

08/06/15

QP Code : 3552

(3 Hours)

[Total Marks : 80]

- N.B. (1) Question No. 1 is compulsory
 (2) Attempt any three out of remaining five questions
 (3) Assumptions made should be clearly stated
 (4) Figures to the right indicate full marks
 (5) Assume suitable data whenever required but justify that.

[Total Marks : 80

- Q.1 (a) Differentiate between NFA and DFA [5M]
 (b) State and Explain closure properties of Context Free Language [5M]
 (c) Explain with an example the Chomsky hierarchy [5M]
 (d) Compare recursive and recursively enumerable languages. [5M]
- Q.2 (a) Construct PDA accepting the language $L = \{a^n b^n \mid n > 0\}$ [10M]
 (b) Design minimized DFA for accepting strings ending with 100 over alphabet (0,1). [10M]
- Q.3 (a) Convert $(0+\epsilon)(10)^*(\epsilon+1)$ into NFA with ϵ -moves and obtain DFA [10M]
 (b) Construct Turing machine that accepts the string over $\Sigma = \{0,1\}$ and converts every occurrence of 111 to 101. [10M]
- Q.4 (a) Convert following Grammar to CNF and GNF [10M]
 $S \rightarrow ASB/a/bb$
 $A \rightarrow aSA/a$
 $B \rightarrow SbS/bb$
 (b) Design PDA to accept language $L = \{a^{n-1} b^{2n+1} \mid n \geq 1\}$ [10M]
- Q.5 (a) Design Moore Machine to generate output A if string is ending with abb, B if string ending with aba and C otherwise over alphabet (a,b). And Convert it to Mealy machine. [10M]
 (b) Construct TM to check wellformed ness of parenthesis [10M]
- Q.6 Write short note on [20M]
 (a) Rice theorem
 (b) Variant of TM
 (c) Applications of Regular Expression
 (d) Difference between PDA and NPDA