Theory of Automata
Spring-2020   Final-Semester
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- Attempt All Tasks.

Q#1. Parse the given RE into its Individual / Atomic Symbols and then design an NFA.   (10)

$$(a / b)* (ab / ba)$$

Q#2. Design RE for each of the following.   (10)

      i.   RE for all the optional words over {a   b}.
      ii.   RE for all the optional words over {a   b} with an Even Number of "a".
      iii.   RE for all the optional words over {a   b} with an Odd Number of "a".
      iv.   RE for all the optional words over {a   b} where Last symbol must be "b".
      v.   RE for all the optional words over {a   b} where First symbol must be "b".

Q#3. (a). Prove that
$$(a / b)* != a*b*$$ (07)

    (b). Derive language descriptions (statements) for the following RE.   (08)

      i.   (a / b) (a / b) b (a / b)*

      ii.   (a / b)* b (a / b) (a / b)

      iii.   (a / b)* (aa /bb)

      iv.   (aa / bb) (a / b)*

Q#4. Design NFA for the following without Parsing.
      i.   (+ / -) d^+ (07)
      ii.   (a / b)* (aaa /bbb) (a / b)*   (08)