

Exam 1
EET 242
Sequential Circuits and Applications

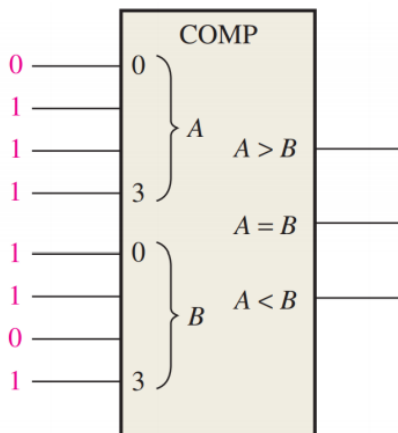
Name:

1. (15 Points) Determine the outputs of a full adder for each of the following inputs:

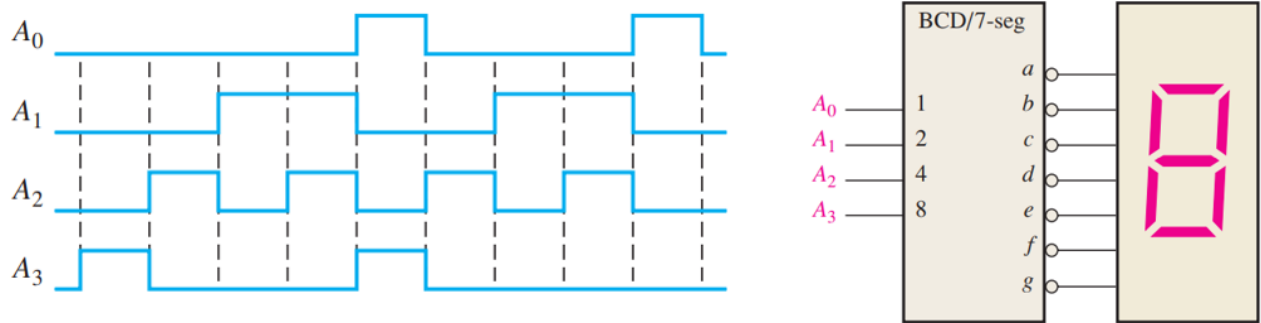
(a) $A = 1$, $B = 0$, $C_{in} = 1$

(b) $A = 0$, $B = 0$, $C_{in} = 1$

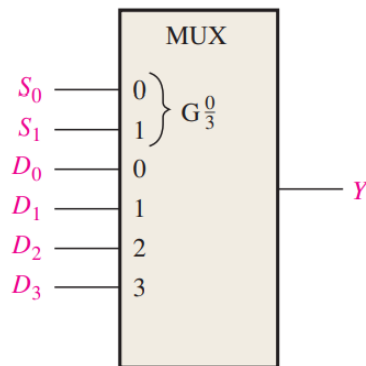
2. (15 Points) Determine the $A = B$, $A > B$, and $A < B$ outputs for the input numbers shown on the comparator in the following Figure. (10 Points)



3. (20 Points) A 7-segment decoder/driver drives the display in the following Figure. If the waveforms are applied as indicated, determine the sequence of digits that appears on the display.



4. (20 Points) For the multiplexer shown in the following figure, determine the output for the following input states: $D_0 = 1, D_1 = 0, D_2 = 1, D_3 = 1, S_0 = 1, S_1 = 1$.



5. (20 Points) Use a Karnaugh map to minimize the following SOP expression:

$$\bar{A}\bar{B}C + A\bar{B}CD + AB\bar{C}D$$

6. (15 Points) Using Boolean algebra, simplify following expression. Clearly state the laws, rules, and identities used.

$$\bar{A}\bar{B}C + \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{C}\bar{D} + ABD$$