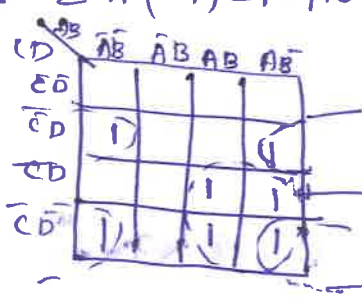
38385

Code NO: 00038385

3 (b) $Y = \Sigma m(1,2,9,10,11,14,15)$ — 6 Mark

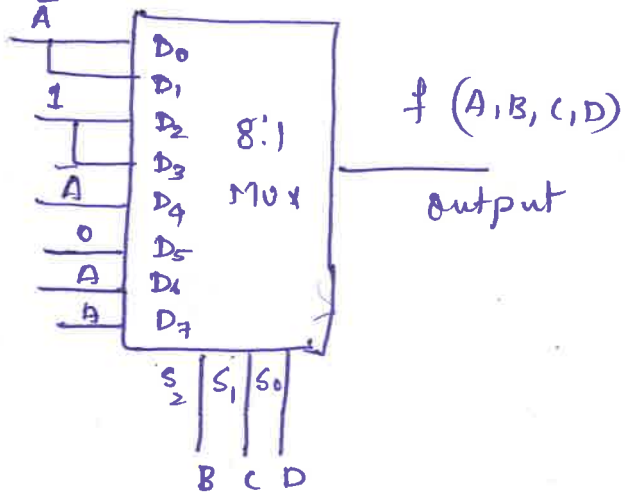


$Y = AC + \bar{B}\bar{C}D + B\bar{C}D$

Implementation using gates — 4 Mark.

4 (b) $F(A,B,C,D) = \Sigma m(0,1,2,3,4,10,11,14,15)$

	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7
$\bar{A}$	0	1	2	3	4	5	6	7
A	8	9	10	11	12	13	14	15
	$\bar{A}$	$\bar{A}$	1	1	$\bar{A}$	0	A	A



5 (a)

Binary input			Gray output		
B_2	B_1	B_0	G_2	G_1	G_0
0	0	0	0	0	0
0	0	1	0	0	1
0	1	0	0	1	1
0	1	1	0	1	0
1	0	0	1	1	0
1	0	1	1	1	1
1	1	0	1	0	1
1	1	1	1	0	0

4 Mark

4 Mks

$\bar{B}_1\bar{B}_0$	$\bar{B}_2$	B_2
$\bar{B}_1\bar{B}_0$	0	1
$\bar{B}_1 B_0$	0	1
$B_1 B_0$	0	1
$B_1\bar{B}_0$	0	1

$G_2 = B_2$

$\bar{B}_1\bar{B}_0$	$\bar{B}_2$	B_2
$\bar{B}_1\bar{B}_0$	0	1
$\bar{B}_1 B_0$	0	1
$B_1 B_0$	1	0
$B_1\bar{B}_0$	1	0

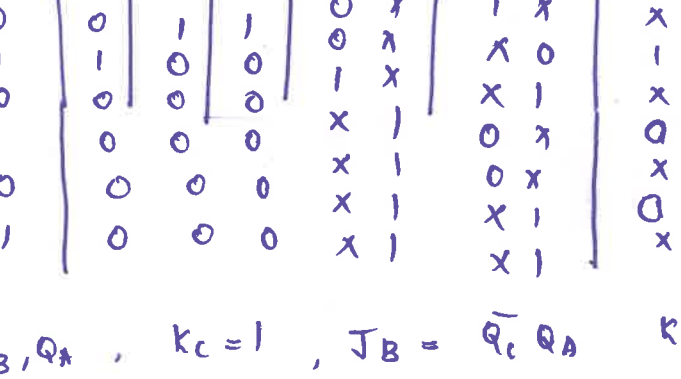
$G_1 = \bar{B}_2 B_1 + B_2\bar{B}_1$

$= B_2 \oplus B_1$

$\bar{B}_1\bar{B}_0$	$\bar{B}_2$	B_2
$\bar{B}_1\bar{B}_0$	0	0
$\bar{B}_1 B_0$	1	1
$B_1 B_0$	0	0
$B_1\bar{B}_0$	1	1

$G_0 = \bar{B}_1 B_0 + B_1\bar{B}_0$

$G_0 = B_1 \oplus B_0$



2 Mks

5 (b)

Q_C	Q_B	Q_A
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0

Q_C	Q_B	Q_A	Q_C^+	Q_B^+	Q_A^+	J_C K_C	J_B K_B	J_A K_A
0	0	0	0	0	1	0 x	0 x	1 x
0	0	1	0	1	0	0 x	1 x	x 1
0	1	0	0	1	1	0 x	x 0	1 x
0	1	1	1	0	0	1 x	x 1	x 1
1	0	0	0	0	0	x 1	0 x	0 x
1	0	1	0	0	0	x 1	0 x	x 1
1	1	0	0	0	0	x 1	x 1	0 x
1	1	1	0	0	0	x 1	x 1	x 1

$J_C = Q_B Q_A$, $K_C = 1$, $J_B = \bar{Q}_C Q_A$ $K_B = Q_C + Q_A$, $J_A = \bar{Q}_C$, $K_A = 1$

6 Mks

Implementation using JK – 3 Marks

Timing diagram – 1 Mark