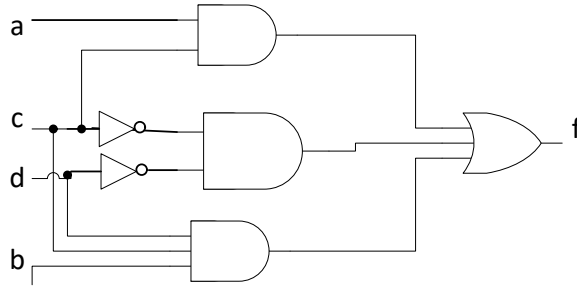Faculty of Engineering and Technology
Electrical and Computer Engineering Departmen
Advanced Digital Design ENCS533
Take Home Exam

Q1) 10 points

For the following circuit

    i) Determine the values of inputs at which hazard may occur.

    ii) Draw the hazard-free circuit (AND-OR implementation).

Q2) 30 points

Use the asynchronous design procedure to design a **negative edge M Flip-Flop**. The M flip-flop has two inputs M and the clock C , and one output Q. It works as follows: at the negative edge of C (C = clock) if M =1 then the output Q will set (i.e. Q(t+1) = 1) , while if M = 0 at the negative edge of C then the output will be complemented (i.e. $Q(t+1) = Q'(t)$) . Go through the steps of asynchronous design procedure to design the circuit. The implementation will be using SR latches by finding the equations of their inputs (S1,R1, S2,…etc.) and the equation of output Q (**NO NEED TO DRAW THE FINAL CIRCUIT DIAGRAM**).

Hint: There will be 8 stable states in the primitive flow table.

ملاحظة ، أول خطوة في الحل هي بناء

Primitive Flow Table

هذه الخطوة إن تم عملها بشكل صحيح ، ستحصل على نصف علامة السؤال ، وما تبقى من خطوات طويلة عليها نصف علامة السؤال ، لذلك أنصحكم بالتفكير جيدا في بداية حل السؤال لبناء هذا الجدول بشكل صحيح ، حيث أن بقية الحل يعتمد عليه.