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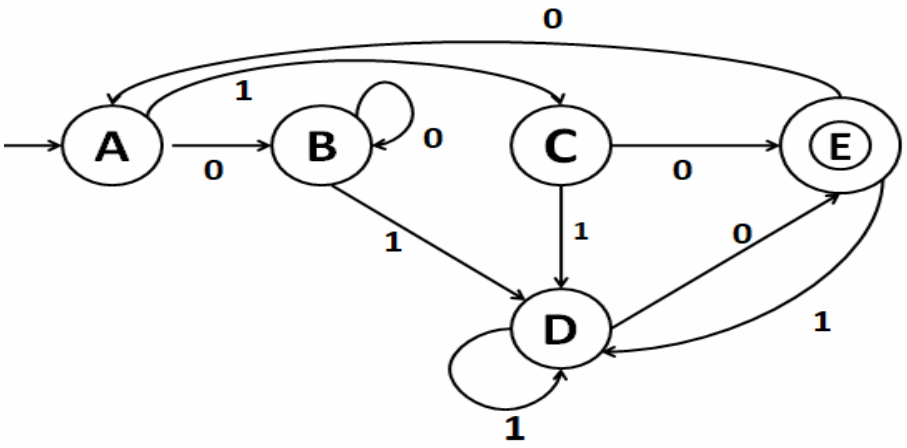
Assignment #1

Course title: Theory of Computation

1. Describe the method of subset construction to convert a given NFA into equivalent DFA with Suitable example.(10)
2. Show that for any regular expression, there is also a ε-NFA that accepts the same language represented by r. Convert the regular expression (a+b)(aa+ba)*+ab(a+b)*bba into ε-NFA.[6+4]
3. State and prove pumping lemma theorem for the regular language. Show by example that how it can be used to prove a language is not regular.[5+5]
4. How a ε-NFA can be converted into NFA and DFA? Explain with suitable example.[5+5]
5. Define finite automata with ε-Moves. Is ε-NFA has more computational power that DFA?[5]
6. Give the DFA accepting the strings over {a, b} such that each string does not starts with ab.[5]
7. Explain the Table filling method of DFA minimization. Find the minimum state DFA equivalent to the following DFA using Table filling method.[3+7]



8. Show that a language L is accepted by some DFA if and only if L is accepted by some NFA.[5]
9. What is DFA? How it differ with a NFA? Explain.[5]
10. Give the DFA for languages of strings over {0,1} in which each strings end with 11.[5]
11. Give the DFA for the language of strings over {a, b} where no two consecutive a's occurred.[5]
12. Show that language of palindrome over [a, b} is not a regular language.[5]
13. Construct the FA recognizing the language corresponding to the following RE.[5]
    i. (11+10)*01
    ii. (111+100)*10