

B.E. / B.Tech. 4th Semester (CSE) E - Scheme

Examination-May-2014

THEORY OF AUTOMATA & COMPUTATION

Paper-CSE-206-E

Time allowed : 3 hours

[Maximum marks

:100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any five questions. All questions carry equal marks.

1. What do you mean by PDA ? How it works ? Explain ID for PDA. construct a PDA accepting $L = \{w \in \{a,b\}^* \mid \text{the number of } a\text{'s in } w \text{ equal the number of } b\text{'s in } w\}$ by final state.
2. (a) Design a turing machine M to recognize the language $\{1^n 2^n 3^n \mid n \geq 1\}$
(b) Discuss the post correspondence problem.
3. (a) Difference between context free and context sensitive Grammar.

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(b) Reduce the following CFG to GNF S $\rightarrow ABb \mid a$,
 $A \rightarrow aaA$, $B \rightarrow bAb$.

- (b) Prove pumping Lemma for regular sets. What are application of Pumping Lemma ?
5. (a) What is the difference between MEALY and MOORE machine ? What is the procedure for transforming a MOORE machine into MEALY machine.
- (b) What is Arden's method ? How to convert NFA to DFA by using Arden's method.
6. What is primitive recursive function ? Explain Prove that the following functions are primitive recursive.
(i) Concatenation (ii) Transpose (iii) Identity.
7. Write and briefly explain the characteristics of each class of grammar classified according to Chowmsky Hierarchy determine the type of the grammar G.
- (i) $S \rightarrow aA, A \rightarrow aAB, B \rightarrow b, A \rightarrow a$
- (ii) $S \rightarrow aAB, AB \rightarrow C, A \rightarrow b, B \rightarrow AB$
8. (a) Construct a DFA with reduced state equivalent to the regular expression $10+(0+11)0^*1$.
- (b) "Let be a set accepted by a non-deterministic finite Automation then there exists a deterministic finite automation that accepts L." Prove it.