Problem 1 [8 Points]
Give the regular expression for the following languages, where the alphabet \( \Sigma = \{0,1\} \)

a- [1 Points] All possible strings over the alphabet \( \Sigma \) \( (0 + 1)^* \)

b- [1 Points] All strings that begin with a 0 \( 0 (0 + 1)^* \)

c- [1 Points] All strings that end with a 1 \( (0 + 1)^* 1 \)

d- [2 Points] All strings that contain the substring 0110 \( (0 + 1)^* 0110 (0 + 1)^* \)

e- [3 Points] All strings that begin and end with different letters and contain the 1010
\( 0(0 + 1)^*1010(0 + 1)^*1 + (0 + 1)^*1010(0 + 1)^*0 + 1010^* \) (you might have written something different yet correct).

Problem 2 [7 Points]
Write the Regular Expression that gives the same language as the NFA given below.

The step by step state elimination is given below. You may choose the order of state according to your own preference. Writing the regular expression directly would also earn you full credit.
(0+1)*1((0+1) + 11*(0+1)) (0+1)*