

JK LAKSHMIPAT UNIVERSITY

B. TECH 3RD SEMESTER, END TERM I - EXAM, DECEMBER 2021

SUBJECT: THEORETICAL FOUNDATION OF COMPUTER SCIENCE

MARKS: 25

CODE: CS1103

TIME: 2 HOURS

Answer all questions. Mobile phones are not allowed during exam.

1. Given a set $S_n = \{a_1, a_2, a_3, \dots, a_n\}$ write the power set, $Pow(S_n)$ of S_n .
If R_n be the number of elements in $Pow(S_n)$, then derive a recursive formula to compute R_n . Solve the recursion to show that $R_n = 2^n$. 6
2. Prove that every collection of 6 people includes a club of 3 people, or a group of 3 strangers. 4
3. Define DFA and NDFA mathematically. 4
4. Construct a DFA accepting all string over $\{a, b\}$ not ending in ab . 5
5. Given two regular languages L_1 and L_2 design a machine M which will accept $(L_1 \cup L_2)$ 6