

Dattodil International university

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Section: pe-J

Course code: CSE 411

Course Title: Computer

Architecture
and organization

ASSIGNMENT-01

$$Y = \bar{A}\bar{B}c\bar{D} + \bar{A}Bc\bar{D} + A\bar{B}c\bar{D} + A\bar{B}cD + A\bar{B}c\bar{D} + A\bar{B}cD + ABc\bar{D} + ABCD.$$

Product Term	Index	A	B	c	D
$\bar{A}\bar{B}c\bar{D}$	2	0	0	1	0
$\bar{A}Bc\bar{D}$	6	0	1	1	0
$A\bar{B}c\bar{D}$	8	1	0	0	0
$A\bar{B}cD$	9	1	0	0	1
$A\bar{B}c\bar{D}$	10	1	0	1	0
$A\bar{B}cD$	11	1	0	1	1
$ABc\bar{D}$	14	1	1	1	0
$ABcD$	15	1	1	1	1

Step : 1

Group No:	Min term	Binary Representation
1	m2 m8	0 0 1 0 1 0 0 0
2	m6 m9 m10	0 1 1 0 1 0 0 1 1 0 1 0
3	m11 m14	1 0 1 1 1 1 1 0
4	m15	1 1 1 1

Step : 2

Group No:	Matched Pair	Binary Representation
1	m2 - m6 m2 - m10 m8 - m9 m8 - m10	0 - 1 0 - 0 1 0 1 0 0 - 1 0 - 0
2	m6 - m14 m9 - m11 m10 - m11 m10 - m14	- 1 1 0 1 0 - 1 1 0 1 - 1 - 1 0
3	m11 - m15 m14 - m15	1 - 1 1 1 1 1 -

Step: 3

Group No:	Matched pair	Binary Representation
1	$m_2 - m_6 - m_{10} - m_{14}$	- - 1 0
	$m_2 - m_{10} - m_6 - m_{14}$	- - 1 0
	$m_8 - m_9 - m_{10} - m_{11}$	1 0 - -
	$m_8 - m_{10} - m_9 - m_{11}$ $m_8 - m_{10} - m_9 - m_{11}$	1 0 - -
2	$m_{10} - m_{11} - m_{14} - m_{15}$	1 - 1 -
	$m_{10} - m_{14} - m_{11} - m_{15}$	1 - 1 -
		Prime Implement $C\bar{D}, A\bar{B}, AC$

Step: 4

Prime Implement	min term	2	6	8	9	10	11	14	15
$C\bar{D}$	2, 6, 10, 14	⊗	⊗			X		X	
$A\bar{B}$	8, 9, 10, 11			⊗	⊗	X	X		
AC	10, 11, 14, 15					X	X	X	⊗

$$Y = C\bar{D} + A\bar{B} + AC$$