

Roll No.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech (CSE) (Sem.-7)

FORMAL LANGUAGE AUTOMATA THEORY

Subject Code : CS-404

Paper ID : [A0481]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**Answer Briefly :**

- Q1 Give example CNF and GNF productions.
- Q2 Define the term acceptability of a string.
- Q3 Define pumping lemma for regular sets.
- Q4 Define Kuroda normal form.
- Q5 Differentiate between context sensitive and context free grammar.
- Q6 Define yield and ambiguity in CFG.
- Q7 Differentiate between deterministic and non-deterministic PDA.
- Q8 Give rules for converting CFG to PDA.
- Q9 Give instantaneous description of turing machine.
- Q10 What do you mean by halting problem of TM?

SECTION-B

Q11 Write a note on Dyck Language.

Q12 Explain in detail the Chomsky classification of languages.

Q13 Define regular sets and write its closure properties.

Q14 Prove that $P + PQ^*Q = a^*bQ^*$ where $P = b + aa^*b$ and Q is any regular expression. Describe any two representation of TM.

Q15 Find a reduced grammar equivalent to the given grammar.

$$S \rightarrow AC \mid B, A \rightarrow a, C \rightarrow c \mid BC, E \rightarrow aA \mid e$$

SECTION-C

Q16 Find a grammar in GNF equivalent to the grammar.

$$E \rightarrow E + T \mid T \qquad T \rightarrow T * F \mid F \qquad F \rightarrow (E) \mid a$$

Q17 Design Turing Machine of $\{0^n1^n\}$.

Q18 Describe PDA with its representations. Also write rules of converting PDA to CFG.