12

$$A = 1001_1101$$

$$B = 1101_1011$$

$$B' = 0010_0101$$

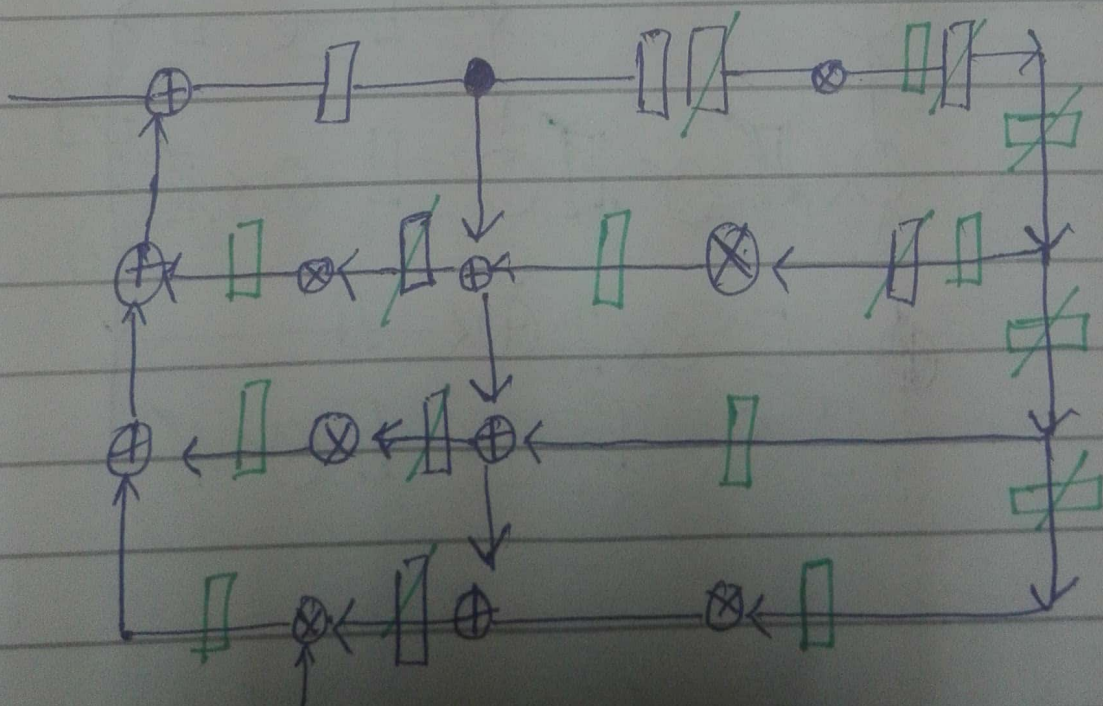
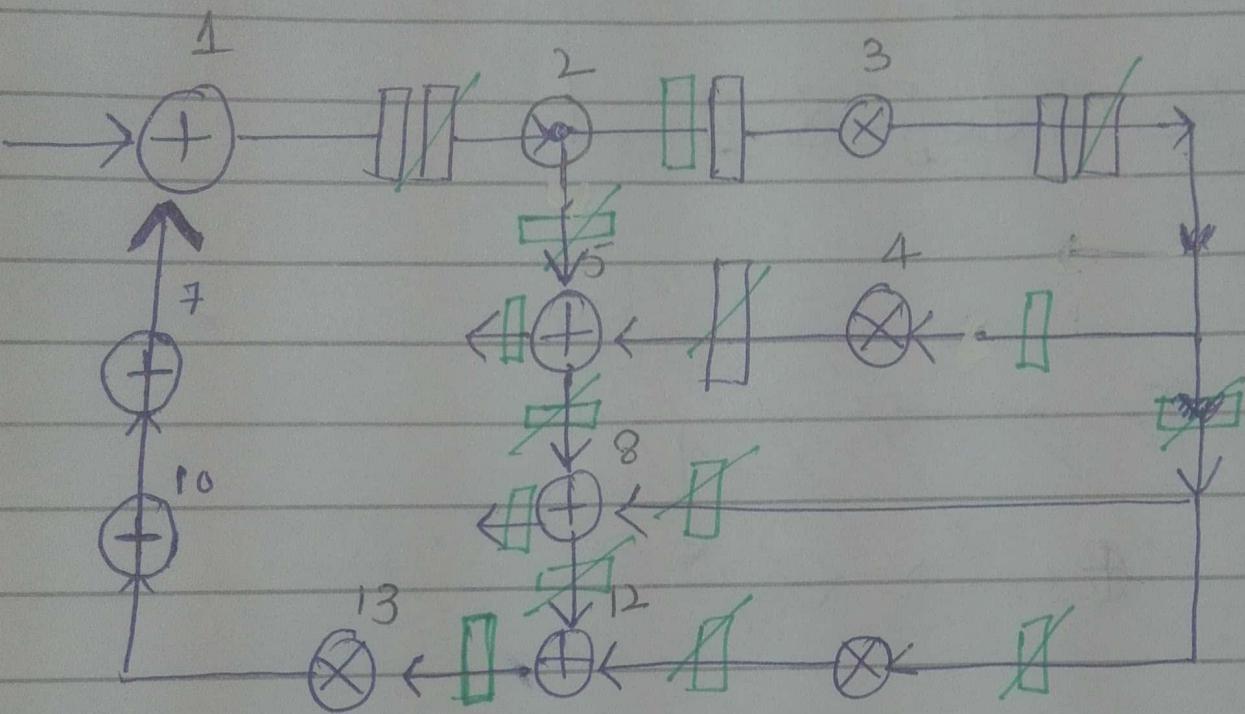
Conditional Sum Adder

