

# PA3 - Non-Deterministic Finite Automata (L.EIC-TC-2021-22)



Pontos: 11/11

1. The difference between a Deterministic Finite Automata (DFA) and a Non-Deterministic Finite Automata (NFA) is:

(1/1 Ponto)

- ☒ an NFA can have several transitions from the same state for the same input symbol, while a DFA can have only one. ✓
- ☐ an NFA can have infinite states while a DFA can have only a finite number of states.

2. While processing an input, an NFA can be in more than one state at a time:

(1/1 Ponto)

- ☒ True ✓
- ☐ False

3. There can exist one or more languages accepted by NFAs that cannot be accepted by DFAs.

(1/1 Ponto)

☐ True

☐ False



4. A dead state can sometimes also be an accepting state.

(1/1 Ponto)

☐ True

☐ False



5. There exists an algorithm that, for every NFA, returns a DFA which accepts the same language.

(1/1 Ponto)

☒ True

☐ False



6. NFAs cannot have multiple accept states.

(1/1 Ponto)

☐ True

☐ False



7. What is the lowest number of states possible for an NFA, which accepts a language composed solely of 0's, repeated  $n$  times, such that  $n$  is a multiple of 3 and  $n$  can be zero?

(2/2 Pontos)

☐ 2 states

☐ 3 states



☐ 4 states

8. Considering the NFA referred in the previous question, its complement accepts the following strings: "0", "00", and "0000".

(1/1 Ponto)

☒ True



☐ False

9. Considering an NFA that accepts a language composed of alternating 0's and 1's, but always ending in 0, and any 1 can be replaced with a 0 (accepts: "0", "010", "000", "10", "00", "1010", "1000", "0010"), how many states has the DFA obtained by subset construction?

(2/2 Pontos)

☐ 4 states

☐ 5 states



☐ 6 states

☐ 7 states