

END TERM EXAMINATION

FIFTH SEMESTER [B.TECH./M.TECH.] DECEMBER 2014-JANUARY-2015

Paper Code: IT301

Subject: Theory of Computation

Time : 3 Hours

Maximum Marks :60

Note: Attempt any five questions including Q.no.1 which is compulsory.

- Q1 (a) Discuss the applications of regular expressions.
(b) With the help of examples define Pumping lemma.
(c) Explain the disadvantages of ambiguous grammar.
(d) Define halting problem.
(e) Differentiate between NP complete and NP hard problem. (4x5=20)
- Q2 (a) Explain Chomsky classification using example for each classification.(5)
(b) Discuss the steps to convert a NFA to DFA. Provide example to support the steps. (5)
- Q3 (a) Discuss the closure properties of CFL. (5)
(b) Differentiate between LL(1) and LL(2) grammar. Provide example for both LL(1) and LL(2) grammar. (5)
- Q4 (a) Differentiate between Push down automata and Turing machine. (5)
(b) Verify that the language $L = \{w \in a^n b^n c^{2n}\}$ is context free or not. (5)
- Q5 Define Decidability. What are the factors to determine the decidability? How does turing machine helpful for decidability? Explain using an example. (10)
- Q6 (a) Define hierarchy theorem. Explain using an example. (5)
(b) Discuss and explain the various complexity classes. (5)
- Q7 Construct the regular expression for the following languages:- (5x2=10)
(a) Language that accepts exactly one combination of 0 and 1.
(b) Language that accepts any number of 1s at the starting of the language.
- Q8 Write short notes on any two of the following:- (5x2=10)
(a) Recursion Theorem
(b) Non-deterministic turing machine
(c) Interactive proof systems

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400