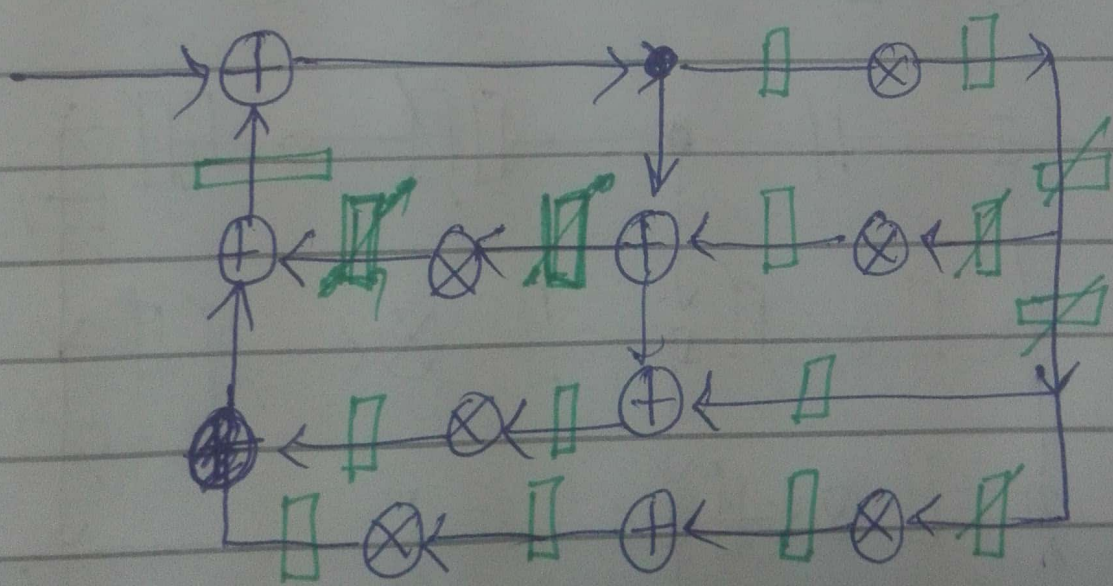
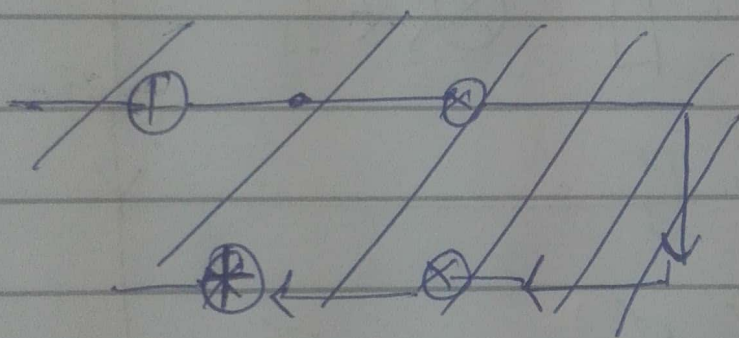
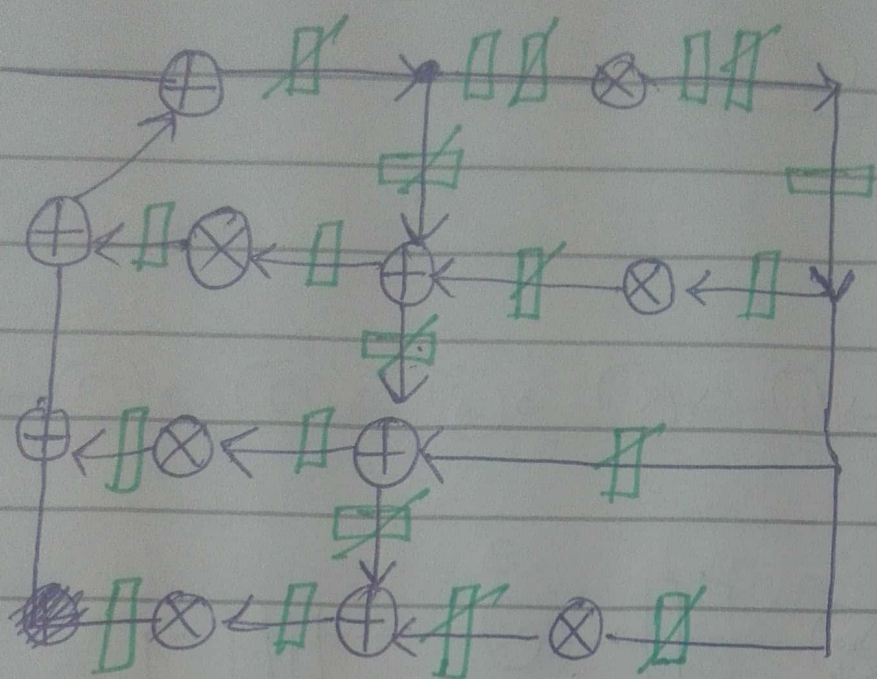
1	0	0	1	1	1	0	1	
0	0	1	0	0	1	0	1	
1	0	1	1	1	0	0	0	$S_{cin=0}$
0	0	0	0	0	1	0	1	S
0	1	0	0	0	1	1	1	$S_{cin=1}$
1	0	1	1	1	1	0	1	C
1	0	1	1	0	0	1	0	S
0		0		1		0		C
1	1	0	0	0	0	1	1	S_1
0		1		1		0		C
1	1	0	0	0	0	1	0	S
0				1				C
1	1	0	0	0	0	1	1	S_1
0		1		1				C

