Logic Design– Assignment 07

#	Student ID	Student Name	Grade (10)
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Delivery Date	

١. يتم تسليم التمرين محلولا في خلال أسبوع من تاريخ التمرين، و يتم حذف درجتين من التمرين عن كل أسبوع تأخير
٢. يتم التسليم لمعيد المقرر مباشرة
٣. تتم أجابه التمرين في نفس ورق الأسئلة

Q1	Find the minimum sum-of-products expression for each function. Underline the essential prime implicants in your answer and tell which minterm makes each one essential. (a) $f(a, b, c, d) = \Sigma\, m(0, 1, 3, 5, 6, 7, 11, 12, 14)$ (b) $f(a, b, c, d) = \Pi\, M(1, 9, 11, 12, 14)$ (c) $f(a, b, c, d) = \Pi\, M(5, 7, 13, 14, 15) \bullet \Pi\, D(1, 2, 3, 9)$
Sol 1	.....

Q2	Find the minimum sum-of-products expression for each function. (a) $f(a, b, c, d) = \Sigma\, m(0, 2, 3, 4, 7, 8, 14)$ (b) $f(a, b, c, d) = \Sigma\, m(1, 2, 4, 15) + \Sigma\, d(0, 3, 14)$ (c) $f(a, b, c, d) = \Pi\, M(1, 2, 3, 4, 9, 15)$ (d) $f(a, b, c, d) = \Pi\, M(0, 2, 4, 6, 8) \bullet \Pi\, D(1, 12, 9, 15)$
Sol 2	.....

Q3	Find the minimum sum of products for the given expression. Then, make minterm 5 a don't-care term and verify that the minimum sum of products is unchanged. Now, start again with the original expression and find each minterm which could *individually* be made a don't-care without changing the minimum sum of products. $$F(A, B, C, D) = A'C' + B'C + ACD' + BC'D$$
Sol 3	.....

Q4	Find the minimum sum of products for each of these functions. (a) $f_1(A, B, C) = m_1 + m_3 + m_4 + m_6$ (b) $f_2(d, e, f) = \Sigma\, m(1, 4, 5, 7)$ (c) $f_3(r, s, t) = r't' + rs' + rs$ (d) $f_1(a, b, c) = m_3 + m_4 + m_6 + m_7$ (e) $f_2(n, p, q) = \Sigma\, m(2, 3, 5, 7)$ (f) $f_4(x, y, z) = M_3 M_6$
Sol 4	.....

Q5	Find the minimum product of sums for the following. Underline the essential prime implicants in your answer. (a) $\Pi\, M(0, 2, 4, 5, 6, 9, 14) \bullet \Pi\, D(10, 11)$ (b) $\Sigma\, m(1, 3, 8, 9, 15) + \Sigma\, d(6, 7, 12)$
Sol 5	.....

Q 6	Given $F = AB'D' + A'B + A'C + CD$. (a) Use a Karnaugh map to find the maxterm expression for F (express your answer in both decimal and algebric notation). (b) Use a Karnaugh map to find the minimum sum-of-products form for F'. (c) Find the minimum product of sums for F.
Sol 6	.....