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End User Computing Theory Exam Paper

Reg. No.:

Question Paper Code: 27173

E.E./B.Tech. DEGREE EXAMINATION, NOVEMBER / DECEMBER 2015

Fifth Semester
Computer Science and Engineering
CS6803 THEORY OF COMPUTATION
(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL Questions.
Part A – (10 × 2 = 20 marks)

1. What is finite automaton?
2. Write a Regular Expression for the set of strings over {0, 1} that have at least one 0.
3. Let G be a grammar with
 $S \rightarrow aBBA$,
 $A \rightarrow aBBA$,
 $B \rightarrow aBBA$.
for the string $aaabbbbbb$, find the left most derivation.
4. Construct the context free grammar representing the set of palindromes over $\{0,1\}^*$.
5. What are the different ways of language acceptance by a PDA and define them?
6. Convert the following CFG into a PDA.
 $S \rightarrow aAA, A \rightarrow aSNa$
7. Define a Turing Machine.
8. What is a multi-tape Turing machine?
9. State when a problem is said to be decidable and give an example of an undecidable problem.
10. What is a universal language L_u .

Part B – (5 × 16 = 80 marks)

11. (a) (i) Prove that "A language L is accepted by some DFA if and only if L is accepted by some NFA". (10)
(ii) Construct Finite Automata equivalent to the regular expression $(ab+ba)^*$. (6)
Or
(b) (i) Consider the following ϵ -NFA for an identifier. Consider the ϵ -closure of each state and find it's equivalent DFA. (10)

(ii) State the pumping lemma for Regular languages. Show that the set $L = \{0^i 1^i \mid i \geq 1\}$ is not regular. (6)