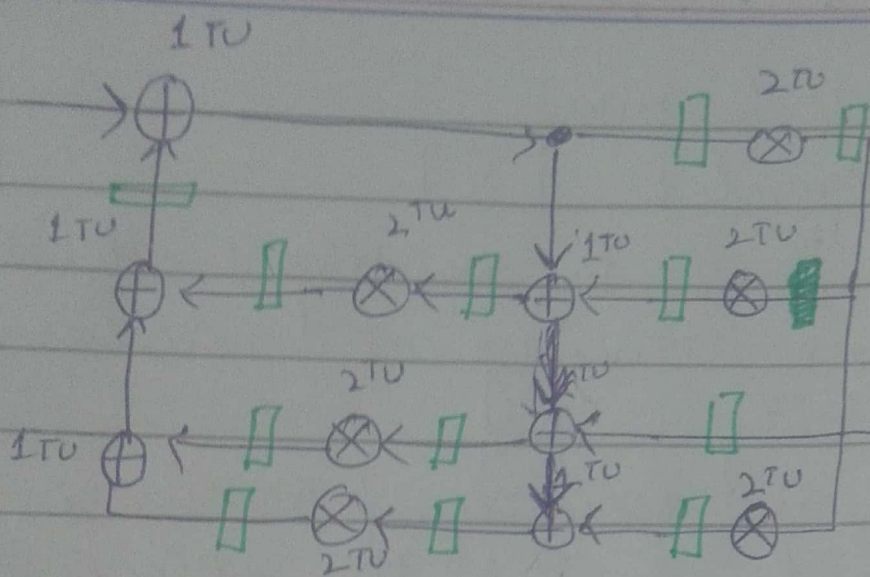
Q8

C.P Identify

→ ① → ③ → ④ → ⑤ → ⑧ → ⑫ → ⑬ → ⑩ → ⑨ →

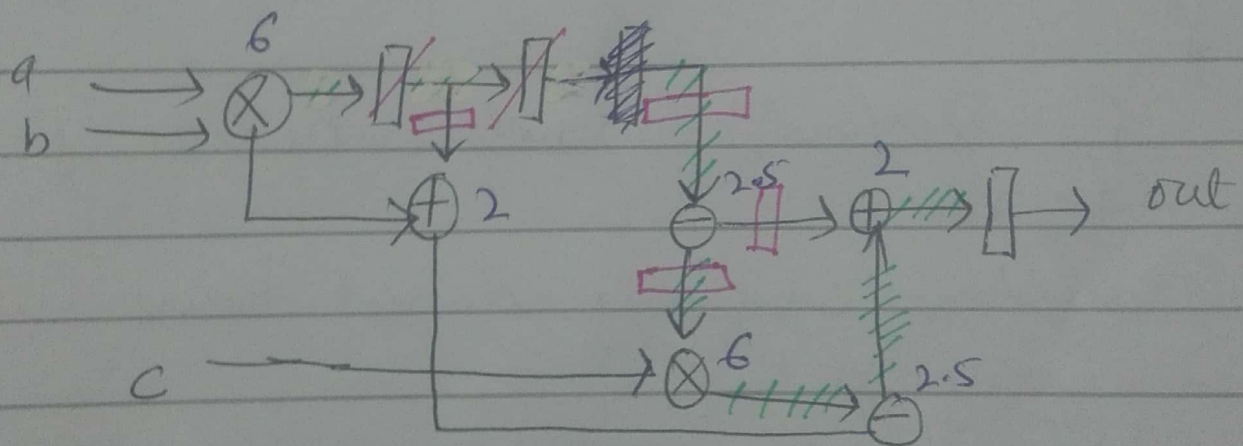






$$C.P = 3 TU$$

Q5



$$C.P = 6 \text{ A } 2.5 / \sqrt{6} + 2.5 + 2.5 / \sqrt{6} + 2$$

C.P

1/P → reg

reg 1/P → reg

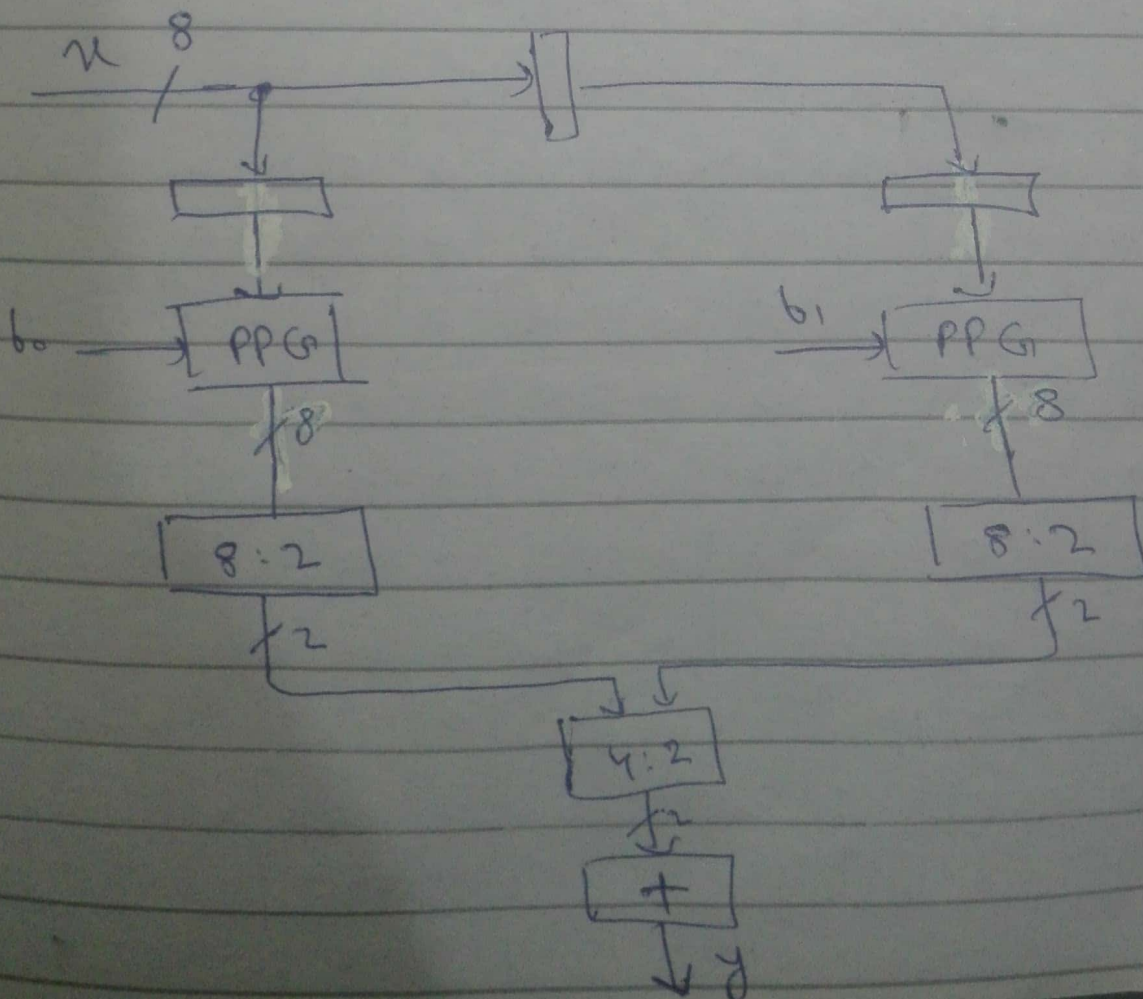
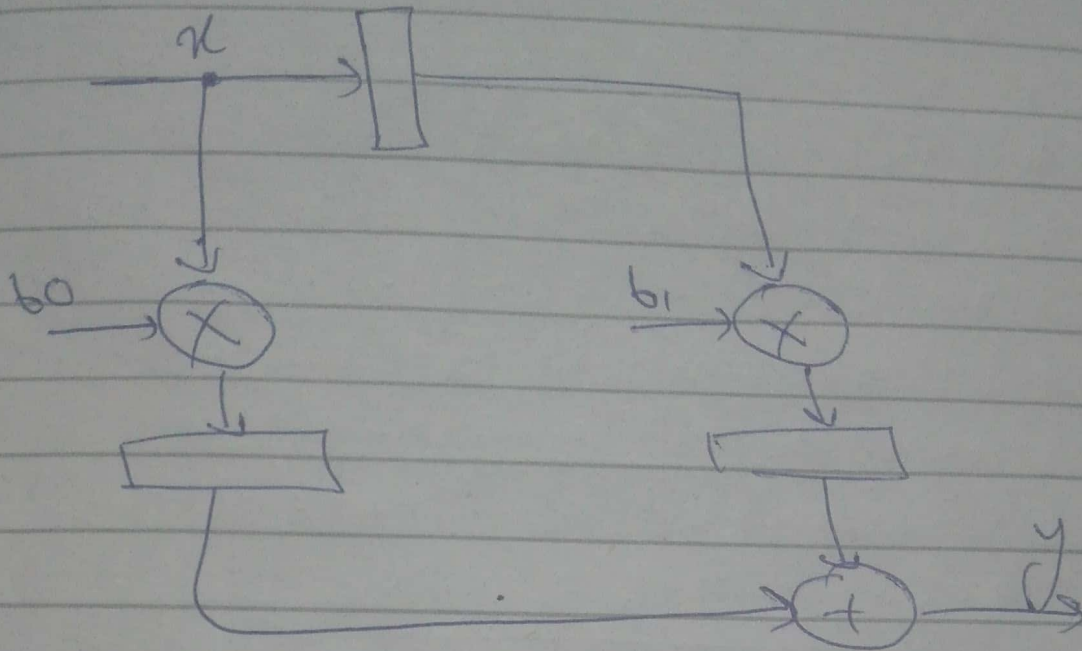
reg → of P.

