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Roll No. .....

24786

B. Tech. 6th Semester (CS&IT)

Examination – May, 2014

THEORY OF AUTOMATA AND COMPUTATION

Paper : CSE-206-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, 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 : Question No. **1** is ***compulsory*** and attempt ***one*** question from each Section. All questions carry equal marks.

1. (a) What are the limitations of FSM.

(b) How to remove useless symbols from a CFG.

(c) Explain PCP problem.

(d) What are primitive recursive functions ?

SECTION – A

2. Define Moore and Mealy machines. Design Moore and Mealy machine to get 1st complement of the given binary number.

3. Construct FA corresponding to RE.

(i) (ab+c*)*b

(ii) a+bb+bab*a

(iii) a*+(ab+a)*

(iv) (a+b)*ab

SECTION – B

4. Discuss the closure properties of regular sets under union, closure and transpose.

5. Convert the following grammar to GNF form

E–>E+T/T

T–>T*F/F

F–>(E)/a

SECTION – C

6. What are the applications of PDA. Construct a PDA for $\{a^n b^m a^n \mid m,n >=1\}$

7. Construct a TM for $\{1^n 2^n 3^n \mid n>=1\}$

SECTION – D

8. (a) Explain Chomskey hierarchy of grammars.

(b) Find the highest type number which can be applied to following grammar.

(i) S->A0

A->0/B0

B->011

(ii) S->ASB10

A->0A/1

9. (a) Prove that a language is recursive if and only if its complement is recursively enumerable.

(b) show that following functions are primitive recursive.

(i) f(x,y)=x+y

(ii) f(x,y)=x*y