Roll No.....

Total No. of Questions : 09] [Total No. of Pages : 02

Paper ID [CS404]

(Please fill this Paper ID in OMR Sheet)

MAY-08

B. Tech. (Sem. - 7th/8th)

FORMAL LANGUAGE & AUTOMATA THEORY(CS - 404)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 × 2 = 20)*

a) What do you mean by Kleen's Star?

b) Explain Left derivation.

c) What do you mean by Context Sensitive Language?

d) Give the formal definition of Regular Expression.

e) Construct a nondeterministic automata accepting the set of all strings over {a,b} ending in ab.

f) What do you mean by Canonical Derivation.

g) Build a FA that accepts only the word ^. Also write the corresponding regular expression.

h) Explain rewriting systems.

i) Define Context Free Grammar.

j) Define Pushdown Automata.

Section - B

(4 × 5 = 20)

Q2) Construct Finite Automata equivalent to the regular Expression
(a + b)*(ab + ba)(a + b)*

Q3) Differentiate between 2DFA and Turing Machine.

Q4) What are LR (k) grammars. Explain with examples and also state some properties.

Q5) Build a PDA that accepts the language odd palindrome.

Q6) Explain the Closure properties of Language Classes.

Section - C

(2 × 10 = 20)

Q7) Write a note on Formal Languages and grammars.

Q8) Construct DFA which accepts strings having odd number of a's and even number of b's.

Q9) Design a Turing machine M to recognize the language $\{a^n b^n \mid n >= 1\}$

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