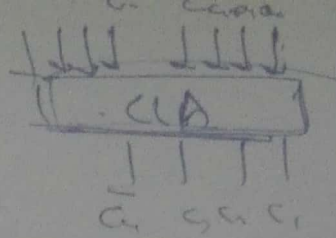
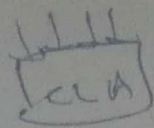
$$C.P = 2.5 + 6 + 2.5 + 2 = 13 TU$$

$$\text{After Pipes} = 8.5 TU.$$

DSD Practice Q;

Q#2 (a)





Q#4 (a) A-B using Conditional Sum Adder
cin = 1

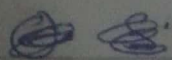
$$A = 1001 \ 1011$$

$$B = 0110 \ 0101$$

$$\overline{B} = 1001 \ 1010$$

1	0	0	1	1	0	1	1	
1	0	0	1	1	0	1	1	
0	0	0	0	0	0	0	/	S cin=0
1	0	0	1	1	0	1	/	C
1	1	1	1	1	1	1	1	S cin=1
1	0	0	1	1	0	1	1	C
0	0	1	0	0	0	/	/	S cin=0
1		0		1		/	/	C
0	1	1	1	0	1	1	1	S cin=1
1		0		1		1		C
0	0	1	0	/	/	/	/	S cin=0
1				/	/	/	/	C
0	0	1	1	0	1	1	1	S cin=1
1				1				C
0	0	1	1	0	1	1	1	
1								

Ans



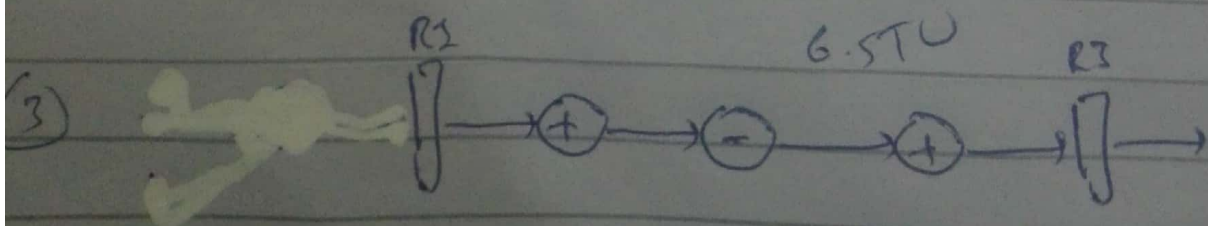
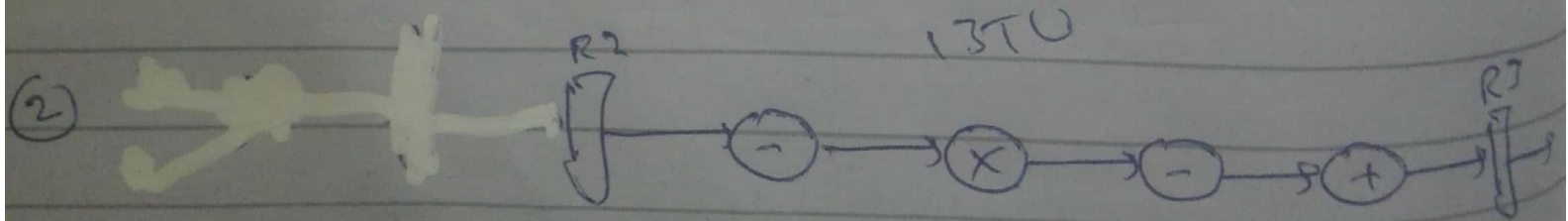
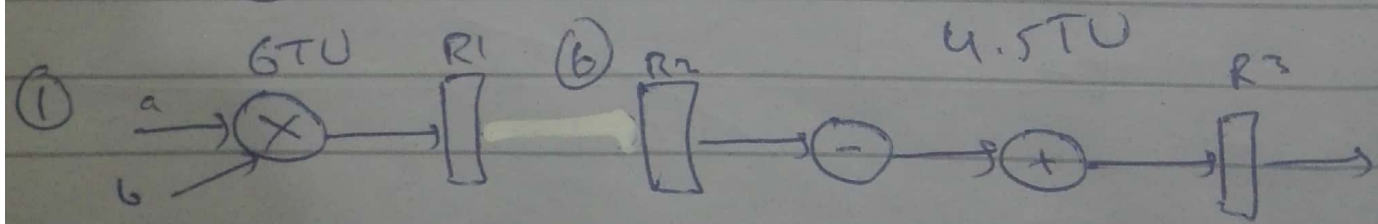
is A unsigned?

