VIT UNIVERSITY
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VELLORE ■ CHENNAI
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SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

Continuous Assessment Test - I, August 2017

B.Tech./ (CSE) Fall Semester, 2017-18

Course Code :CSE2002 Duration: 90 min. **Max. Marks: 50**

Course Name :Theory of Computation and Compiler Design **Slot : G2+TG2**

Answer ALL the questions

(5 x 10 = 50 Marks)

1.a) Give the regular expressions for the following (3 marks)

L1:Set of strings of a and b that has even occurrences of a and no restriction on b. eg. babba

b) Draw a DFA over {0,1} that accepts strings containining atleast two b's and does not contain two successive a's. (4 marks)

c) Construct NFA (with or without ϵ-tranisiton) for the regular expression $(01^* + 10^*)11^*$. (3M)

2. (i) Elucidate the various phases of compiler with the diagram. (ii) trace it out with the program statement a = b + c * 20+d*10 that how each phases of the compiler process the input.

3.Construct a DFA (no minimization required) for the following NFA (figure 1) with ε-transition where s1 is the start state.

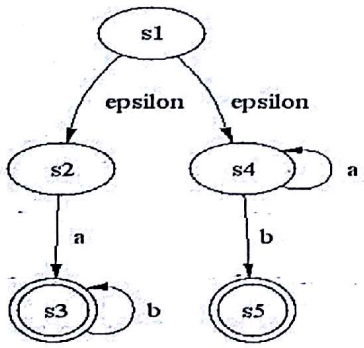

Figure 1 (for Question 3)

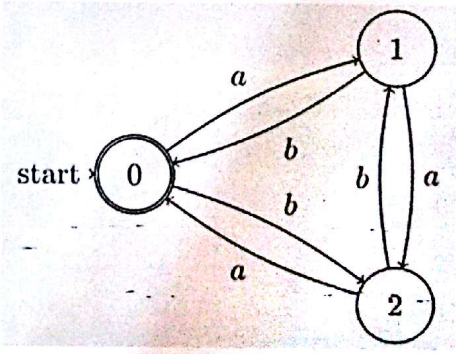

Figure 2 (for Question 5)

4. a) Prove or disprove that the language is regular L3 = $\{a^k \mid k$ is a perfect square. k =1,4,9,...$\}$.

b) Prove or disprove that the language is regular L4= $\{ a^{2n}b^{3m}a^k \mid n,m,k \geq 1\}$.

5. Find the regular expression for the language accepted by the above DFA (see above Figure 2).

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