CSE-2011 — Paper II

5) (d)(i) Compute $(3205)_{10}$ to the base 8

$\Rightarrow$

$$\begin{array}{r|ll} 8 & 3205 & \\ 8 & 400 & -5 \\ 8 & 50 & -0 \\ & 6 & -2 \end{array}$$

$\therefore (3205)_{10} = (6205)_8$

(d)(ii) Let A be an arbitrary but fixed Boolean algebra with operations $\wedge, \vee$ and $'$ and the zero and the unit element denoted by 0 and 1 respectively. Let x, y, z — be elements of A. If $x, y \in A$ be such that $x \wedge y = 0$ and $x \vee y = 1$ then P.T, $y = x'$.

$\Rightarrow$ Here $x, y \in A$,

$x \wedge y = 0$ and $x \vee y = 1$

$\Rightarrow (x \wedge y)' = 0'$

$\Rightarrow x' \vee y' = 1$ [By De-Morgan property]

$\Rightarrow x' \vee y' = x \vee y$

But in this case $x' \neq$ & $y' \neq y$

so, obviously, $x' = y$ and $y' = x$

7) (b) Find the logic circuit that represents the following Boolean function. Find also an equivalent simpler circuit:

x	y	z	$f(x,y,z)$		minterm
1	1	1	1	m_1	xyz
1	1	0	0	m_2	$xy\bar{z}$
1	0	1	0	m_3	$x\bar{y}z$
1	0	0	0	m_4	$x\bar{y}\bar{z}$
0	1	1	1	m_5	$\bar{x}yz$
0	1	0	0	m_6	$\bar{x}y\bar{z}$
0	0	1	0	m_7	$\bar{x}\bar{y}z$
0	0	0	0	m_8	$\bar{x}\bar{y}\bar{z}$

⇒ To get the Boolean function, lets add minterms Corresponding to output '1'.

$\therefore f(x,y,z) = m_1 + m_5$

$= xyz + \bar{x}yz$ #

$= (x+\bar{x})yz = yz \quad [\because A+\bar{A}=1]$

$\therefore$ Simple circuit is,

7)(c) Draw a flow chart for Lagrange's Interpolation formula

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