SIMON FRASER UNIVERSITY
School of Mechatronic Systems Engineering
MSE 352 Digital Logic and Microcontrollers
Quiz II – Fall 2022

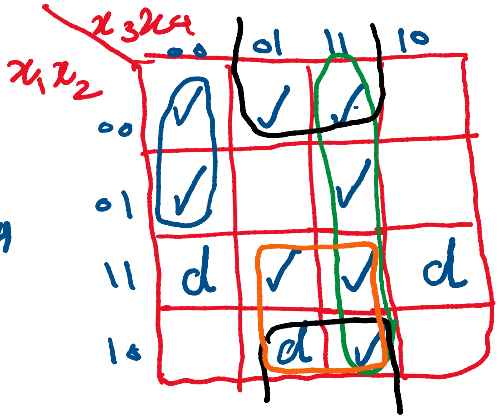
Student Full Name:_____

Student Number :_____ Solutions

1. Use Karnaugh maps to find the minimum-cost SOP for the function:
   $f(x1, x_2, x_3, x4) = \bar{x_1}\bar{x}_3\bar{x}_4 + x_3x_4 + \bar{x}_1\,\bar{x}_2x_4 + x_1x_2\bar{x}_3x_4$
   assuming that there are also don't-cares defined as $D = \sum(9, 12, 14)$. **[6 marks]**

$F(x_1, x_2, x_3, x_4) =$

$x_3x_4 + x_1x_4 + \bar{x}_2x_4 + \bar{x}_1\bar{x}_3\bar{x}_4$



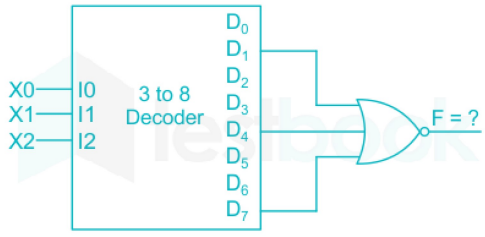
2. A 3X8 decoder is shown in the figure below. Find $f(x_0, x_1, x_2)$ in the form of Sum of minterms. **[4 marks]**

2 ways:

$\Rightarrow F = \sum(0, 2, 3, 5, 6)$

approach 1:

x_2	x_1	x_0	F
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0



approach 2:

$F' = \sum(1, 4, 7) \Rightarrow$

$F = \sum(0, 2, 3, 5, 6)$