Q #5

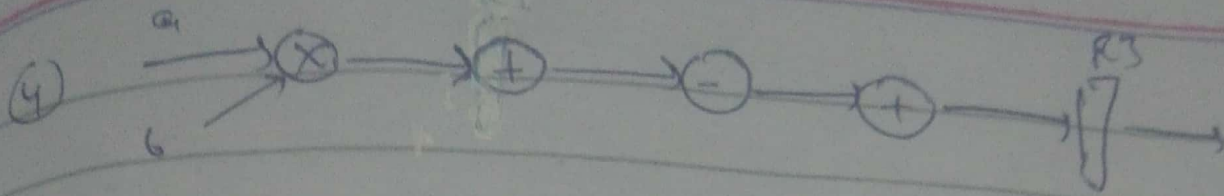
$$\textcircled{X} = 670$$

$$\textcircled{+} = 2TU$$

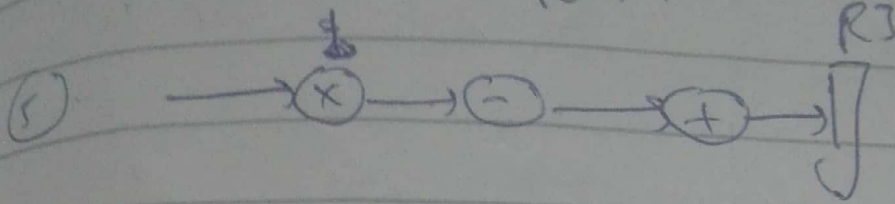
$$\textcircled{-} = 2.5 \text{ TV}$$



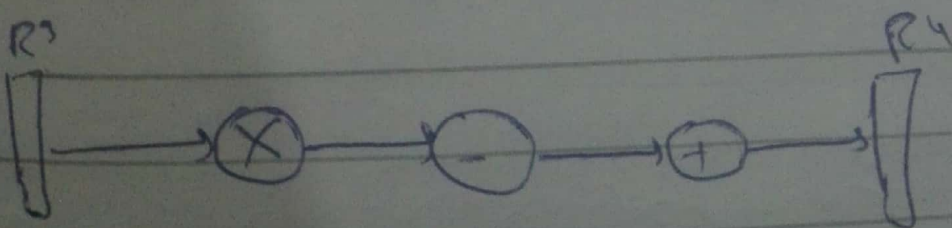
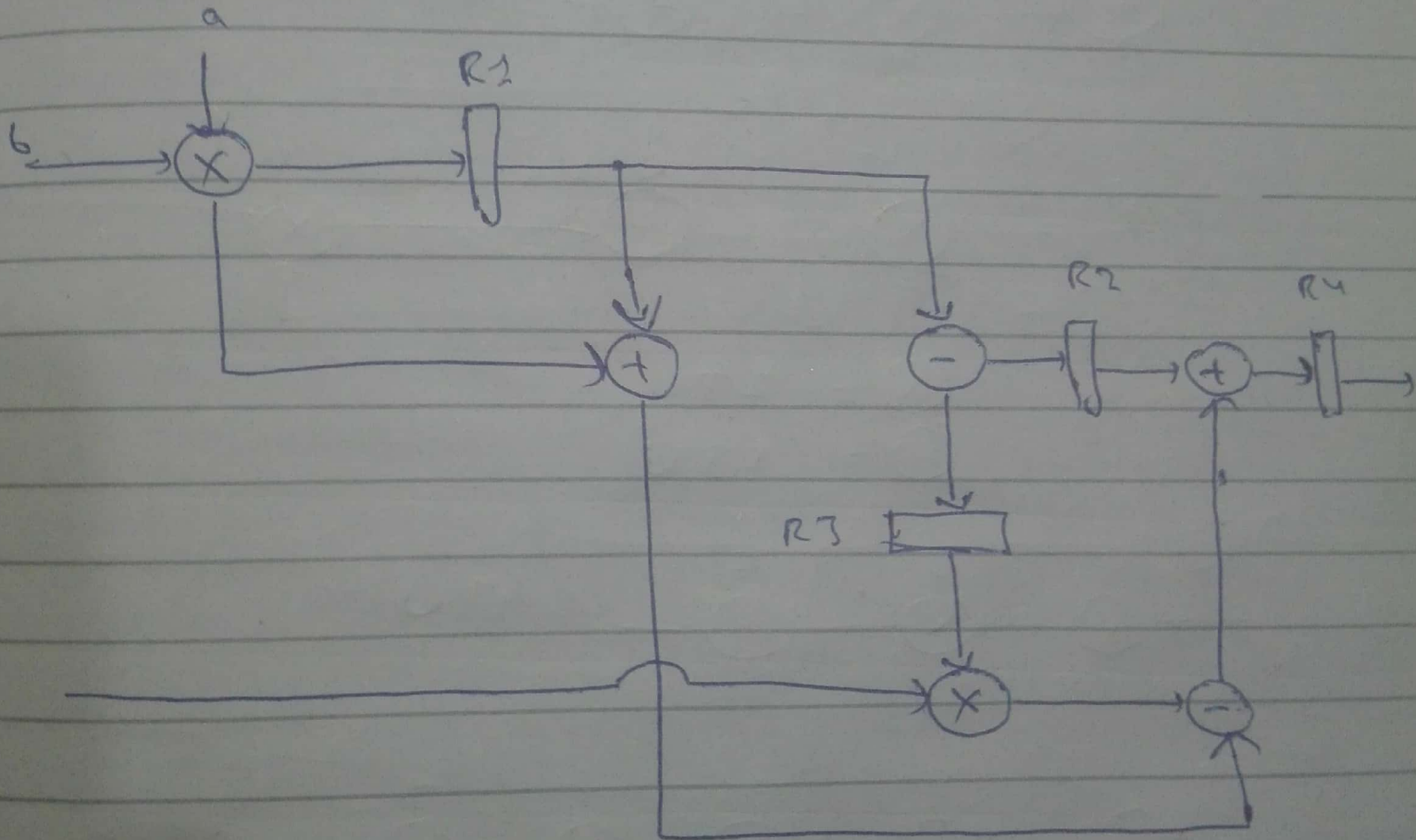
12.5 TU



