

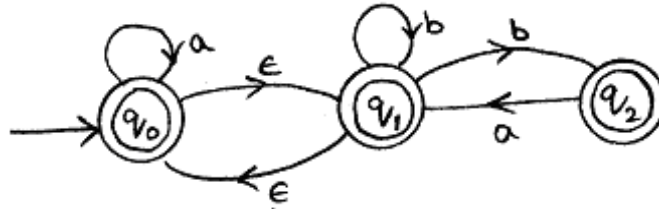
III B.Tech I Semester Supplementary Examinations, April/May 2005
THEORY OF COMPUTATION
 (Common to Computer Science & Engineering, Information Technology and
 Computer Science & Systems Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. (a) Let $R = (1,2), (2,2), (2,3)$ be a relation on the set 1,2,3, Find R^* .
 (b) Develop a Deterministic Finite Automation accepting the language given over the alphabet 0,1. $L =$ the set of all strings such that every block of five consecutive contain at least two o's
 (c) Give mathematical definition of NFA and state main differences between NFA and DFA.
2. For the NFA-E given check whether the string aannanan is accepted or not, If accepted write the transition path. Find equivalent NFA without epsilon transitions, explain the procedure used and check the string given on your new NFA.



3. (a) Construct a FA accepting all strings over $\{a, b\}$ ending in aba or aaba.
 (b) Show that $L = \{\omega\omega/\omega\{a, b\}^*\}$ is not regular. State and explain the theorem used.
4. (a) Obtain the regular grammar to accept the strings containing even number of zeroes.
 (b) Give the CFG to generating the following sets. The set of palindromes over alphabet $\{a, b\}$
5. (a) Construct PDA to accept the CFG and verify by a suitable example.

$$S \rightarrow aABC$$

$$A \rightarrow aB/C$$

$$B \rightarrow bA/b$$

$$C \rightarrow a$$
 (b) Convert the following grammar to GNF

$$S \rightarrow AA/a$$

$$A \rightarrow SS/b$$

6.
 - (a) Briefly explain the properties of recursive enumerable languages.
 - (b) Design Turing Machine to recognize the palindromes of digits $\{0, 1\}$. Give its state transition Diagram also.
7.
 - (a) 'Every context free language is not a context sensitive.' Why? Discuss with the help of productions.
 - (b) What do you mean by prefix property of DCFL.
 - (c) Discuss the concept of viable prefix with a suitable example.
8. Write short notes on
 - (a) Undecidability
 - (b) PCP
 - (c) Turing reducability.
