

## 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

 $(5 \times 10 = 50 \text{ Marks})$ 

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 containing at least two b's and does not contain two successive a's.

  (4 marks)
  - c) Construct NFA (with or without  $\epsilon$ -transition) 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  $\varepsilon$ -transition where s1 is the start state.

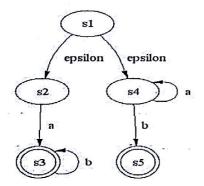


Figure 1 (for Question 3)

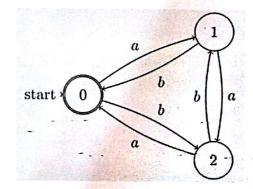


Figure 2 (for Question 5)

- 4. a) Prove or disprove that the language is regular L3 =  $\{a^k \mid k \text{ is a perfect square. } k = 1,4,9,...\}$ . b) Prove or disprove that the language is regular L4=  $\{a^{2n}b^{3m}a^k \mid n,m,k \ge 1\}$ .
- 5. Find the regular expression for the language accepted by the above DFA (see above Figure 2).