10.5 TU



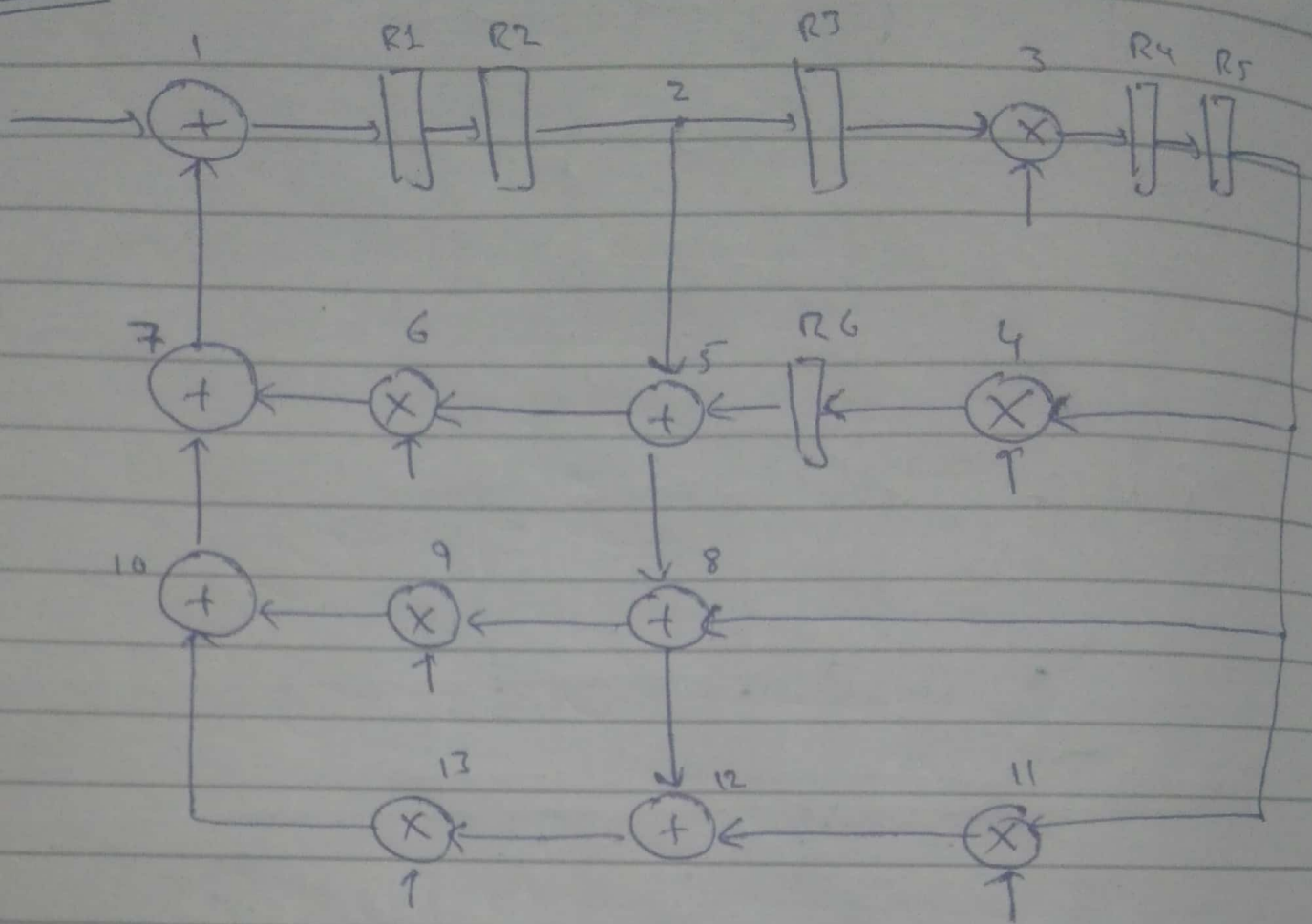
Path 2 is Critical Path



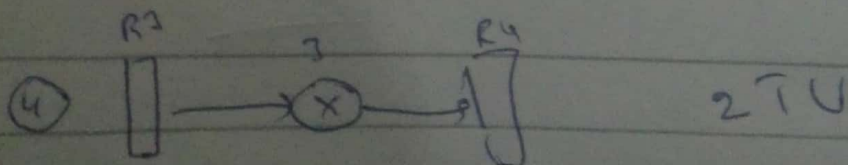
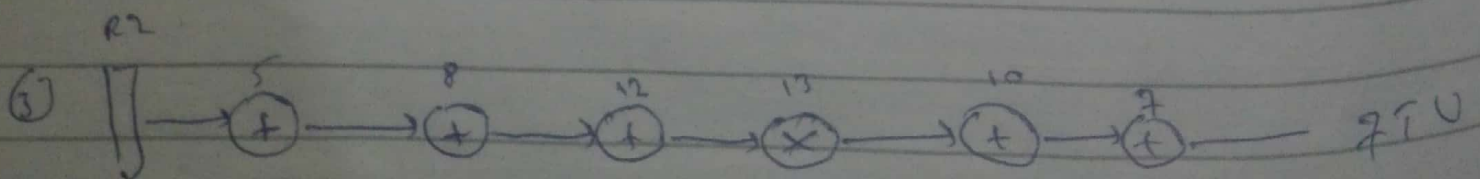
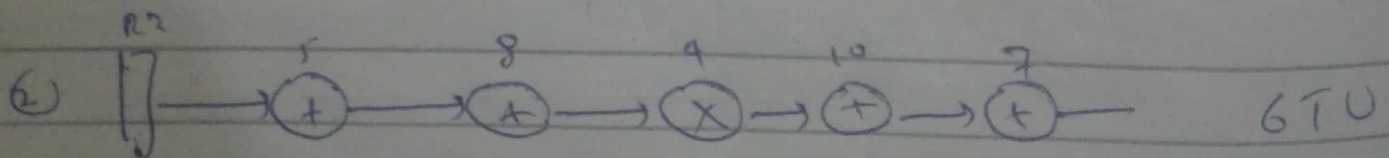
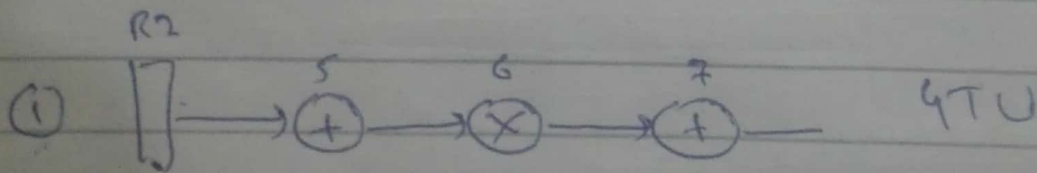
10.5 TU

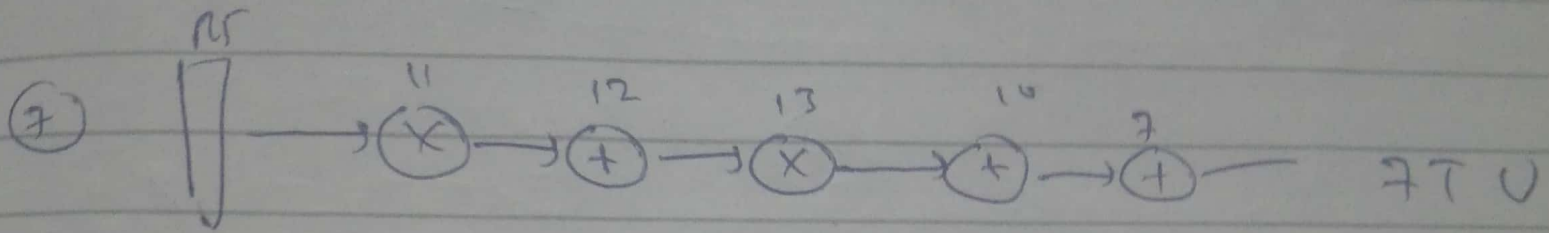
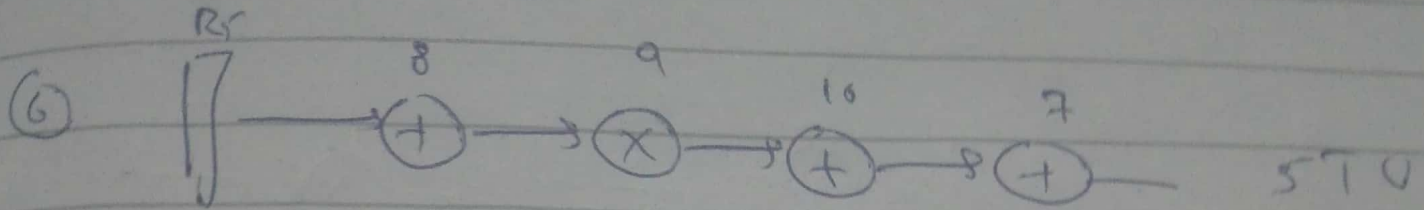
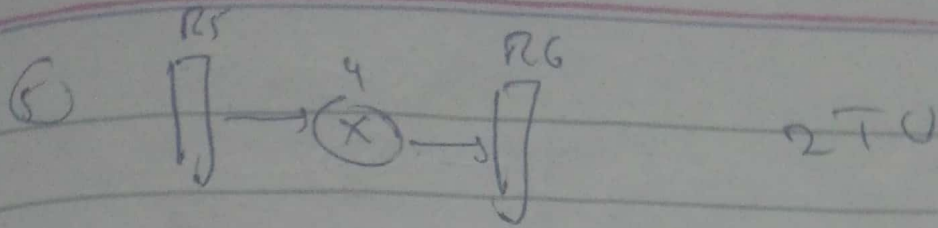
Ans

