Exam. Code: 0924
Sub. Code: 33561

B.E. (Information Technology)
Sixth Semester
PCIT601: Theory of Computation

Time allowed: 3 Hours Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) Write all possible strings of length two over $\Sigma = \{a, b\}$.

b) Describe the language accepted by Deterministic Finite Automata.

c) State Arden's theorem.

d) How Turing machine differs from PDA?

e) Differentiate between recursive and non- recursive enumerable languages. (5x2)

UNIT - I

II. Discuss the need and significance of Moore and Mealy machines. How Moore machine differs from Mealy machine? Explain. (10)

III. a) Write the regular expression for L= $\{a^n b^m |$ where n+m is even$\}$over$\Sigma = \{a, b\}$

b) How a finite automata equivalent to a regular expression can be constructed? Explain. (2x5)

IV. Write short notes on the following:

a) Equivalence of NDFA and DFA

b) Equivalence of two regular expressions (2x5)

UNIT - II

V. What do you mean by 'Normal Form' in Context Free Grammar? List and explain various Normal Forms for Context Free Grammar by considering suitable examples. (10)

VI. Design a PDA for L = $\{0^n 1^{2n} \mid n \geq 0\}$ over$\Sigma = \{0,1\}$. (10)

VII. Write short Write short notes on the following:

a) Turing Machine with stationary Head

b) Derivation Trees (2x5)

x-x-x