

ECE374 SP23 HW1

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Problem 4

4: (a). $1^*01^*01^* + 1^*01^* + 1^*$

Explanation: There may be at most 2 zero's.

(b). $(0+10)^*(\epsilon+1)(1+01)^*(\epsilon+0)$.

Explanation: The former half excludes 11 while the latter half excludes 00.

(c). $0^*+1^*+0^*1^*+1^*0^*+1^*0^*1^*$. Equivalently, $1^*0^*1^*$.

Explanation: Think in sections. A section of 1's followed by 0's and 1's. Each section may be empty.

Expanding the head $(0^*1^*0^*1^*)$ or tail $(1^*0^*1^*0^*)$ will both introduce the 010 substring!

(d). $1^*0^*1^*0^*1^*0^*1^*$.

Explanation: A generalized case of (c).

(e). 0^*1^* .

Explanation: Also a generalized case of (c). ~~the~~
All zero's should appear before one's.