Q#8

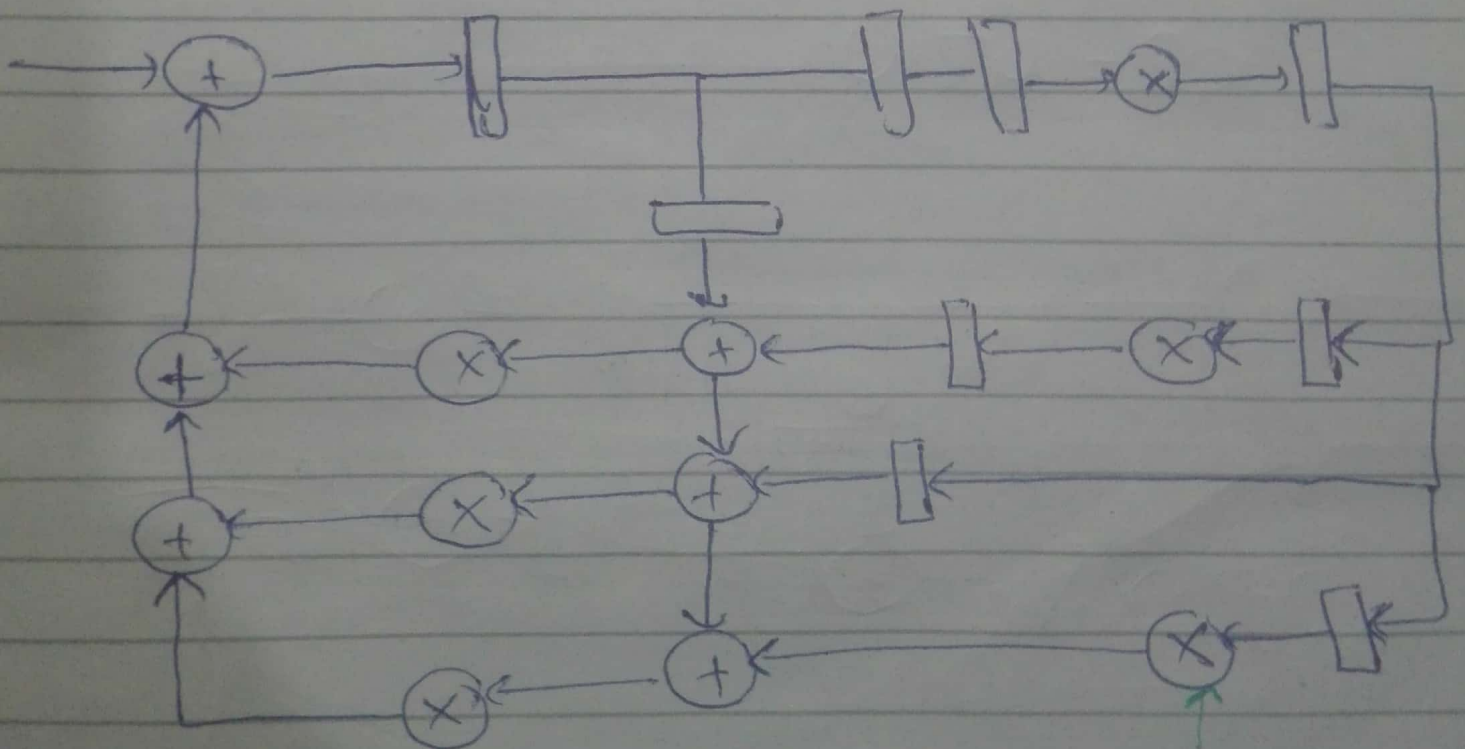


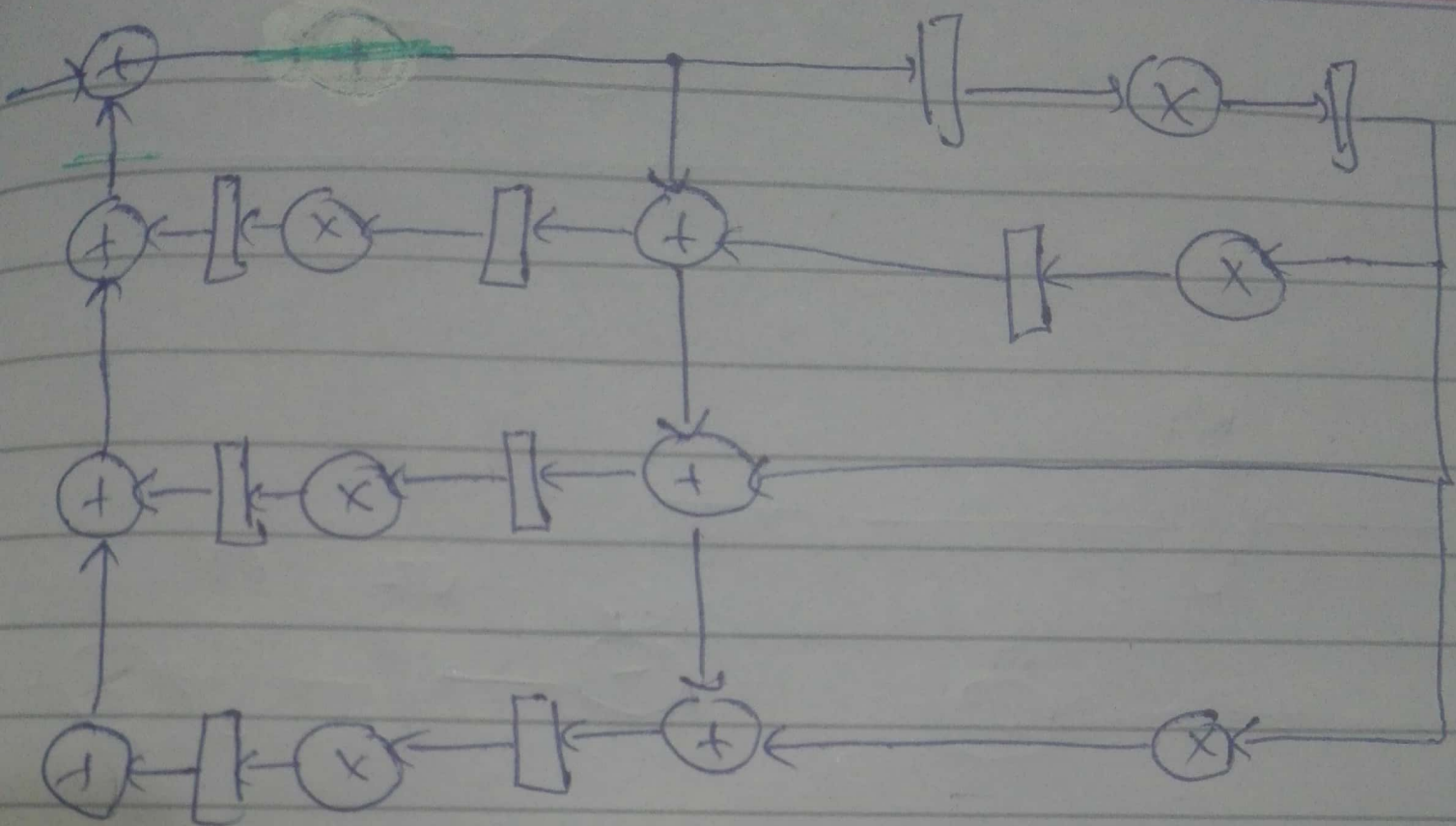
Assuming $\otimes = 2TU$
 $\oplus = 1TU$





③ & ⑨ are CP's.

