



# Sardar Vallabhbhai National Institute of Technology, Surat

ECED Department

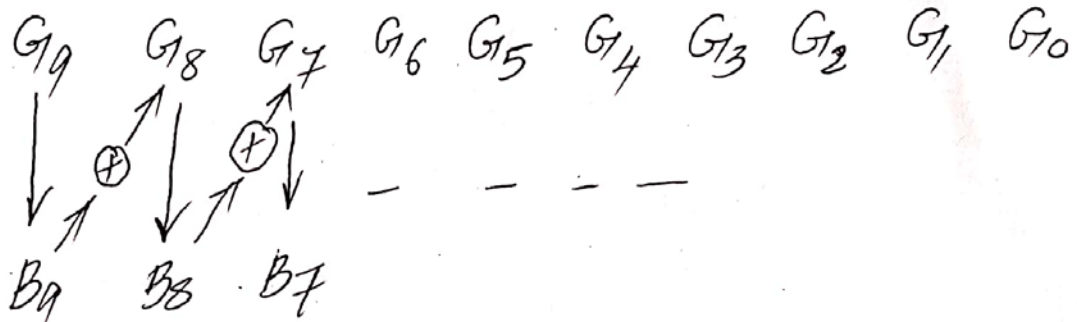
Subject: Digital Electronics & Logic Design (EC-207)  
B.Tech Computer, Sem-III, Div - (A&B)

Date: 10-11-2020

## Tutorial – 8 Hints/Solutions

### Solution to Q1 (5 Marks)

Concept:



$$B_9 = G_9$$

$$B_8 = B_9 \oplus G_8$$

$$B_7 = B_8 \oplus G_7$$

$$B_6 = B_7 \oplus G_6$$

⋮

$$(a) \quad 1100101000$$

$$(b) \quad 1010000010$$

$$(c) \quad 1101011101$$

$$(d) \quad 1111111110$$

### Solution to Q2 (3 Marks)

	$\bar{Y}\bar{Z}$	$\bar{Y}Z$	$YZ$	$Y\bar{Z}$
$\bar{W}\bar{X}$	×	1	1	×
$\bar{W}X$	0	×	1	0
$WX$	0	0	1	0
$W\bar{X}$	0	0	1	0

(a) Combining 1's and X's,  
 $F = \bar{W}Z + YZ$

### Solution to Q3 (5 Marks)

		$C$	
$AB$		0	1
00		0	0
01		0	0
11		0	1
10		1	1

Annotations in the diagram:  
 - A group of 1s in the bottom row (10) is labeled  $\bar{A}\bar{B}$ .  
 - A group of 1s in the right column (1) is labeled  $AC$ .  
 - A group of 0s in the first two rows (00, 01) is labeled  $\bar{B} + C$ .  
 - A group of 0s in the first column (0) is labeled  $A$ .

POS:

$$A(\bar{B} + C)$$

SOP:

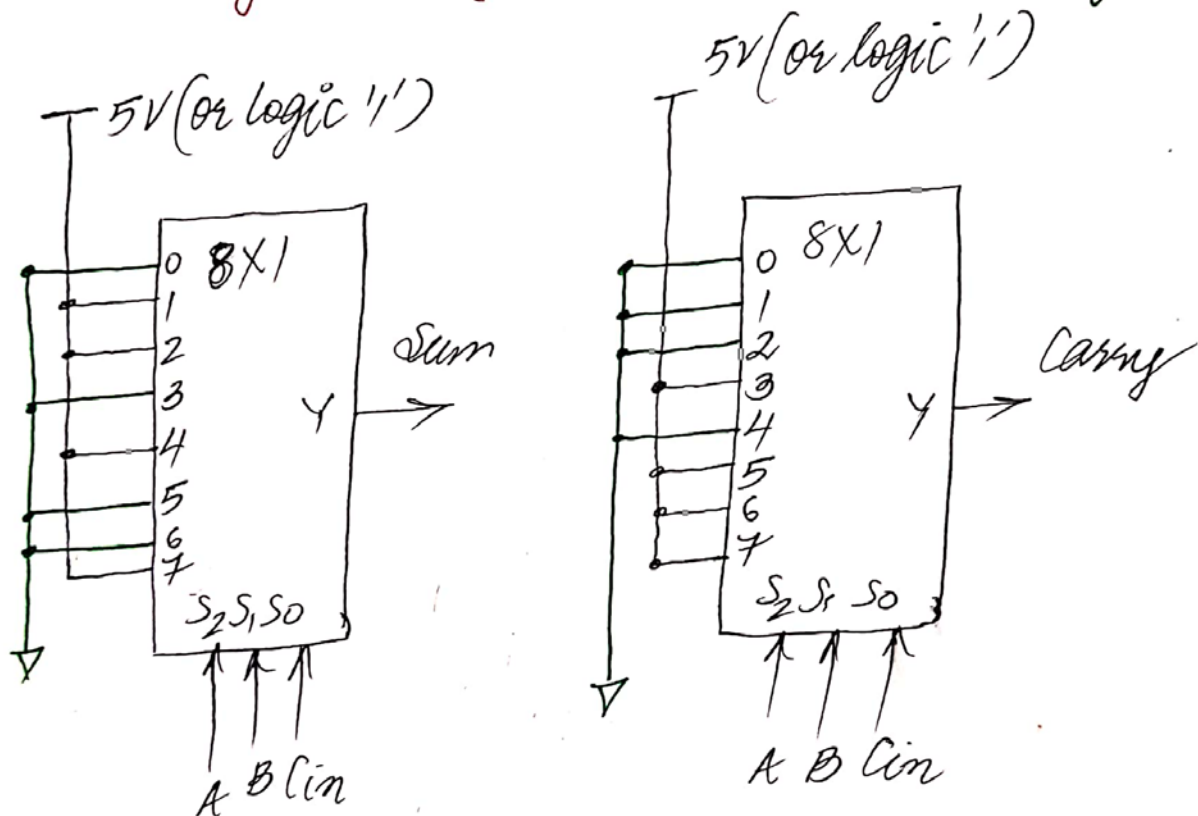
$$AC + \bar{A}\bar{B} = A(\bar{B} + C)$$

## Solution to Q4 (8 Marks)

Full Adder

$Sum = \sum m(1, 2, 4, 7) \rightarrow$  Connect to 5V

$Carry = \sum m(3, 5, 6, 7) \rightarrow$  connect to ground



Same Concept for Full Subtractor

$Difference = \sum m(1, 2, 4, 7) \rightarrow$  Connect to 5V

$Borrow = \sum m(1, 2, 3, 7) \rightarrow$  Connect to ground

## Solution to Q5 (4 Marks)

	$I_0$	$I_1$	$I_2$	$I_3$	$I_4$	$I_5$	$I_6$	$I_7$
$A'$	①	②	3	④	⑤	6	7	
$A$	⑧	⑨	10	11	12	13	14	⑮
	1	1	0	$A'$	$A'$	0	0	$A$

