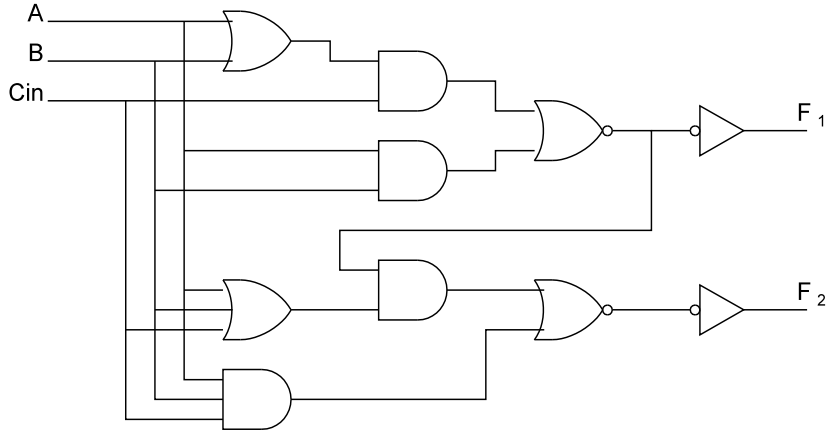


problems 1 & 2 required
 problem 3 extra credit

ENGR-354
 HW#11

1) Show that the logic circuit below is that of a full adder.



- 2) Implement a circuit that will produce the product of a positive 2-bit binary number and constant 3 (i.e. the 2-bit binary number is multiplied by three). Use one half adder, one NOR gate, and one inverter and nothing else. (hint: construct a truth table with the 2-bit number as the input and showing the sum, carry out, and resulting 4-bit product as outputs)

- 3) Create a full adder using one 3-to-8 decoder and two NAND gates (and nothing else). The inputs A and B will be asserted high but carry-in will come asserted low (meaning that a carry in is represented by a low voltage which we usually think of as a logic 0). Also, standard 3-to-8 decoders, such as the 74HC138 in your kit, have outputs that are asserted low meaning that all the outputs are at a logic 1 voltage level (high voltage) except the one selected by the present inputs. (A truth table will be useful on this problem also)