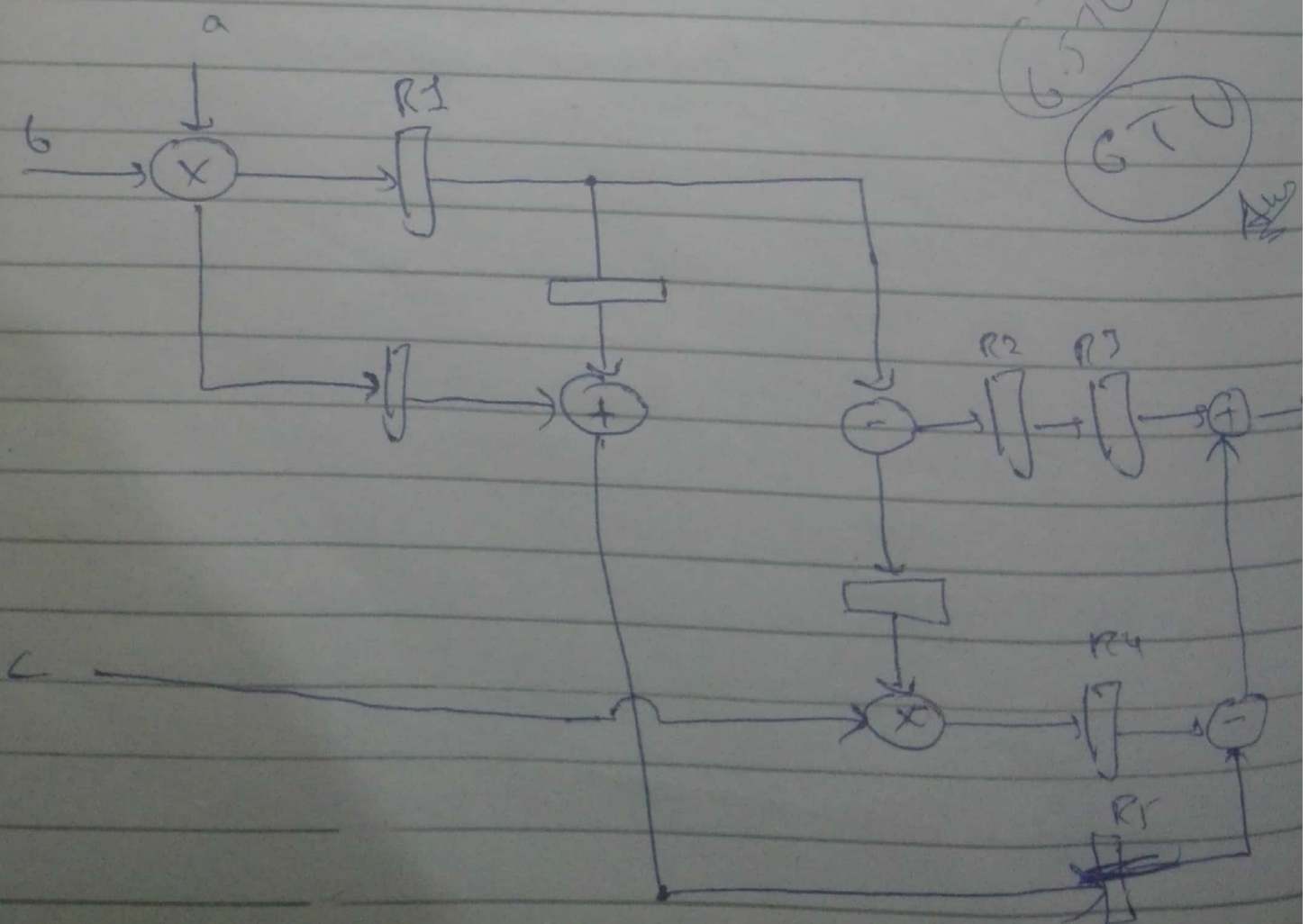
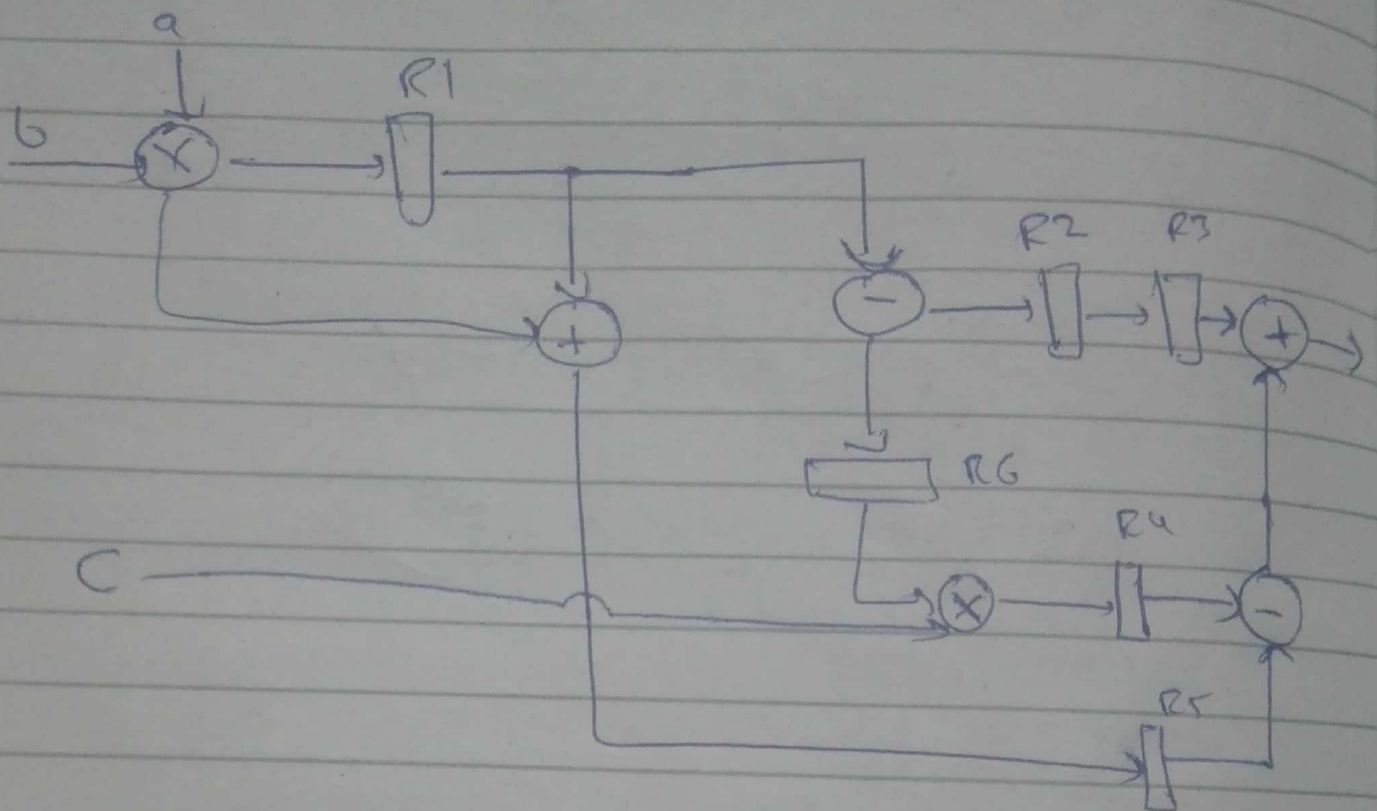




3 TU

~~Ans~~

Continuation of Q#5



G57U
GTU
AW

$$A + B - C$$

$\Gamma = 0.7$

C = 3.2

1

$$A = \begin{pmatrix} 0 & 1 & 1 & 1 & 0 & 0 & 1 & 0 \end{pmatrix}$$

$$B = \begin{pmatrix} 0 & 1 & 1 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

C H O I I O O

1 1 10 10

♭ 1 1 1 0 0 1 0

1 1 0 0 0 1 - 1

100-111

0 1 1 1 1 0 1 - 0 1 1 0 0 1 0

Check Answer

1 1
 0 1 1 0 0 0 1 - 1
 1 1 1 1 0 1 - 0 0
 1 0 1 0 1 1 1 - 0 1 1 0 0 1 0

DC

$h[0]$	$h[1]$	$h[2]$	$h[3]$	$h[4]$	$h[5]$	$h[6]$	$h[7]$
	$h[0]$	$h[1]$	$h[2]$	$h[3]$	$h[4]$	$h[5]$	$h[6]$
		$h[0]$	$h[1]$	$h[2]$	$h[3]$	$h[4]$	$h[5]$
			$h[0]$	$h[1]$	$h[2]$	$h[3]$	$h[4]$
				$h[0]$	$h[1]$	$h[2]$	$h[3]$
					$h[0]$	$h[1]$	$h[2]$
						$h[0]$	$h[1]$
							$h[0]$

X $\left[\begin{array}{l} s[n] \end{array} \right]$