Exam.Code:0461
Sub. Code: 3619

2021
M.Sc. Information Technology
Third Semester
MS-69: Theory of Computation

Time allowed: 3 Hours | Max. Marks: 80

***NOTE**: Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I – IV.*

x-x-x

UNIT – I

I. a) Discuss conversion Mealy to Moore machine with an example.
b) Discuss language, grammar and string in automata. (2x8)

II. a) Discuss minimization of DFA with an example.
b) Discuss DFA and NDFA with suitable examples. (2x8)

UNIT – II

III. Write short notes on:-
a) Equivalence of two finite automata
b) Equivalence of two regular expressions (2x8)

IV. Discuss closure properties of regular sets and Arden theorem. (8+8)

UNIT – III

V. a) Discuss pumping lemma for context free languages.
b) Discuss CYK with an example. (2x8)

VI. a) Discuss PDA in detail with suitable examples.
b) Differentiate between CNF and GNF. (2x8)

UNIT – IV

VII. a) Design turing machine for an odd length palindrome.
b) Discuss post correspondence problem. (10,6)

VIII. a) Design turing machine for square of a number.
b) Write short note on closure properties of languages. (10,6)

P.T.O.

UNIT – V

IX. Attempt the following:-

a) Define Chomsky classification of languages.

b) Prove: if L_1 and L_2 are two regular languages, then $L_1 \cap L_2$ is regular or not?

c) Define pumping lemma for context free languages.

d) Discuss universal turing machine (4x4)

x-x-x