

T.E- Sem V - OLD - Computer - TCS

(OLD COURSE)**QP Code : 3792**

Duration : 3 hours

Total marks : 100

Note.(1) Question No. 1 is compulsory

- (2) Attempt any four questions from remaining six questions
- (3) Draw suitable diagrams wherever necessary
- (4) Assume suitable data, if necessary.

Q1. (a) Explain Chomsky Hierarchy (10)

(b) Let G be the grammar . Find the leftmost derivation, rightmost derivation and parse tree for the string 00110101 (10)

G: $S \rightarrow 0B \mid 1A$ $A \rightarrow 0 \mid 0S \mid 1AA$ $B \rightarrow 1 \mid 1S \mid 0BB$ Q2. (a) For the alphabet $\Sigma = \{0,1\}$, design a DFA to accept (10)

- (i) a set of all strings ending with 100 or 101.
- (ii) a set of all strings that contain at least three 1's.

(b) What is a regular expression? Give formal definition of a regular expression . Design a (10)

DFA corresponding to the regular expression $(a+b)^* aba(a+b)^*$

Q3. (a) Design a Moore and Mealy machine to convert each occurrence of a substring 100 by 101. (10)

(b) Convert the following NFA to a DFA (10)



