

SEARCH VIT QUESTION PAPERS
ON TELEGRAM TO JOIN



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

School of Computer Science & Engineering

Continuous Assessment Test –I

A2+TA2+TAA2-Slot CAT-I (Aug-2018)

CSE2002-Theory of Computation and Compiler Design

Time: 1:30 Hrs

Max.M

Answers ALL the questions

1. Prove or disprove the following:

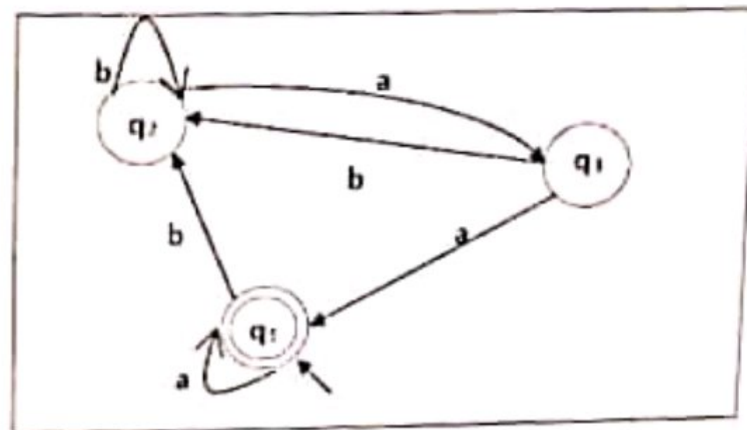
a) Let $L = \{ w \in \{0, 1\}^* \mid w \text{ contains at least three 1's} \}$ and let
 $L' = \{0, 1\}^* 1 \{0, 1\}^* 1 \{0, 1\}^* 1 \{0, 1\}^*$, $L = L'$

b) Let $L = \{a^n b^n \mid n \geq 0\}$. Then the complement of L is L^c and
 $L^c = \{a^n b^m \mid m, n \geq 1, m \neq n\}$

0
1

b) Using Arden's Theorem, construct a regular expression to the automata given below

[5]



3. a) State pumping lemma for regular languages and show that $L = \{a^n / n \geq 1\}$ is not regular. [4]

b) Construct a DFA over $\Sigma = \{a, b\}$ for accepting strings which satisfy the following conditions:

If the string begins with **a** it is of even length (≥ 2). If the string begins with **b** it is of odd

length (≥ 3).

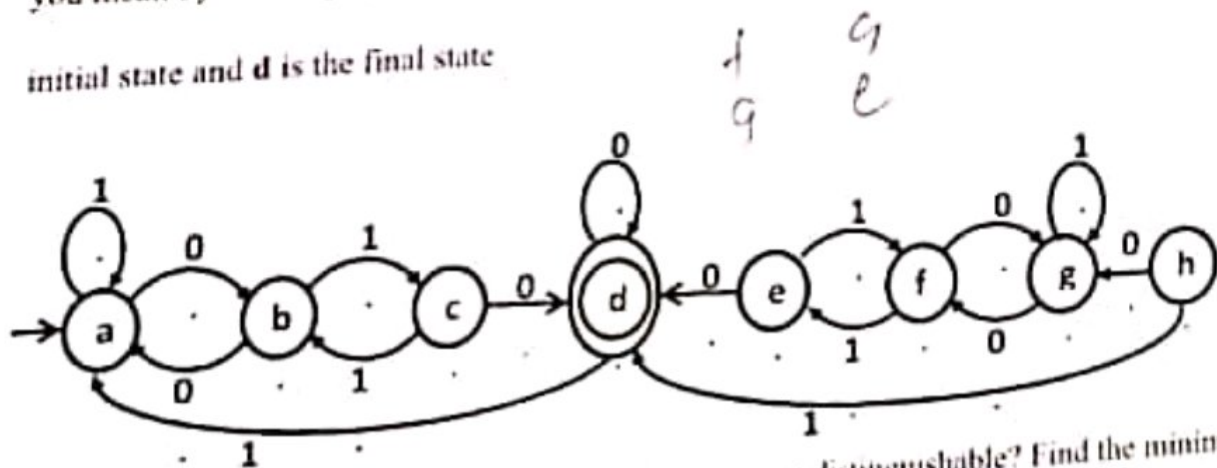
[4]

4. a) Show the translation for an assignment statement: `position := initial + rate * 60`. Clearly indicate the output of each phase of the compiler. [4]

b) When do you say two states are equivalent in DFA? When are they distinguishable? What do

you mean by a distinguishable sequence? Consider the DFA in the following figure. **a** is the initial state and **d** is the final state

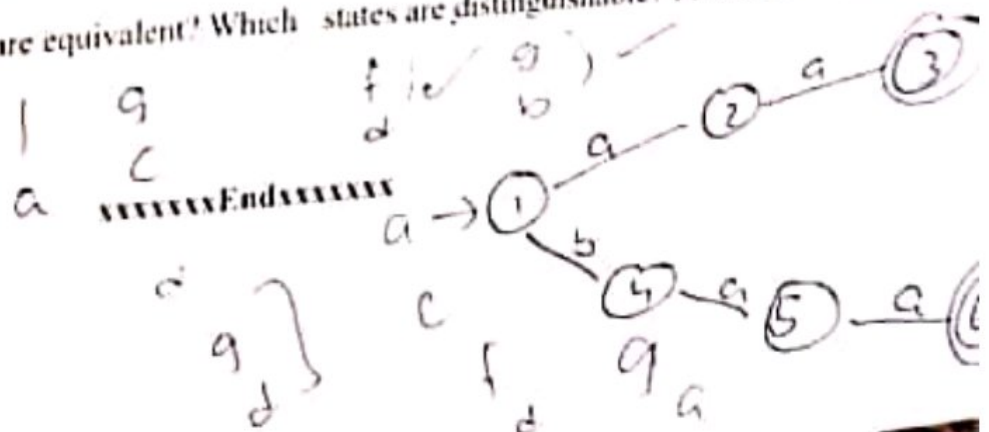
[8]



Which states are equivalent? Which states are distinguishable? Find the minimum state

automaton.

$(a, 0) = a$
 $(e, 0) = d$



Minimize the given DFA

