

Review Questions for Chapter 3 Solutions

1. From the given truth table, we can write following two K-maps.
K-map for S,

	C _i	0	1
AB			
00		0	1
01		1	0
11		0	1
10		1	0

From the K-map, we have

$$S = \bar{A}\bar{B}C_i + \bar{A}B\bar{C}_i + AB\bar{C}_i + A\bar{B}C_i = (\bar{A}B + A\bar{B})\bar{C}_i + (\bar{A}\bar{B} + AB)C_i = A \oplus B \oplus C_i$$

K-map for C_o

	C _i	0	1
AB			
00		0	0
01		0	1
11		1	1
10		0	1

From the K-map, we have

$$C_i = AB + BC_i + AC_i = AB + (\bar{A}B + A\bar{B})C_i = AB + (A \oplus B)C_i$$

- 2 A 16-bit CSA adder implementation. The critical path is shaded in grey.

