(Please write your Exam Roll No.)

Exam Roll No. .....

END TERM EXAMINATION

FOURTH SEMESTER [B.TECH] JUNE 2024

Paper Code: CIC-206 **Subject: Theory of Computation**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.No.1 which is compulsory. Assume missing data, if any.

Q1 Answer the following questions: **(2.5x10=25)**

a) Write any five Identity Rules for Regular Expressions?

b) What is the difference between Deterministic Finite Automata (DFA) and Non-Deterministic Finite Automata (NDFA)?

c) What is the disadvantages of unambiguous parse tree. Give an example.

d) Define the term context free grammar with an example?

e) Define instantaneous description of a PDA

f) Construct the CFG for generating the language $L=\{a^n b^n / n>=1\}$.

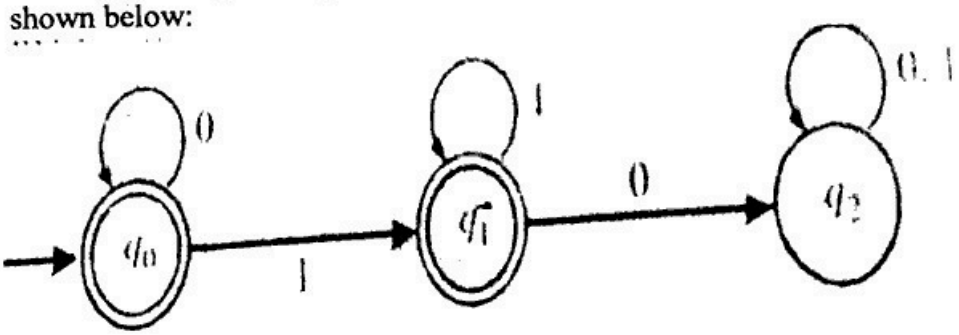
g) For the grammar S->A1B,A->0A | ε, B-> 0B | 1B| ε, give leftmost and rightmost derivations for the string 00101.

h) Prove graph coloring problem is NP complete.

i) Describe the Set of all Strings of 0's and 1's ending in 00 by Regular Expression.

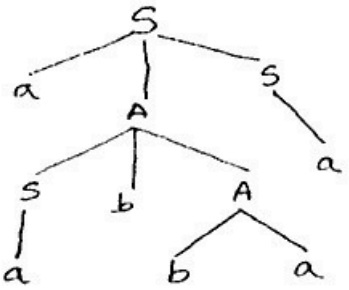
j) Construct a Regular Grammar G generating the regular expression 0*(0+1)?

Q2 a) Construct a Regular Expression for the FA (Using Method of Eliminate States) the shown below: **(6)**



b) Explain Pumping lemma for Context Free Languages. **(6.5)**

Q3 a) Find the left most and right most derivation corresponding to the tree. **(6)**



b) Construct a equivalent grammar G in CNF for the grammar G1 where G1 =({S,A,B},{a,b},{S->bA/aB,A->bAA/aS/a, B->aBB/bS/b},S) **(6.5)**

P.T.O.

MISSING PAGE NO - 2