

Review Questions for Chapter 3

1. The truth table of a full adder is given below. Show that logic expressions of S and C_o are:

$$S = A \oplus B \oplus C_i$$

$$C_o = AB + C_i(A \oplus B) = AB + (A + B)C_i$$

| A | B | C_i | S | C_o | Carry status |
|-----|-----|-------|-----|-------|--------------|
| 0 | 0 | 0 | 0 | 0 | delete |
| 0 | 0 | 1 | 1 | 0 | delete |
| 0 | 1 | 0 | 1 | 0 | propagate |
| 0 | 1 | 1 | 0 | 1 | propagate |
| 1 | 0 | 0 | 1 | 0 | propagate |
| 1 | 0 | 1 | 0 | 1 | propagate |
| 1 | 1 | 0 | 0 | 1 | generate |
| 1 | 1 | 1 | 1 | 1 | generate |

2. A 4-bit carry select adder (CSA) is shown in Figure Q2.

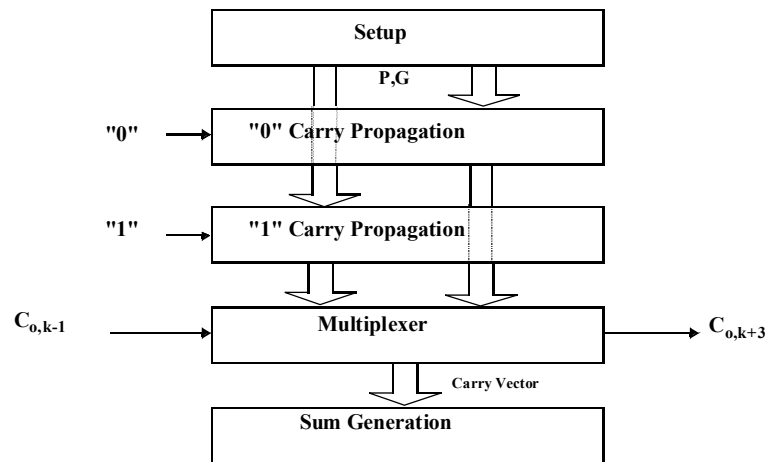


Figure Q2

(i) Sketch the implementation of a 16-bit carry select adder by using the 4-bit CSA as basic building block. (ii) Highlight the critical path of the 16-bit CSA in your implementation.