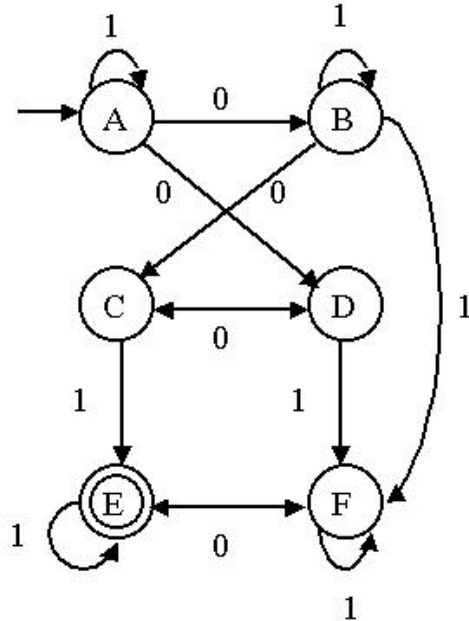


Answer all questions in the exam book. You may keep the exam questions after you are done.

Consider the following nondeterministic finite state automata:



1. [10] Give the regular grammar that accepts the same set.
2. [10] Give the deterministic finite state automaton that accepts the same set.
3. [10] Give the minimal state deterministic finite state automaton that accepts the same set.
4. [48] Consider the following grammar:
  - $S \rightarrow X \mid aYS$
  - $X \rightarrow bX \mid b$
  - $Y \rightarrow cY \mid c$

For each grammar class below determine if the grammar belongs to that class. If it belongs to that class, give the parsing table, if not explain why not [1 point for correct yes/no answer, 7 points for correct table or proof of why it is not of that class.]

- (a) LL(0)
  - (b) LL(1)
  - (c) LR(0)
  - (d) LR(1)
  - (e) SLR(1)
  - (f) LALR(1)
5. [7] Show that the set of binary integers containing the string 010 is regular.
  6. [7] Show that the set of binary integers not containing the string 010 is regular.
  7. [7] Show that a grammar that is ambiguous cannot be LL(1).
  8. [1] What is your TA's name?