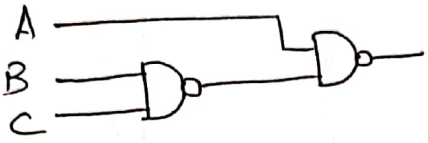
Autumn Mid. Sem Exam - 2019
DE Marking Scheme.

1) a) $\begin{array}{r} 435 \\ -276 \\ \hline \end{array}$ → $\begin{array}{l} 0100\ 0011\ 0101 \\ 0010\ 0111\ 0110 \\ \hline 0001\ 1001\ 1111 \\ -\quad 0110\ 0110 \\ \hline 0001\ 0101\ 1001 \end{array}$ [1]

b) $\overline{\overline{A} + BC}$

$= \overline{\overline{A} \cdot \overline{BC}}$

$= A \cdot \overline{BC}$

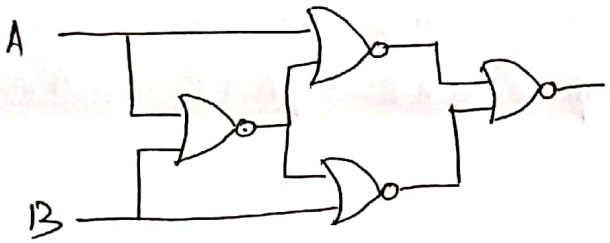


Ans: 2 [1]

c) Advantage - [1]

d) $c_3c_2c_1 = (010)_2$ for even parity or $(101)_2$ for odd

Corrected data = (0001) " or (0101) " [1]

e) 

A⊙B [1]

2)

wx \ yz	$y+z$	$y+\bar{z}$	$\bar{y}+\bar{z}$	$\bar{y}+z$
$w+x$	1	1	1	1
$w+\bar{x}$	0	X	1	X
$\bar{w}+\bar{x}$	0	0	X	0
$\bar{w}+x$	1	0	X	1

[2]

$f = (\bar{x}+z) \cdot (\bar{w}+\bar{z})$ [1]

$= \overline{(\bar{x}+z)} + \overline{(\bar{w}+\bar{z})}$

Diagram - [2]

3) a)

D_1	D_2	D_0	D_3	A	B	V
0	0	0	0	X	X	0
1	0	0	0	0	1	1
X	1	0	0	1	0	1
X	X	1	0	0	0	1
X	X	X	1	1	1	1

[3]

$A = \Sigma m(1,3,4,5,7,9,11,12,13,15) + d(0)$

$B = \Sigma m(1,3,5,7,8,9,11,13,15) + d(0)$

$V = \Sigma m(1-15)$ [1]

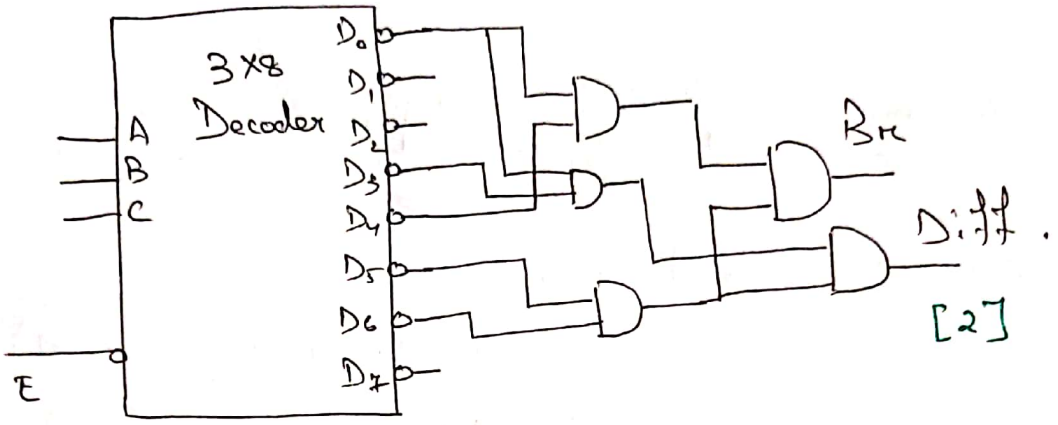
from K-map, $A = D_2\bar{D}_0 + D_3$, $V = D_0 + D_1 + D_2 + D_3$

$B = \bar{D}_2\bar{D}_0 + D_3$ [1]

Diagram of A, B & V - [1]

b) Weighted codes with example - [1]
Non-weighted " " - [1]

4) a) $B_R = \Sigma m(1,2,3,7) = \pi M(0,4,5,6)$ [1]
$Diff = \Sigma m(1,2,4,7) = \pi M(0,3,5,6)$



[2]

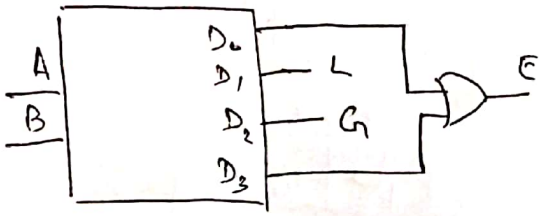
b) $C = \bar{A}B + A\bar{B} = \bar{A} + \bar{B} + A\bar{B} = \bar{A} + \bar{B}$ [1]

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

$= \bar{A} + AB = \bar{A} + B$. [1]

5) a) Diagram - [2]
Explanation - [1]

b) $L = \Sigma m(1)$
$E = \Sigma m(0,3)$
$G = \Sigma m(2)$ [1]



[1]

6) a)

1010 $\xrightarrow[\text{Gray}]{}$ 1111 $\xrightarrow[\text{HC}]{}$ 1111111 $\xrightarrow[\text{PE}]{}$ 111 [2]

$A_1 A_0 B_1 B_0 = 1110 \Rightarrow E = 0, L = 0, G = 1$ [1]

b) Invalid states in Excess - 3 are

0000 1101
0001 1110 [2]
0010 1111